

Ethical Implications of Inconclusive Scientific Research on Schizophrenia

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Abstract

Schizophrenia leads to distorted perceptions of reality and irrational beliefs. It is the ninth leading cause of disability worldwide, however its etiology is unknown. The Dopamine Hypothesis of Schizophrenia (DHS), developed in the 1950s, postulates that increased dopamine in the brain causes schizophrenia. Despite its poor empirical track record, DHS has been widely accepted. This paper investigates why DHS persisted without sufficient evidence and addresses the ethical implications of such persistence to clinical treatment. I provide an overview of the scientific research on the DHS, emphasizing its lack of validity. Next, I determine that the DHS is not a genuine scientific theory, because it is too vague to be tested and has never been challenged by an alternative explanation. Then I argue that the persistence of the DHS could be attributed to the dominating contextual values (background beliefs) at the time, such as the popularity of biology as a hard science, which outweighed cognitive values such as truth and validity. This persistence is ethically problematic when the lives of those with schizophrenia are considered. The treatment plans developed as a result of the DHS may cause more harm to patients due to a lack of complete understanding of the illness.

Keywords: Philosophy, Ethics, Psychiatry

1. Introduction

Schizophrenia is a mental illness that leads to distorted perceptions of reality and irrational beliefs. It is the ninth leading cause of disability worldwide, however its etiology is unknown.¹ The Dopamine Hypothesis of Schizophrenia (DHS) postulates that the increased presence of the brain chemical dopamine is the cause of the development of schizophrenia, however, the hypothesis has a poor empirical track record. Despite this, DHS has been widely accepted by researchers and even used as the basis for the treatment of patients with schizophrenia. In this essay, I argue that the DHS has persisted for over 60 years, in part due to the contextual (background) values that surrounded it during the time of its development. Such values include beliefs and personal values. These values outweighed cognitive values, such as truth and validity, allowing the lack of evidence for DHS to be overlooked. I also argue that treating patients as if the changes in their dopamine levels caused their illness is ethically problematic. Neither the short term nor the long-term consequences of disrupting neurotransmitter activity within the brain are known and, there is no proof that intervening on this activity will successfully treat schizophrenia. Thus, intervention strategies that aim to alter the dopamine levels pose more risks than benefits for patients.

1.1 Analysis of DHS

During the 1950s and 1960s, significant advances were made in brain research. In particular, two major discoveries took place that would culminate with the first development of the DHS. One of these discoveries was the function of the neurotransmitters dopamine, norepinephrine, and serotonin within the brain. It was discovered that these brain chemicals aided in communication between nerve cells and the brain. The second discovery was the finding of lower

levels of dopamine in the post-mortem brain of patients of Parkinson's disease. This would lead to the treatment of patients of Parkinson's disease with a dopamine supplement. These supplements were successful in reducing symptoms of Parkinson's disease. This time period was the beginning of the journey to understanding the human brain and it gave hope, as well as excitement, to psychiatrists and brain researchers.²

The DHS emerged, for the first time, shortly after these two brain-related discoveries had been made. DHS attributes the psychotic symptoms of schizophrenia, such as hallucinations, a result of changes in dopamine levels in the brain. Specifically, DHS postulates that dopamine levels are increased in the brains of patients with schizophrenia. Although this theory generally claims increased dopamine levels are the cause of schizophrenia, many different scientists developed variations of the theory. There was never a general consensus as to where the increased dopamine is located, whether it be in the brain as a whole or in certain areas, nor was there consensus on why there was increased dopamine levels, whether it be due to the increased secretion of dopamine or the increased sensitivity of dopamine receptors in the brain.³

DHS has been the prevalent etiological hypothesis for schizophrenia for over 60 years now. This hypothesis has not been scientifically verified because it is too vague to be tested. There was no one DHS, rather several associated hypotheses that fell under DHS. The only general consensus about dopamine in patients of schizophrenia is that higher levels of it exist within their brain. Where this increased dopamine level occurs and how it comes about was never agreed upon.⁴ Despite the scientific effort to validate this theory, even 60 years later empirical support is remains lacking. So long as multiple variations of a theory exist, it is nearly impossible to verify a theory, as scientists are performing different tests, using different methodologies, seeking different results.

