



Saesha Saha

Abstract

This study assessed the impact of schizophrenic progression on art styles of schizophrenic artists. The method approached in this study was content analysis with two categories coded for: color usage and abstract level. Color usage was further divided into three categories: warm color usage, cool color usage, and black, gray and white color usage. Abstract level was divided into three levels with level 1 as the least abstract and level 3 as the most abstract. To analyze full schizophrenic progression, deceased artists Louis Wain, Edvard Munch, Richard Dadd and Vincent Van Gogh were used. Each artist had three paintings, and therefore, a total of twelve paintings were coded for. With schizophrenia progression, three out of the four artists had an increased abstract level. No artist demonstrated a trend with color usage as their schizophrenia progressed. This showed that as schizophrenia progressed, abstract level increased. However, the progression of schizophrenia did not impact color usage. Rather, color usage depended on what was being depicted in the painting. Theoretical implications were discussed.

Key Words: Schizophrenia, Color Usage, Abstract Level

INTRODUCTION

Schizophrenia stands as one of the most intricate and enigmatic brain disorders, surrounded by a dearth of definitive understanding. However, research has shown the disorder's correlation with the activation of certain brain structures, such as the precuneus, which is located in the parietal lobe. Notably, as found by Mashal, who possesses a PhD in brain research, and her team of researchers, individuals with schizophrenia exhibit a heightened activation in the right precuneus compared to their healthy counterparts. (Mashal et al., 2014). An augmented activation of the precuneus was also correlated with elevated creativity levels. Prior research suggests that the higher the level of creativity in a patient, the more difficult it was for those participants to deactivate their precuneus (Takeuchi et al., 2010). This result was supported by Susan Whitfield-Gabrieli, a neuroscientist and professor of psychology at MIT, and her team, who found that patients with early schizophrenia demonstrated a similar inability to suppress their precuneus during cognitive activity (Whitfield-Gabrieli et al., 2009). The precuneus, responsible for mental imagery, information integration, and environmental perception, emerges as a common denominator in both schizophrenic and creative individuals, suggesting a correlation between creativity and schizophrenia.

The question that then naturally arises is whether or not schizophrenic individuals demonstrate high levels of creativity? Before delving deeper, the term creativity must be defined. According to Kaufman, an American psychologist, and his team of researchers, creativity can be defined as "the generation of ideas popping into conscious thought and the selection of ideas to be explored" (Kaufman et al., 2014). Yet, the challenge lies in quantifying one's conscious

thought. Given the abstract nature of creativity, a novel approach is required to scrutinize the correlation between individuals exhibiting creativity and those grappling with schizophrenia.



Prior studies have demonstrated a correlation between creativity and art. One such study was aimed to find differences in the level of creativity demonstrated in art majors versus non-art majors. Their findings showcased that art majors had a higher level of creativity than the non-art majors (Xurui et al., 2018). As a result of this correlation, it is possible that creativity could be measured through the analysis of different pieces of art. This method has been applied to a study which demonstrated that having participants perform abstract art provides an alternate method to measure creativity level (Bellaiche et al., 2023). Based on the correlation between schizophrenia and creativity, as well as creativity and art, this research endeavor focused on the impact of schizophrenia on art style. As the study performed by Bellaiche, who has earned a PhD in psychology and neuroscience, and their team of researchers found, abstract level can be used as a measure of creativity, therefore this study will analyze schizophrenia's impact on art style through changes in abstract level. Additionally, changes in color usage will also be used to address differences in art style with schizophrenic progression. This will be further described in the methodology section.

LITERATURE REVIEW

Upon further research, I discovered that the creation of art, in the form of art therapy, had a positive impact on schizophrenia. Robert Marrow, an MD holder at Thomas Jefferson University, performed a case study on a schizophrenic patient to reveal the impact of art therapy on schizophrenia. It was displayed that the progression of art therapy benefited the patient as he became more calm and started caring for personal hygiene (Marrow, 1985). I realized that

although there was research present on art's impact on schizophrenia, such as the case study performed by Marrow, there was a lack of research present on schizophrenia's impact on art. This seemed to be intriguing as there was a correlation between schizophrenia and high creativity levels, and creativity has an influence on one's art style. In truth, there were only a couple studies focusing on this correlation, as described in the following section.

