

How Identity is Impacted by Schizophrenia: A Metacognitive Lens

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Abstract

Schizophrenia affects approximately 1% of the world's population (Almulla et al., 2021).

Individuals with schizophrenia not only present with symptoms of hallucinations and emotional dysregulation but also demonstrate a loss of identity. This paper evaluates the literature surrounding schizophrenia through the lens of metacognition, highlighting elements of autobiographical and episodic memory. The paper also describes the etiology, epidemiology, symptoms, treatment options, and recovery progression that may be experienced by someone with schizophrenia. Accordingly, I evaluate the literature via the experience of someone with schizophrenia while also providing insight into the importance behind reviewing metacognitive research for an illness that disrupts an individual's identity.

Keywords: metacognition, schizophrenia, identity, memory

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Symptoms

Schizophrenia can be defined as the experience of delusions, hallucinations, and abnormalities in attention, emotional expression, and motivation (Andreasen et al., 1995). The presence of schizophrenia may be established by evaluating positive symptoms (e.g., delusions or hallucinations) and negative symptoms (e.g., avolition). Indeed, Andreasen et al. (1995) examined the appropriate uses of the Scale for the Assessment of Positive Symptoms, and the Scale for the Assessment of Negative Symptoms. They concluded that these scales provide a good measure for analyzing schizophrenia symptoms, but that there are three subcategories of symptoms instead of just the two. The three categories are positive symptoms, subdivided into psychosis (i.e., hallucinations), disorganized thoughts (i.e., inappropriate affect), and negative symptoms (i.e., emotional blunting).

Almulla et al. (2021) investigated the biomarkers associated with schizophrenia symptoms. They had participants complete the Hamilton Depression and Anxiety rating scales and assessed several interleukins, which handle immune responses, finding that negative symptoms were strongly associated with the scores produced on the scales. The overall severity of symptoms of schizophrenia was also strongly correlated with depression and anxiety, suggesting that increased depression and anxiety symptoms along with some physio-somatic symptoms are more prevalent in patients with treatment-resistant schizophrenia (i.e. a patient who did not respond to antipsychotics for more than two trials), than in patients who find some form of relief with antipsychotics. Further findings within this study include neurocognitive deficits such as those seen in episodic memory, and executive functioning being strongly

associated with depressive symptoms as low depression scores are related to low psychotic and negative symptom experiences.

Schizophrenia may also include delusions. A delusion is an irrational belief that is highly resistant to change or evidence and comes with a strong sense of conviction from the believer (Bruno et al., 2012). Bruno et al. noted that delusions come from a deficit in metacognitive processes. *Metacognition* is the ability for people to think about their own thinking (Bruno et al., 2012). However, when experiencing delusions, there is a deficit in *monitoring*, which is the ability to evaluate one's cognitive processes and *control*, the actions and behaviors driven by monitoring. Deficits in these processes can be detrimental because they have a large influence on a person's sense of identity.

Bruno et al. (2012) examined whether deficits in metacognitive processing can be attributed to schizophrenia symptomology or if deficits are more heavily rooted in delusional thinking. Their study assessed patients with schizophrenia for delusions using the Scale for the Assessment of Positive Symptoms and the Scale for the Assessment of Negative Symptoms (Andreasen et al., 1995). These scales allowed the researchers to separate patients based on whether they experienced delusions in addition to their baseline symptoms, leaving them with three groups: a control group, individuals with schizophrenia without delusions, and individuals with schizophrenia with delusions. Bruno et al. (2012) used a variation of the Wisconsin Card Sorting Task which has participants sort cards based on different rules, with the rule changing after 6 rounds. Participants rate their level of confidence after making their decision and also decide whether they want their decision to reflect in their overall score, prior to receiving feedback on their decision.