This hypothesis is not only scientifically unsound because of its vagueness and inconsistency, but also because there is no direct evidence to support it. The theory does not precisely explain how an excess of dopamine levels leads to schizophrenia nor does it explain how and where this excess occurs. What drove further persistence of the theory was the use of recreational drugs. It was found that high doses of amphetamines, found in recreational drugs, could result in a schizophrenic-like psychosis in undiagnosed people. It should be noted that this psychosis was not a result of sleep deprivation. This evidence was seen as important because scientists used it to prove correlation. It was found at this time that people with schizophrenia did have higher levels of dopamine in the brain, but a major issue with the theory was proving this correlation was equal to causation. There was, indeed, a relationship between dopamine levels and schizophrenia, but there was no supporting evidence indicating that increased dopamine levels directly caused the illness. The finding that recreational drugs could create a schizophrenia-like psychosis was seen as the key to proving that the correlation was equal to causation. This was the evidence that researchers and scientists held as proof that high levels of dopamine in the brain could result in schizophrenia, although this evidence did not directly support anything about schizophrenia.⁵

2. Methodology

Philosophy of science also gives us tools to evaluate the scientific credibility of the DHS, as well as its existence despite the lack of such empirical credibility. From a philosophical standpoint, too, the theory faced challenges. Karl Popper firmly believed in the need for a theory to be falsifiable for it to be scientific. While Popper never wrote on the Dopamine Hypothesis of Schizophrenia, he did write about theories that had comparable problems to that of this one. Popper argued that Astrology, Freudian Psychoanalysis and Adler's Theory of Individual Psychology were all too vague to be falsified. In regards to astrology, take for example a statement such as "you have a great desire to be loved by people" as a characteristic of all Leos. This statement is much too vague to be tested and falsified due to its use of the word "great," as well as the underlying assumptions of this characteristic. The term "great" is too subjective to be measured in a scientific study. This statement implies that only Leos have a great need to feel loved by people, however if you looked into it, you would find that most people have the desire to feel loved by people. On a more complex level, Popper criticizes Adler's Individual Psychology and Freudian Psychoanalysis for their vagueness as well. Popper believed that each of the theories could find confirmations if they sought them out. Popper uses two situations to demonstrate this belief and incorporates both Psychoanalysis and Individual Psychology to explain these situations. The two situations Popper uses are a man allowing a child to drown and a man sacrificing his life to save the child. Popper says, "According to Freud, the first man suffered from repression (say, of some component of his Oedipus complex), while the second man achieved sublimation. According to Adler the first man suffered from feelings of inferiority (producing perhaps the need to prove to himself that he dared to commit some crime), and so did the second man (whose need was to prove himself that he dared to rescue the child)."⁶ The Dopamine Hypothesis of Schizophrenia is similar to these two in its vagueness. This theory pushes the excess levels of dopamine in the brains of schizophrenics, but it is not specific in the reasons for this excess. There is also no direct correlational

research that would prove this excess would lead a person to develop schizophrenia. When parts of this theory could not be proven, such as the area of the brain in which these excess levels of dopamine occur, scientists and psychiatrists looked for new ways to prove the theory correct, such as the excess levels occurring in the entire brain, rather than in a part of it.⁷ Karl Popper would say that because this theory is vague, it cannot be falsified, and, if it cannot be falsified, it cannot be scientific.⁸