Art Style and Current Schizophrenic Artists

This section presents a review of recent literature reporting the correlation between schizophrenia and art style of artists with this illness. Current 94-year old schizophrenic artist, Yayoi Kusama, uses her hallucinations, consisting of flashing lights and fields of dots, to create her sculptures and paintings. (Suma et al., 2018). Furthermore, a recent study by Hui Shen, with a PhD in cellular biology, and their team of researchers, concluded that relative to healthy individuals, schizophrenic patients had decreased color usage and different brush strokes (Shen et al., 2021).

Gap in the Research

However, a closer look to this literature reveals a major shortcoming. The discussion of the relationship between schizophrenia and art is only showcased for currently living artists. This presents a gap in the literature as the full progression of schizophrenia is not analyzed because the artists are still living. To fill this literature gap, this paper identifies the impact of schizophrenia on art styles of schizophrenic artists from the mid 1800s to early 1900s, allowing to discern the full progression of the schizophrenia. Moreover, past studies have dissected the art pieces of an individual schizophrenic artist. For example, schizophrenic artist, Edvard Munch, incorporated his psychological state into his paintings. In one such painting, *The Scream*, Munch painted a sunset that he saw from his perspective, where it was as if nature was screaming at him (Azeem, 2018). In another paper, the schizophrenic artist Louis Wain has



their artwork evaluated by Damiani, from the Department of Brain and Behavioral Sciences at the University of Pennsylvania, and his team of researchers. The literature reviews the unique art techniques of Wain to that of other artists, thereby representing the different perceptual set in Wain's mind (Damiani et al., 2018). Although this body of knowledge evaluates the art of a schizophrenic artist from the 19th century, we argue that previous literature suffers from certain weaknesses: it does not look at changes in art style as the schizophrenia progressed and multiple schizophrenic artists are not evaluated. The question that then becomes the best to define is how does the

progression of schizophrenia correlate with changes in the art styles of artists with this illness?

To answer this question and fill the literature gap, this paper utilizes content analysis on art pieces of four schizophrenic artists from the 1800s. Research conducted from this question offers valuable insight at the intersection of neuroscience and art history, contributing to a better understanding of the neural mechanisms affecting artistic expression, and the relationship between mental health and artistic abilities. Additionally, such research allows the art community to gain a further understanding of the art presented by schizophrenic artists through the unraveling of the complexities of creativity. Furthermore, this research endeavor can potentially address misconceptions about schizophrenia individuals, fostering a more inclusive and compassionate community. The chosen method for this research is content analysis, a strategic approach that enables a comprehensive examination of the specific elements within the paintings of schizophrenic artists. This method holds the promise of unveiling discernible patterns and differences in color usage and abstract levels, providing a tangible means to document the dynamic changes in the artists' expression over the course of their schizophrenic journey. Given the established correlation between schizophrenia and art through creativity, the hypothesis guiding this study posits that the progression of schizophrenia will correlate with changes in color usage and abstract level in the schizophrenic artists. In the forthcoming methods section, information on the study design will be provided.

RESEARCH DESIGN AND METHODOLOGY

Study Design

For this research, I utilized a qualitative approach approved by the Ethics Review Committee (ERC). Qualitative methods offered an effective way to hypothesize conclusions for possible differences in art style. The goal is to assess if schizophrenic progression contributes to changes in art style, which is a measure of creativity. This is important because prior research demonstrates that high creativity, and schizophrenia have similar brain activation, suggesting a correlation. It was decided that the best method to adopt for this investigation was the content analysis method. A major advantage of the content analysis research method was that it allowed observations of specific patterns in the data. As this research identified changes in art style of each of the four schizophrenic artists as their schizophrenia developed, content analysis was an effective research method to utilize in order to draw conclusions from the qualitative data. Prior researchers followed a similar route as described below.