The results from this study supported previous research with scores of self-certainty (i.e., how much the participant believes they are definitely correct about their decision) being high while scores of self-reflectiveness (i.e., how much the participant believes they are wrong) improve due to the negative feedback they receive on their beliefs (Bruno et al., 2012). These findings can possibly be explained by recurrent systematic negative feedback from the task improving people's self-reflectiveness, while the current delusion the person is experiencing inflates their self-certainty. Although there were no statistically significant differences between people with and without delusions, self-reflectiveness was marginally higher in the delusional group and this group demonstrated higher levels of depression. The researchers were unable to conclude whether the deficits seen in the delusional group could be more heavily attributed to issues with metacognitive monitoring rather than control. As noted previously, monitoring and control have a large influence on an individual's sense of identity because they alter how someone thinks about their own thinking, suggesting the importance of understanding how the illness progresses which will be discussed in the next section.

Epidemiology

Orrico-Sánchez et al. (2020) described the prevalence, use of healthcare, and use of antipsychotics among the documented schizophrenic population in Valencia, Spain. They found that schizophrenia prevalence was higher among men than women, but that the discrepancy decreased with age. This difference may be accounted for by differences in age of onset between men and women, whereby men typically have an earlier age of onset than women. For example, Hafner et al. (1993) used a retrospective assessment to analyze whether the difference in age at first hospital admission between sexes can be attributed to age of onset of schizophrenia and whether symptoms and course of illness differ by sex. They followed up with hospitalized

participants after their episode had remitted to discuss life events, coping skills, and their social support systems. The results showed that the sex difference in first admission rates were related to age of onset of the illness with women developing schizophrenia, on average, three to four years after their male counterparts. However, neither sex nor age seemed to predict the progression of schizophrenia, or the symptoms experienced by the individual. Finally, the accumulation of anxiety and depressive symptoms in these patients was no more prevalent than the occurrence of anxiety and depression in the general population.

The difference in age of onset may be attributed to the protective effects of estrogen (Hafner, 2003) which may account for why there seems to be less severe symptoms for women earlier on in their diagnosis. However, once menopause starts and the effects of estrogen decline, there are more severe symptoms seen in women, similar to those that present in men. Although the disease progression is fairly stable between men and women, Hafner notes that social factors may be more favorable for women than men because they have a longer period of time to solidify their support systems before the onset of the more severe symptoms typical of someone experiencing schizophrenia.

Treatment

Toto et al. (2019) examined prescription data from the International Drug Safety Program in Psychiatry, evaluating prescription patterns for individuals being treated for schizophrenia using different classes of medications (e.g., antipsychotics vs antidepressants). They found an increase in prescription of second-generation antipsychotics and a decrease in prescription of first-generation antipsychotics. Clozapine was administered primarily for individuals with treatment-resistant schizophrenia in combination with antidepressants, anticonvulsants, or tranquilizers. It was common for individuals being treated with antipsychotics to also be in

therapy. However, when this does not work, sometimes antipsychotics will be combined to increase treatment effectiveness, though how effective this approach is needs further study.

Other unconventional approaches have proven to have clinical potential. Maurus et al. (2023) completed a clinical trial investigating the effects of aerobic exercise on individuals with schizophrenia compared to weight training. Participants exercised up to 3 times per week for 6 months. Their results did not suggest any advantages of aerobic exercise over weight-training but indicated that the participants in both groups who remained with the study through completion had improved societal functioning, cognitive flexibility, and short-term memory within the study but also in the 6-month follow-up period. This trial is important because it suggests options such as exercise that can possibly help provide some relief from their symptoms for individuals with treatment resistant schizophrenia.

Etiology

Schizophrenia is a difficult diagnosis to live with and support someone with, which is why it is important to understand why it occurs before considering how it affects those living with it. Tarakita et al. (2018) investigated the different reasons that people believe their loved one has schizophrenia. Researchers gave a 30-item list of possible causes of schizophrenia to patients, family, and medical staff in a hospital setting. Whereas medical professionals held more beliefs about the cause of schizophrenia being rooted in biology, for families and patients the causes were rooted in psychosocial factors, such as issues in relationships and stress in jobs or school. Thus, perceptions of schizophrenia prevalence may differ based on knowledge of the field, but all these perspectives encompass different possible contributors that must be understood.