Thomas Kuhn coined the term ‘paradigm’ to describe scientific knowledge at any one time. A paradigm shift would occur when normal science led to extraordinary science. Normal science can be defined as the everyday research and experimentation, also known as puzzle solving. The communal aspect of science was vital in Kuhn’s demarcation criteria of science: Kuhn believed that because science was done within communities, new theories could replace old ones. Kuhn believed that, when a group of scientists all uncovered similar problems in their testing of existing paradigms, or theories, new theories that are better tested could come about. This replacing of old theories with new ones was referred to as extraordinary science. For Kuhn, this paradigm shift is difficult to attain because scientists will be resistant to believing that their theory is wrong.⁹ Kuhn would have believed that the lack of a new and better theory would allow for the persistence of the Dopamine Hypothesis of Schizophrenia. Kuhn claimed that new theories and discoveries provided the challenges scientists needed for extraordinary science to occur. Without new theories to challenge the old, old theories will continue to persist, as there is no other explanation that could better explain a phenomenon.¹⁰

3. Theory

Now, we settled that neither scientifically, nor philosophically did the DHS offer a plausible explanation of schizophrenia. How do we then, explain the persistence of the DHS despite lack of empirical evidence? Why is it still highly regarded as a plausible account of the etiology of schizophrenia? This question could be illuminated, again, by using the resources of philosophy of science. This persistence may be attributed to the values that encouraged the development of this theory. Two different types of values influenced this theory: cognitive values and contextual values. Cognitive values involve truth of the scientific theory, its validity, and its reliability while contextual values involve norms, preferences, beliefs, and interests of the scientists conducting research and the communities they are a part of.¹¹ The first cognitive value that encouraged the development of the Dopamine Hypothesis of Schizophrenia is explanatory power. At this time, and even still, the actual etiology of schizophrenia is unknown. At a time when brain research was beginning to make advancements, scientists, specifically psychiatrists, had been seeking to enhance and develop their field of study. Finding the cause of schizophrenia and being able to explain how the illness comes about was a way in which psychiatry could enhance its own field. The findings on brain chemicals and their links to diseases, such as Parkinson’s disease, was the kind of information that psychiatry needed to begin uncovering truths about mental illness.

This brings to light the next two cognitive values that influenced the development and persistence of this theory. These two values are predictive power and truth. Predictive power has been and still is important to psychiatrists. Discovering the cause of schizophrenia would allow psychiatrists to better understand the illness. A better understanding of the illness would, in turn, result in the ability to predict the course of the illness. Knowing how an illness exists and how it is likely to progress can help to ensure that patients receive the treatment that they need. Both predictive and explanatory power have influenced the persistence of this theory because the theory provides psychiatry with a way to explain why schizophrenia occurs, even if it is a vague and incomplete explanation. Because psychiatry can, in some way, explain the illness, the ability to predict the course of the illness becomes more possible than ever before, also allowing this theory to persist.

Truth is the most important of all cognitive values and can be seen at work in the development of the Dopamine Hypothesis of Schizophrenia. Science, in general, seeks to find the truth about natural phenomena that take place in the world.¹² Discovering truths about the brain and mental illness has been and is still desired by psychiatrists because it leads to new types of treatment and, eventually, even cures. The Dopamine Hypothesis of Schizophrenia has been persistent because of this value in that it’s the closest science has come to discovering the actual cause of schizophrenia and, therefore, the closest it has come to finding an efficient treatment for it.

Contextual values, or norms, preferences, interests or beliefs, have also contributed to the persistence of the Dopamine Hypothesis of Schizophrenia.¹³ Within the field of psychiatry, a contextual value that many psychiatrists have approached their study with is the desire to move the skepticism about the scientific status of psychiatry. Psychiatry has always been as a legitimate form of science. Psychology was the last science to come out of philosophy and many of the questions of the human mind and behavior have been left unanswered. Psychiatrists approach their

field of study with an interest in proving the scientific status of their field. This interest is not an interest in finding the truth for the development of the field, but rather, an interest in finding the truth to prove that psychiatry and psychology are indeed sciences that deserve just as much credit as any other science. The Dopamine Hypothesis of Schizophrenia has persisted in conjunction with this value because psychiatrists saw DHS as a very big step towards a huge discovery—a discovery that would help put psychiatry on a par with other sciences such as chemistry and physics, and would reduce the skepticism and doubt of other scientists.