This study and metric is modeled after research performed by Hui Shen, a researcher at the Shanghai Key Laboratory of Psychotic Disorders, and her team. Their paper, *Color painting predicts clinical symptoms in chronic schizophrenia patients via deep learning*, analyzed the paintings colored by 281 chronic schizophrenia patients and 35 healthy patients. Through content analysis, the researchers compared the differences in art style of the schizophrenic



patients and the healthy controls. They determined these differences by assorting the variables into two

categories: brush stroke and color usage. I adopted the category of color usage to code for during the research journey. However, despite the initial plan, I was ultimately not able to adopt the category of brush stroke as I could not see the actual brush strokes on online paintings. To address this challenge, a new category had to be adopted in replacement of the brush stroke. The new category was modeled after Bellaiche and their team of researchers. Their study demonstrated that abstract level could be used as an index for visual creativity (Bellaiche et al., 2023). As schizophrenia and creativity have a correlation, and Bellaiche's study demonstrated success, abstract level was the category adopted in replacement of brush stroke.

Ethics

Prior to undertaking this investigation, ethical clearance was sought from the ERC. The procedures of my research were approved without any modifications as there were no ethical problems present. Additionally, the exclusion of the involvement of human participants simplified the approval process as my methodology focused on secondary research from the internet and coding art style changes. Additionally, my research complies with ethical practices. Throughout the research process, honesty was practiced. The data was not manipulated, and the reporting of the data was truthful. The practice of prudence and objectivity was essential to my research process and was practiced. By strictly following the code book created when collecting the data, careless errors and omissions were avoided, thereby aligning with the ethical principles.

Sample Selection

The initial step of my research process was to determine the artists analyzed. As the research addresses the impact of schizophrenia on art style, it was necessary to examine the full progression of schizophrenia. Therefore, it was necessary to choose artists that have passed away. Upon searching on Google which deceased artists were believed to have schizophrenia, it was determined to analyze the art of the following schizophrenic artists: Louis Wain, Edvard Munch, Richard Dadd, and Vincent Van Gogh. The following step of my research process was to determine the certain time frames the three art pieces for each artist would be from. It was decided that to have the best analysis of the content, one art piece would be created before the development of schizophrenia, the second piece would be created during the onset of their schizophrenia development, and the third piece would be created near the artist's death or when their schizophrenia was further developed. This was imperative so that art style changes could be compared with the progression of the artist's schizophrenia. With respect to this, I elected the time frames for each of the three art pieces. Following are the listed time frames for each schizophrenic artist's three art pieces. The first time frame represents the piece from before the schizophrenia development, the second time frame represents the piece from the initial onset of schizophrenia, and the third time frame represents the art piece from the later progression of the schizophrenia. [Edvard Munch: 1876-1890, 1891-1920, 1921-1944; Louis Wain: 1881-1895, 1895-1920, 1921-1939; Richard Dadd: 1837-1852, 1852-1866, 1867-1886; Vincent Van Gogh: 1880-1883, 1884-1887, 1888-1890]. Gogh's time frames were shorter than the other artists as his art career lasted only a few years before he passed away in 1890. Once this was finalized, the succeeding step was the selection of my data. I created a list of the art pieces that were available for free to view on Google for each of the four artists. Subsequently, another instrument I utilized as a tool to conduct my experiment was a randomized generator



(<https://wheelofnames.com/>) to select the three art pieces for each artist. This was done to avoid selection bias when choosing the art pieces. The art pieces analyzed for each artist is the following: Louis Wain: *A Kitten's Christmas Party (1886)*, *Globe Polish (1910)*, *Kaleidoscope Cat 6 (Unknown Date)*; Edvard Munch: *Morning (1884)*, *The Scream (1893)*, *The Gothic Girl (1924)*; Richard Dadd: *The Flight out of Egypt (1850)*, *Fish Market by the Sea (1860)*, *Landscape with Cottages, Broadmoor (1873)*; Vincent Van Gogh: *Dunes (1882)*, *Old Church Tower at Nuenen (1885)*, *The Starry Night (1889)*. The date for Wain's third art piece is unknown. However, it is believed that any of the Kaleidoscope cats created by Wain were created near the end of schizophrenic progression.