Following the lens of biological factors, Kumar et al. (2019) examined brain regions, namely the hippocampus, prefrontal cortex, and striatum, in a genome-wide study and found neuronal genes that were impacted by the presence of schizophrenia in all of the examined regions. These genes are implicated in housekeeping abilities such as catalysis and enzymatic regulation which can lead to problems with processing external stimuli in the brain. It has also been noted that there are issues with ubiquitination, known as the process of regulating cellular functions. Impairments in this mechanism may hinder cellular energy production further causing cognitive deficits for patients with schizophrenia. Knowing about the causes of schizophrenia can aid in developing treatment plans. But while it is important to understand the different causes of schizophrenia, it is also important to understand how schizophrenia impacts an individual's sense of identity.

Metacognition

As previously noted, metacognition is the ability to think about one's own thinking (Vohs et al., 2016). Austin et al. (2015) examined the association between metacognitive beliefs, which are the thoughts you have in regard to yourself about a specific behavior, and the course of psychotic symptoms using the Metacognition Questionnaire 30 to establish metacognitive abilities and the Life Chart Schedule semi-structured interview to determine the course of a patient's psychotic symptoms. They concluded that the higher people's metacognitive beliefs were, such as believing that rumination will help you cope, the more severe their psychotic symptoms were, although there was no pattern of which metacognitive beliefs were elevated across participants. These results are important because people experiencing psychotic symptoms may have lower confidence in their cognitive abilities which can lead to rumination and higher levels of distress, further inhibiting their quality of life.

Metacognition also includes *metamemory awareness*, which is how an individual controls and monitors the processing of relevant information in accordance with the requirements of the given memory task. Bacon and Izaute (2009) investigated metamemory judgments by eliciting *feelings of knowing* (FOK), which is how capable the person feels they are at retrieving missing information. The participants learned a nonsensical string of letters followed by a distractor task, then had to provide a FOK estimate on how likely they would be able to choose the correct string of letters out of 8 options. The researchers hypothesized that FOKs would parallel retrieval abilities. Their results supported this hypothesis with lower recall being accompanied by lower FOK evaluations, meaning the less confident someone felt about their ability to choose the right string of letters, the worse their recall ability was for that string of letters.

Other aspects of metacognition include *self-reflectivity*, or the ability to think about your own mental capacity, *decentration*, the ability to comprehend the world from multiple perspectives, and *mastery*, the ability to use metacognition to solve psychological problems and understand how others perceive the world (Vohs et al., 2016). Vohs et al. examined EEG activity in relation to metacognitive abilities in people with schizophrenia. Their results showed that people with higher gamma band activity at the frontal and central electrode areas had a decreased ability to see the world from multiple perspectives, (i.e., decreased decentration). They compared this finding with other frequencies but found no significant relationship with metacognition. However, at rest, participants had high-frequency gamma band activity, which was associated with hyperexcitability, signifying excess cortical inefficiencies. These excess cortical inefficiencies are not only seen in metacognition, but also within memory itself (Mediavilla et al., 2021).

Autobiographical Memory

Deficits found in *autobiographical memory*, (i.e. memories you have in relation to yourself and your experiences) are found primarily in problems retrieving specific past events, level of detail, and conscious recollection of the memory which may cause problems for people with schizophrenia who are trying to establish their identities (Mediavilla et al., 2021). Mediavilla et al. reported that people with schizophrenia who have psychotic symptoms remembered more general, abstract details of an event than the personal details of that event. They also noted that such deficits in their autobiographical memories may be attributed to issues with their metacognitive abilities.

Zhang et al. (2019) systematically reviewed the literature on the presentation of autobiographical memory in individuals with schizophrenia. Similar to Mediavilla et al. (2021), they reported that people with schizophrenia produce less detailed autobiographical memories compared to a control group. The review also examined the effects of positive and negative psychotic symptoms on the memory capacity of someone with schizophrenia. Zhang et al. (2019) found that positive psychotic symptoms were inconclusive in their relationship with memory capacity; however, negative psychotic symptoms were related to things such as an individual's autobiographical memory specificity meaning that deficits in autobiographical memory may be a predictor of negative symptoms.