Another contextual value that hugely impacted the development and persistence of this theory is the norms of this time period. During the 1950s and 60s, when this theory first came about, mental health reform was taking place in the United States. Congress was beginning to pass laws, create departments specifically for the research of mental illness, and funding programs and treatment centers for the mentally ill. Mental illness was finally beginning to be recognized and addressed by the United States government during this time period. One can conclude that, if the government was addressing mental illness, there was more widespread acknowledgement of the mentally ill and the previous hardships they suffered due to a lack of research and services. This acknowledgement would, in turn, lead to new societal norms that accepted the mentally ill and an interest within society to help get these people the treatment that they rightfully deserve.¹⁴

This new interest in treating the mentally ill, as well as, a norm for accepting their illnesses like physical illnesses, led to contextual values that would have influenced the Dopamine Hypothesis of Schizophrenia's persistence. Because society held these new views about the mentally ill and their illnesses, psychiatrists may have been furthered interested in discovering the etiology of mental illnesses. Scientific discoveries receive more recognition when society is most interested in them. During a time period where mental illness was in the spotlight within society, making a landmark discovery, such as finding the cause of schizophrenia, psychiatry would have been given more recognition than if such a discovery was made at a time where psychiatry and mental illness was less acknowledged within society. Being that mental illness was a topic discussed more and more at this time, psychiatry was in a good position to make such an important discovery.

Society may have also greatly impacted the persistence of this theory in that this theory connected psychiatry to the popular sciences of this time. At the time of this theory's development, psychopharmacology and neurochemistry were very popular. The Dopamine Hypothesis of Schizophrenia linked psychiatry and mental illness to these sciences. This link would help to make the theory seem more credible, as it allowed it to fit in with mainstream science of the time.¹⁵ One development at this time was the discovery that Parkinson's disease could be linked to a single neurotransmitter deficiency. This link gave rise to the idea that one single medication that could address the symptoms of the disease and treat the disease, as well. This finding would allow for the Dopamine Hypothesis of Schizophrenia to be more accepted, as it also addresses the idea of an illness being solely a cause of a neurotransmitter deficiency. This finding also contributed to a pharmacological interest: if only one neurotransmitter was to blame, only one medication was needed, and this could bring in a lot of money for drug companies, thus drug companies would encourage the persistence of this theory.¹⁶

Helen Longino is well known for her work on values and objectivity in science. Longino believes that values—moral, contextual, and cognitive—guide scientific research. Longino focuses on cognitive values and contextual values in her work. She acknowledges the impact that values have on science, but she says that science may still be objective despite the impact of these values. Longino believes that science is a communal activity and it is this very characteristic of science that allows it to remain objective, even with the influence of values. Longino says that, because scientists may discuss and debate research, findings, and theories, science may be objective. When science is debated and discussed within a community, transformative criticism may occur. Transformative criticism changes contextual values if they are found to be ill. This means that, when scientists work together and engage in their research in a social way, values that compromise the objectivity of science may be changed, altered, or removed altogether.¹⁷

Longino's work on the objectivity of science could thus be beneficial for thinking about the persistence of the Dopamine Hypothesis of Schizophrenia, despite its dubitable scientific and philosophical status. Because this hypothesis's development and persistence has been so widely impacted by cognitive and contextual values, working on the theory in a communal way may reduce, or get rid of altogether, the subjective aspects of this theory. One of the major issues with this theory is that it is very general and different scientists in different places tested different variations of this theory. Some scientists believe that the dopamine excess is in the whole brain, while others believe that it is in a specific part of the brain. Some scientists believe that there is an excess release of dopamine in the brain, while others believe that the receptors for dopamine in the brain are oversensitive.¹⁸ The way in which a scientist applies this theory will affect the way they test it. Because this theory can be seen in so many different variations, it would be difficult to address this theory in a social, communal way and to engage in transformative criticism. Without transformative criticism, Longino says, science cannot be objective, as values would persist that would make science subjective.