Procedures

The data was accessible free of charge on the search engine, Google. The art pieces were analyzed based on the selected series of coding categories. As previously mentioned, I adopted the two categories of color usage and abstract level. I narrowed these two categories into micro categories. For color usage, the micro categories were the following: usage of warm colors (01), usage of cool colors (02), and usage of black, white and gray (03). Abstract level was divided into three levels: one, two and three. Level 1 abstract level (04) was the least abstract and was defined as painting was clearly defined and depiction could be seen in real life; level 2 abstract level (05) was defined as depiction in painting was not clearly defined, but could be seen in real life; level 3 abstract level (06) was the most abstract and was defined as depiction in painting was not clearly defined and could not be seen in real life.

These micro categories were necessary because the term color and abstract level is very broad as there are many different colors and abstract levels to identify. Therefore, I narrowed the category of color and abstract level down to better identify changes during the analysis process. These six categories were repeated for each of the four artists, resulting in a total of twenty-four codes. The codes for the six categories were labeled with the initials of the artist followed by the corresponding code category number (1-6). For example, EM-01 represents where Edvard Munch used warm colors in his art as his schizophrenia progressed. Throughout the coding process, I referred to this rich codebook so that the research process would be systematic and structured, allowing the codebook to be valid. To track the data, the results of the data were documented on a Google spreadsheet that I created (Table 1). It is formatted with four columns: the artist, the three art pieces analyzed for that artist, the category analyzed (either one of the six micro categories of color usage or abstract level), the code name itself, and a short description to further detail what was found in the painting.

Table 1

Artist	The Art Piece	Category	Code Found	Description
Ex: Edvard Munch	The Scream (1893)	Color Usage	EM-01	Just an example.
Louis Wain	A Kitten's Christmas Party (1886)	Color Usage	LW-03	Cats shown in black, white, and a little grey
Louis Wain	A Kitten's Christmas Party (1886)	Color Usage	LW-01	Only slightly, a pale lemon yellow color was used
Louis Wain	A Kitten's Christmas Party (1886)	Abstract Level	LW-04	Some parts realistic, ex: two cats standing next to each other in front of a sofa
Louis Wain	A Kitten's Christmas Party (1886)	Abstract Level	LW-05	Other parts of the painting have clarity but is unrealistic; ex: cats seated at a dining room

Data Analysis

Upon the completion of labeling the art pieces with codes, the data analysis process began. During the data analysis process, the three art pieces for each artist were compared using the codes, and overall trends and patterns were identified. For example, as their schizophrenia progressed, did an artist's art style become more incorporated with cool colors and less with warm colors, or possibly, the opposite held true? These are possible



patterns that could be identified for one or more of the schizophrenic artists. Succeeding the determination of possible art style changes for each artist through the utilization of the codes, the patterns for each artist must be compared and contrasted between the four artists. For instance, was there more than one artist that showcased a similar pattern in their change in art style? Comparing and contrasting the trends analyzed in each artist allowed the formation of conclusions and found answers to the research question.

Limitations

In this investigation, there are several sources of error. The main error behind this study is that while the current scientific community believes that the four artists analyzed may have had schizophrenia, there is no official diagnosis to confirm this due to the limited scientific knowledge at that time. Due to this, researchers can only estimate when the artists' schizophrenia developed based on recorded behaviors the artists demonstrated. This acknowledgement underscores the importance of interpreting the findings with caution, yet the inherent value lies in the unique lens through which content analysis provides for the exploration of changes in art styles of the artists, despite the historical diagnostic challenges. Another major source of uncertainty was that it was impossible to differentiate what part of the art style was due to an artist's personal likings and what was due to the progression of schizophrenia. However, even if there was no method to confirm this, if the art style changes lined up with the progression of the artist's schizophrenia, the schizophrenia causing this change was a plausible explanation.