Herold et al. (2023) explored the importance of identity through autobiographical memory in individuals with schizophrenia, examining autobiographical memory over 7 years. Participants completed an autobiographical memory interview that asked about the various periods of a person's life. Their results showed that although semantic memory decreased with time, the specificity of autobiographical memories was stable. Older adults showed less detailed

autobiographical memories, but in healthy controls this did not impact their semantic memory capabilities as it did in individuals with schizophrenia.

Memory deficits were further seen in Bennouna-Green et al. (2012) who had participants write down 20 “I am” statements by using the Twenty Statements Task in order to recall six autobiographical memories cued by these “I am” statements. Participants then evaluated their own statements and autobiographical memories. Bennouna-Green et al. found that people with schizophrenia used traits and positive statements similar to controls, but that their statements were much more vague than those written by controls. Also, memories retrieved based on these statements were much less detailed and informative than those made by controls. Finally, elements of the memories themselves were structured differently. For example, the thematic organization, (e.g., themes of the memory itself, such as being on vacation and what you were doing) between the autobiographical memories and their respective statements were altered, meaning that the themes within the original memory and the provided statement did not match. When the statements and their respective autobiographical memories were evaluated by the participants, they seemed unaware of their diminished self-coherence. Individuals with schizophrenia may be less aware of their condition and the possible effects it exerts on their societal functionality and relationships. Similar deficits are also seen within episodic memory which will be discussed next.

Episodic Memory

Riutort et al. (2003) had participants complete an autobiographical fluency task where they were asked to provide a unique memory to 4 given time periods, and as many names of friends as possible within the same periods to evaluate personal episodic and semantic memory. They also completed an autobiographical memory inquiry that was divided into various time

periods and participants were asked questions probing for a memory of a personal event. These tasks were used on the premise that people with schizophrenia may have ineffective encoding and retrieval processes that contribute to autobiographical memory issues. Their results showed that participants with schizophrenia had impaired episodic and semantic memory, along with less specific autobiographical memories compared to a control group. They also noted that episodic and semantic memory deficits were apparent mostly after the onset of schizophrenia.

Owens et al. (2011) studying twins, investigated whether such episodic memory deficits have any genetic correlation with a schizophrenia diagnosis or IQ. The study used measures from the Wechsler Memory Scale – Revised to evaluate episodic memory. Owens et al. observed that the more genes that were shared between the twins (increasing the risk of schizophrenia for the non-affected twin) the worse memory performance was. The form of episodic memory with the greatest risk of heritability was verbal memory. Although their findings did not support a correlation between memory and general intelligence levels, Owens et al. found that verbal memory, visual learning, and visual memory were all heritable capabilities with a large genetic correlation with schizophrenia.

Wang et al. (2010) had participants complete a context memory task before undergoing fMRI. During fMRI participants were asked to recall the context where they encountered a previously studied word. The findings showed that differences in brain structure in individuals with schizophrenia compared to controls did not significantly change the functionality of the brain. Instead there were differences in functional connectivity or how the brain communicated as a whole, when looking at the local and global connections, or how efficiently information is exchanged within a given network.

Looking further into the deficits seen in episodic memory are Lee et al. (2018) who examined recollection, which refers to memory for the details of an encoded event bound to a context. They also investigated familiarity, which is the feeling that the stimulus was previously encountered without conscious recollection of the specific event, including its context. This particular study looked at social interactions in people with schizophrenia and whether their memories of these events are impaired in different phases of the illness. They used three groups of participants at different phases of the illness and the Social Remember-Know paradigm. The Social Remember-Know paradigm is where participants experience non-social and social stimuli (e.g. short videos showing a person alone and then the same person interacting with another person) and later attempt to remember elements of that interaction. During the first part of retrieval, participants looked at faces and decided if they were old (i.e., studied) or new (i.e., not studied). If they were deemed old, the participant then had to decide whether the face was familiar (they know it), or if they remembered it (they have a specific memory of it). People with schizophrenia showed impaired episodic memory for social interactions, specifically within recollection, rather than in familiarity. Thus, people with schizophrenia may experience a different form of social processing. Since memories of social interactions may be impaired, it follows that people with schizophrenia have deficits in effort on given tasks as well.