Although Longino has never written specifically on the Dopamine Hypothesis of Schizophrenia, it can be concluded that she would believe that the best way to make this hypothesis objective and to further its development would be to critically engage with the hypothesis as a community, and reach a consensus on the theory. With the many variations of the Dopamine Hypothesis of Schizophrenia, approaching this theory in a communal way would be impossible, as there is not one way for all scientists to approach and engage in the theory. Scientists would need to find one specific definition of the Dopamine Hypothesis of Schizophrenia in order to be able to engage in this theory in a social context and for transformative criticism to occur. Longino may suggest breaking up the theory into a few separate theories. In doing this, each theory related to dopamine as a cause of schizophrenia could be researched and tested as its own and the information on each theory would be specific to that theory, rather than a variation of one single theory. This would allow each individual theory to be debated and discussed and for values to be removed from the theory through transformative criticism. Transformative criticism may even help to get rid of different theories altogether. Being able to remove certain theories about the relationship between dopamine and schizophrenia would allow scientists to come closer to finding the etiology of schizophrenia.

Helen Longino's idea of transformative criticism would help examine both cognitive and contextual values and bring the DHS closer to the objective truth about the etiology of schizophrenia. Contextual values are more difficult to be aware of as influencers of theories because it may be harder to see their impact on the theory. For a cognitive value such as truth, a scientist may more readily see how the desire for truth influences a theory by simply finding the faults and the areas of the theory that lack truth. A large scientific community with a variety of interests must be present to work on, debate, and discuss a theory. This is true because contextual values come mainly from societal views, interests, and norms of a time period. The larger the scientific community, the less consistent these values are. The less consistent these values are, the more likely it is that other scientists can pinpoint the influence of these values on the theory. For example, the contextual values that came about during the time of the development of the DHS were values in American culture. If European scientists were included in the conversations and debates on this theory, they would view the theory in a different light. Popular sciences at this time in Europe may have been different than in the US. Views of treatment of the mentally ill may also have been different in Europe and the US. These differences would influence the DHS differently and encourage debates between American and European scientists that would, with transformative criticism, reexamine the aspects of the theory that were subjectively influenced by contextual values.

Consider the ethical implications of the persistence of DHS. Understanding the etiology of an illness aids scientists in determining the proper way to treat a patient with that illness. Illnesses with an unknown etiology are more complex, however. In such cases, multiple treatments may be used to target possible causes, symptoms, and/or other factors predicted to impact the course of the illness. Because DHS is the only known hypothesis explaining the etiology of schizophrenia, pharmacological treatments used to treat schizophrenia are grounded on the DHS. Schizophrenia patients, then, are given medication used to aid in the decreasing of dopamine levels in the brain. This may be problematic because, like all medications, there are side effects of the prescribed medications. Side effects of any medication may be minor, such as a brief headache, or they can be severe, such as suicidal thoughts. Side effects present themselves differently in all individuals and may create a causal chain of new health problems for an individual. Provided that the DHS is an incorrect hypothesis for the etiology of schizophrenia, an individual may experience negative side effects that are not even worth the new problems that may arise, as they do not even need this medication. Decreasing the levels of dopamine in a person's brain is also problematic in that the human brain is very complex and there are an abundance of things about it that scientists still do not understand. Altering and disrupting the normal secretion, presence, and processes of a vital brain chemical, such as dopamine, may not only have immediate side effects and consequences, but also long-term, unknown consequences that could be detrimental and damaging to the normal functioning of the brain, as well.