Results

The results of this research endeavor aims to answer the research question: How does the progression of schizophrenia correlate with changes in art style of schizophrenic artists? To answer this question, the method of content analysis was utilized. Three paintings for each of four schizophrenic artists, Louis Wain, Edvard Munch, Richard Dadd and Vincent Van Gogh, were coded for.

The three of Wain's paintings coded for were *A Kitten's Christmas party (1886)*, *Globe Polish (1910)*, and *Kaleidoscope Cat 6 (unknown date)*. The three of Munch's paintings coded for were *Morning (1884)*, *The Scream (1893)*, and *The Gothic Girl (1924)*. The three of Dadd's paintings coded for were *the Flight out of Egypt (1850)*, *Fish Market by the Sea (1860)*, and *Landscape with Cottages, Broadmoor (1873)*. The three of Gogh's paintings coded for were *Dunes (1882)*, *Old Church Tower at Nuenen (1885)*, and *The Starry Night (1889)*. Gogh possessed only a 10 year art career span and therefore the difference between the years of the art pieces created are smaller than the other artists coded for. However, Gogh's schizophrenia did not develop until after he became an artist, so the full schizophrenic progression could still be analyzed.

Color usage was coded through warm colors usage, cool colors usage, and usage of black, white and/ or gray. Abstract level was divided into three levels. The first level was defined as little abstraction, with the depiction in the paintings being defined (viewers can make out what was shown in the painting) and realistic, as in that the painting depictions could be recreated in the real world. The second level was defined as somewhat abstract, with the depictions in the paintings being defined, but not likely to be portrayed in real life. The third level was defined as very abstract, with the depictions in the painting not being defined and not likely to be portrayed in real life. Each painting was coded from a different year for each artist, with a few years in

between the creation of each painting. The gap between the different years the painting was created was to demonstrate the schizophrenic progression.

Previous data utilized inkblots and asked participants what they saw in those ten inkblots. Researchers found that schizophrenic individuals tended to see different images in the inkblots than other healthy participants. These results indicated that schizophrenic individuals may display a different art style than healthy individuals. (Lejsted et al., 2006). Furthermore, previous research conducted on schizophrenic artists found that schizophrenic individuals tended to use less color than their healthy counterparts (Shen et al., 2021). However, the results of this endeavor indicated that the progression of schizophrenia did not exhibit a correlation with color usage, but rather schizophrenic progression may relate to a correlation with abstract level.

The first artist coded for was Louis Wain. Figure 1 depicts the color usage and abstract level of Wain found.

Figure 1

Louis Wain	Warm Colors	Cool Colors	Black, gray and white	Abstract Level
<i>A Kitten's Christmas Party (1886)</i>	Present	Not present	Present	2
<i>Globe Polish (1910)</i>	Present	Present	Present	2
<i>Kaleidoscope Cat 6 (exact year unknown)*</i>	Present	Present	Not present	3

*Although the exact year of the creation of the Kaleidoscope Cat 6 painting was unknown, it was believed to be created after *Globe Polish*.

The results indicated the following: Wain's schizophrenic progression connotated a correlation with his abstract level as the level of abstraction increases. The usage of warm colors stayed the same as it was present in all three of Wain's paintings that were coded. However, Wain's usage of cool colors increased with schizophrenic progression. On the contrary, the usage of black, gray and white decreased.

Figure 2 depicts the color usage and abstract level of each of Edvard Munch's three paintings that were coded for.

Figure 2

Edvard Munch	Warm Colors	Cool Colors	Black, gray, white	Abstract Level
<i>Morning (1884)</i>	Present	Present	Not present	1
<i>The Scream (1893)</i>	Present	Present	Not present	2

<i>The Gothic Girl (1924)</i>	Not present	Present	Present	2
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As Edvard Munch’s schizophrenia progressed, there was a correlation of an increase in his abstract level. Additionally, Munch’s usage of black, gray and white colors increased. Conversely, the usage of cool colors stayed the same and the usage of warm colors increased.