Effort and Motivation

Effort and motivation have been extensively studied in people with schizophrenia. For example, Saleh et al. (2023) had participants complete an effort based decision-making task offering monetary rewards if they used physical effort. Their results showed that people with schizophrenia were less motivated to do the task than controls. Similarly, a meta-analysis by Blouzard et al. (2023) examined the trade-offs between cognitive and physical effort and rewards

in people with schizophrenia. They found that there was reduced effort given for the reward for individuals with schizophrenia. In addition, larger rewards did not influence the amount of effort given for any specific task.

However, Motivational Intensity Theory has helped researchers predict contradictory results. The theory states that people avoid wasting energy and use only the required amount of energy needed to reach the desired goal based on given information, such as the difficulty of the task (Décome et al., 2021). Décome et al. had participants decide about whether they wanted to complete a physical task and how much effort they were going to apply. Their results showed that people with schizophrenia made similar decisions, compared to a control group, about how much effort to exert. They also found that people with schizophrenia were just as likely to exert effort on difficult tasks, similar to the controls, contrary to previous research. This research supports the idea that effort and motivation levels may vary depending on the type of person who has schizophrenia. These are all important findings because effort and motivation play a large role in a person's identity as it takes both effort and motivation to maintain or alter pieces of your identity. However, while effort and motivation deficits are an issue in people with schizophrenia, anosognosia is an even larger problem.

Anosognosia

According to Gerresten et al. (2014), almost 60% of people with schizophrenia have an impairment in their knowledge of their diagnosis. This impairment leads to problems with continuing medication and negative treatment outcomes and may be due to two factors: denial and lack of awareness. Gerresten et al. (2014) had participants complete an illness denial task while doing an fMRI, answering yes or no to statements referring to their illness. The results showed that people with impaired illness awareness under-recruited the left frontoparietal areas

while being self-reflective. However, they also overrecruited this same area when thinking about their illness related beliefs. A secondary data analysis done by Pyne et al. (2001) examined demographic variables in relation to illness awareness in people with schizophrenia. Their results showed a modest association between younger age and illness nonbelief, suggesting that younger people are more susceptible to problems with illness awareness. Their results also showed that the more hospitalizations someone had experienced, the more likely they were to struggle with illness awareness.

Lysaker et al. (2008) did an exploratory study investigating metacognitive abilities and executive functioning capabilities (inhibition switching and mental flexibility) in relation to illness awareness using data from two different studies. Their results showed that people with higher scores for awareness did better on mental flexibility tasks. However, the inability to see the world from other's perspectives was correlated with a lower response on the task asking participants to inhibit a response and then choose a new course of action. These correlations may reflect a lack of mental flexibility. Less mental flexibility would suggest that participants would have more difficulty understanding the nuances behind their emotional and mental states. These are all important findings because anosognosia plays a large role in the development of identity post-diagnosis and the level at which an individual will recover from an episode.

Recovery

The general course of schizophrenia is not well understood as it changes between individuals. Torgalsboen et al.'s (2023) 10-year longitudinal study tracked the course of schizophrenia in first episode patients. They found that cognitive performance improved at about the same rate as healthy controls until the 6th year when both groups stabilized. However, they also found that cognitive functioning was significantly lower in the patient group compared to

the control group. Their results showed that over half of the participants had fully recovered from their episode after 10 years. Other work suggests that resilience and social support both play a large role in people's abilities to recover from an episode (Li et al., 2023). These results are important because they promote the idea of recovery rather than just preventing a relapse of the episode, giving people with schizophrenia more hope and opportunity to thrive beyond their diagnosis.

Importance

Schizophrenia is a very difficult diagnosis. There are many caveats and variations from person to person making it difficult for anyone within the support system of a given individual to know how to best support them. Examining deficits within metacognition and how those deficits affect an individual's identity through their memory, motivation, treatment, and recovery are vital to better understanding the progression of schizophrenia. Moving forward it is important that this research continues to expand and to look into new possibilities of how and why schizophrenia progresses in the way it does because metacognition is fundamental to our understanding of ourselves and our identities.

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