Prescribing medicine to individuals that may cause them more harm and cannot be proven to have any beneficial effects is unethical. Medical professionals are expected to act in accordance with certain medical ethics principles, among them beneficence and non-maleficence. These two principles indicate that medical professionals should always strive to do good and, if they cannot do good, they mustn't do harm. Treating an individual's illness would be doing good, but when the proper treatment is unknown, it is not. It does not do good to give an individual a medication with unknown consequences and no true reason to believe it will solve their problem. In similar regards, treating a patient with such a medication fails to adhere to the principle of non-maleficence because the unknown side effects could be worse for the patient than leaving their illness untreated.

Autonomy is also an issue in situations involving treating patients with illnesses with unknown etiologies, like schizophrenia. Autonomy is defined as an individual's ability to make rational decisions for themselves. In the instance of mental illnesses, such as schizophrenia, autonomy may not be present in an individual. In such cases, an individual cannot readily evaluate the pros and cons of a medication that their psychiatrist may prescribe for them. A competent

individual may determine that taking a medication that may do more harm than good is not a risk that they are willing to take. A person with mental illness may not have the competence to rationally consider that same serious risk and blindly trust in their health care provider. This is unethical because it is taking advantage of an incompetent individual. Psychiatrists, like scientists, have contextual values, or background interests, as just discussed. Whatever these contextual values are, whether they be money, research, experimentation, or a genuine desire to do the best they can for their patient, they may influence whether these medications are prescribed to patients of schizophrenia or not. Different health care professionals believe differently about medicine: some believe strongly in the benefits of medicine regardless of side effects, while others are more hesitant in prescribing medications due to the potential negative consequences of medication. By prescribing medications that alter dopamine levels in the brain, psychiatrists, in a way, are taking advantage of the patient's inability to understand the risks associated with it. This is unethical because it gives autonomy to the health care professionals (paternalism). These health care professionals may have subjective biases, in the form of contextual values, that may lead to prescribing these medications regardless of the known and unknown short and long term negative consequences that could be worse for the patient than not being left untreated altogether.

Aside from the biological ethical implications of the persistence of the DHS, there are also implications for the patient's self-concepts and self-understanding. Diagnosing patients with mental illness gives them a label from their own perspective, as well as the perspective of others. This label can lead to a negative self-evaluation for people who have schizophrenia. This negative self-evaluation may be enhanced when diagnosing people with schizophrenia if they are told that their illness is a result of increased levels of dopamine. Naming this hypothesis the sole cause of the illness will lead patients to believe that the illness and their own treatment is beyond their control and that they will be bound to this label for their entire lives. This is problematic because psychological perceptions of an illness may heavily impact the ability to treat that illness. For example, patients that are enthusiastic about their treatment and are eager to develop a trusting relationship with their treatment provider are more likely to be successful in treatment. However, if patients think they are not able to contribute to their treatment or that they have no say in the progression of the illness, their treatment may be less effective.¹⁹

4. Conclusion

The Dopamine Hypothesis of Schizophrenia has been a dominant theory in explaining schizophrenia over the last 60 years. The Dopamine Hypothesis of Schizophrenia proposes that the cause of schizophrenia is due to increased levels of dopamine in the brain. Scientists disagree in what these increased levels may be attributed to: some believe that it is due to excess release of dopamine while others believe it is due to an increased sensitivity of dopamine receptors.²⁰ Although this theory has not had any direct supporting evidence, it has managed to persist in psychiatry due to the values, both contextual and cognitive, that encouraged the development of this theory. Helen Lognino, known for her work on the objectivity of science, would believe that the best way to look at the Dopamine Hypothesis of Schizophrenia from an objective viewpoint would be to divide this theory up, based on the many variations of it, and for scientists to engage in transformative criticism for each theory to allow the removal of values from the theories. Taking a more objective approach to the DHS would be beneficial for the patients of schizophrenia to help ensure that they get treatment that will better their overall health, rather than compromise it.

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