Figure 3 exemplifies the color usage and abstract level of Richard Dadd’s three paintings that were coded.

Figure 3

Richard Dadd	Warm colors	Cool colors	Black, gray, white	Abstract Level
<i>The Flight out of Egypt (1850)</i>	Present	Present	Not present	1
<i>Fish Market by the Sea (1860)</i>	Present	Present	Not present	1
<i>Landscape with Cottages, Broadmoor (1873)</i>	Present	Present	Not present	1

Contrary to the previous artists, Dadd’s abstract level stayed the same. Furthermore, his usage of warm and cool colors stayed the same. Dadd did not use black, gray or white in the three paintings coded for.

Figure 4 exhibits the color usage and abstract level of Vincent Van Gogh’s three paintings that were coded.

Figure 4

Vincent Van Gogh	Warm colors	Cool colors	Black, gray, white	Abstract Level
<i>Dunes (1882)</i>	Present	Present	Not present	1
<i>Old Church Tower at Nuenen (1885)</i>	Present	Present	Present	1
<i>The Starry Night (1889)</i>	Present	Present	Present	2



As his schizophrenia progressed, there was a correlation of an increase of Gogh's abstract level and usage of black, gray and white. However, the usage of warm and cool colors remained the same.

Discussion

The study discussed in the research paper set out with the aim of finding a correlation between schizophrenic progression and color usage and abstract level. Content analysis is used to code for the paintings in order to analyze changes or consistencies in color usage and abstract level throughout all the schizophrenic artists. The results indicate that three out of the four artists demonstrated increased abstract level as their schizophrenia progressed overtime. However, one unanticipated finding is the exception of Richard Dadd, who demonstrated a consistent rather than increased abstract level with his schizophrenic progression. It is difficult to explain this outlier, but it might be related to the fact that Dadd's paintings consisted of variations, even during his late schizophrenic stages. For example, although Dadd created realistic paintings such as landscapes and still lifes years before death, he also created paintings based off of his imagination, such as the painting *The Fairy Feller's Master Stroke* (Bell 2017). Paintings based off of his imagination would likely show an increased abstract level. However, as the selection of the paintings in this research endeavor were through a randomized generator, the paintings based off of his imagination were not chosen.

Despite the outlier, the finding of increased abstract level with schizophrenic progression mirrors those of previous studies that examined the effect of schizophrenia on brain development, particularly the precuneus. As discussed in the literature review, schizophrenic development is correlated with increased activation of the precuneus (Mashal et al., 2014). The precuneus is a brain structure associated with perception through the integration of information from internal and external environments (Peer et al., 2015). As schizophrenia affects the activation of the precuneus, the perception of the environment of schizophrenic individuals may differ from healthy individuals. The studied schizophrenic artists painted what their minds saw in the world. Therefore, the result of an increase in abstract level as the schizophrenia progresses indicates a change in perception. The change in perception supports previous studies of schizophrenia's impact on the precuneus.

Contrary to expectations, the study does not demonstrate a significant correlation between the progression of schizophrenia and color usage. The case is true for all the color usage categories coded for: warm color usage, cool color usage and usage of black, gray and white colors. Each artist demonstrated a different pattern of color usage. For example, with warm color usage, Wain's, Gogh's and Dadd's usage stayed the same, while Munch's usage increased. While Munch may seem an outlier in the warm color usage, the results of the cool color usage contradicts the preceding statement. In the usage of cool colors, Munch's, Gogh's and Dadd's usage stayed the same, while Wain's increased. As there were no overall patterns or trends found for the color usage, it is likely the color usage was dependent on the depiction of the painting rather than the progression of the schizophrenia. The findings of the current study do not support the previous research which found that schizophrenic individuals tended to use less color than their healthy counterparts (Shen et al., 2021). However, there is a difference between the schizophrenic artists coded for in this study and the schizophrenic participants in Shen's study: the participants in Shen's study received treatment for their schizophrenia. On the contrary, as the artists analyzed in the study were from the 1800s, they did not receive proper treatments for their schizophrenia as the medical community was not as advanced at that time



as it is today. Although the previous conclusion cannot be proven, it does serve as a plausible explanation as to why the findings of the study in question differed with Shen's study.

The finding of the correlation between schizophrenic progression and increased abstract level exemplifies important implications for developing a better understanding of the art presented by schizophrenic individuals before proper treatment was developed. These findings can be taken into account by art historians which can potentially lead to new perspectives on the interpretation of the works of schizophrenic artists. Furthermore, as reviewed in the literature section, with the correlation between schizophrenia and the precuneus and creativity, these findings may help us recognize the relationship between creative processes and mental health. Understanding the influence of schizophrenia progression on artistic expression can deepen the comprehension of the disorder's impact on cognition and perception.

On the contrary, the findings on schizophrenia progression and its lack of correlation with color usage are rather disappointing. The results of the color usage aspect of the study do not contribute to any possible explanation of the relationship between creativity and schizophrenia. As mentioned previously, the lack of treatment available for the schizophrenic artists coded for in the study of the research paper could serve as a reason for why schizophrenic progression did not impact color usage. A further study with more focus on past schizophrenic artists and their color usage is therefore recommended.

Conclusion

Our results on the correlation between the progression of schizophrenia and increased abstract level are broadly consistent with studies on the correlation between schizophrenia and the precuneus (Mashal et al., 2014) and creativity and the precuneus (Taekuchi et al., 2010). Both schizophrenia and creativity demonstrate an increased activation of the precuneus, an area of the brain responsible for environmental perception. Altered environmental perception can be shown through the level of abstraction the schizophrenic artists painted of ordinary objects. Therefore, increased abstract level with schizophrenic progression implied an affected precuneus. However, it is difficult to arrive at any conclusions with regard to color usage and schizophrenia. The study demonstrated that schizophrenic progression did not have an impact on color usage in the artists that were analyzed. It seems that the color usage in each painting was rather dependent on the contents of the painting and had no correlation with schizophrenic progression. This contradicted a prior study which found that schizophrenic individuals demonstrated increased color usage than their healthy counterparts (Shen et al., 2021). However, Shen compared the color usage of schizophrenic individuals to healthy individuals whereas the method of the conducted study focused on schizophrenic individuals. Therefore, a topic of considerable interest for future research endeavors would be to compare the color usage of deceased schizophrenic artists with deceased healthy artists from the same time period.

Limitations

Despite the implications, the findings of this study have to be seen in light of three major limitations. First, there was a lack of previous research directly analyzing the relationship between schizophrenia and art style. Due to a multitude of previous studies about the correlation between schizophrenia and the precuneus and about the correlation between the precuneus and creativity, this study aimed to see if schizophrenia correlated with art style changes. To our knowledge, the study analyzed in the research paper is one of the few reports analyzing the direct correlation between schizophrenic progression and art style.



To analyze the full schizophrenic progression, deceased schizophrenic artists from the 1800s recognized. However, due to the lack of advancements in the scientific field at that time, there is no official diagnosis that the studied schizophrenic artists developed schizophrenia. There only exists predictions in which the current scientific community believes that the studied artists had schizophrenia based on records of the behaviors they demonstrated. However, there exists no confirmation of this diagnosis.

The third limitation concerns the sample size of the study. Due to time constraints, only four schizophrenic artists were studied. Although the four schizophrenic artists studied meet the scope of the study, due to the small sample size, the patterns found in art style for these four schizophrenic artists cannot account for all schizophrenic artists. A sample size of four artists cannot encapsulate all the varieties in art style that different artists may have.

Areas for Future Research

This study's limitations are catalysts for future research endeavors. To begin, future research could further investigate the direct correlation between schizophrenic progression and art style as very little research exists on the relationship. Furthermore, future studies could fruitfully explore the art style of schizophrenic artists with confirmed schizophrenia through a case study of schizophrenic artists who were officially diagnosed. In addition, a larger sample size might prove an important change for future research as a larger sample size would allow a better representation of the overall population of schizophrenic artists, and may possibly lead to different results than found in this study.



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