Review Article

Schizophrenia, recovery and the self: An introduction to the special issue on metacognition

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ABSTRACT

In this special issue, work is presented linking metacognition among persons with schizophrenia with a range of psychosocial outcomes including vocational functioning, empathy, motivation, self-evaluation, and other cognitive functions. This overview will highlight how these works allow for the quantitative study of processes which underpin alterations in self-experience in schizophrenia, which in turn allows self-experience to be studied as part of a larger set of brain-based and social phenomena whose interaction influences the trajectory of one's life and illness. We explore the hypothesis that metacognitive capacity, as a node in a larger biopsychosocial network, may be accessible by psychosocial treatment and, if successfully targeted, may disrupt the processes which perpetuate disability. Limitations and directions for future research are also discussed.

1. Why metacognition matters as an emerging concept in schizophrenia research

Work in the allied fields of mental health and rehabilitation has increasingly recognized that recovery from most complex mental health challenges requires activities which are metacognitive in nature (Lysaker et al., 2018a). For example, the metacognitive processes that enable persons to form integrated ideas about themselves and others within the flow of their lives (Moritz and Lysaker, 2018) seem essential when any individual has to decide how to make sense of the challenges posed by the alterations in thought, emotion, personality, or social opportunity, which may come with mental health challenges. Similarly, the metacognitive capacity which underlies the ability to notice and reflect upon experience would similarly seem necessary for a person to collaborate with others and find a way to sustain meaningful connection within one's community.

Metacognitive processes have been consequently suggested to be essential for recovery, regardless of the ultimate causes of the mental health challenges (Lysaker and Klion, 2017). Whether compromises in mental health are primarily the result of environmental and social factors (e.g. stigma, poverty, trauma, or social alienation), biological factors (e.g. disruptions in basic brain function), or a complex interaction between these factors, recovery may require that the person form an idea of those challenges and how they should be dealt with or

managed (Leonhardt et al., 2017). Self-management and sustained wellness thus require not just knowledge about psychiatric and social challenges, but also awareness of the experience and thoughts of others, one's strengths, personal history, and values. Recovery thus requires the integration of that information into a meaningful sense of what is happening in one's life, which can be the basis for reflection and action. Specifically, persons must make sense of what has been uniquely interrupted within their own life, how it was interrupted, and what that experience means to them. What has the person uniquely lost, and for what should the person hope? In light of this, how should a person continue to pursue a meaningful life?

2. Metacognition, function, and recovery in schizophrenia

The papers in this special issue explore metacognition in schizophrenia, as decreased metacognitive capacity may be a core feature of this illness and a significant barrier to recovery. The works in this issue therefore offer opportunities for scientific advances including the identification of phenomena, perhaps previously invisible or at least neglected, which, when disrupted, may lie at the root of continuous suffering and dysfunction. In a review of cross-cultural work on metacognition by Lysaker et al. (2019c), detailed evidence is laid out that metacognitive deficits can be broadly detected in psychosis and act as a proximal moderator of the effects of other social and biological

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functions on function. These findings are suggested to be consistent with Bleuler's (1950) original model of schizophrenia and have inspired efforts to develop metacognitively oriented integrative psychotherapies, such as Metacognitive Reflection and Insight Therapy (MERIT; Lysaker and Klion, 2017). Wright et al. (2019) offer a richer sense of how metacognition is related to highly specific aspects of vocational function in first-episode psychosis, while Bonfils et al. (2019) examine how metacognition is related to empathy in a novel experimental task. Luther et al. (2019) explore the relationship of intrinsic motivation with metacognitive function, while Jones et al. (2019) focus on the real-life consequences of congruence of self-appraisal and the appraisal of others. Finally, in one of the first longitudinal studies of its kind, Kukla and Lysaker (2019) document how changes in metacognitive function over time are linked with changes in other phenomena, including neurocognition and social cognition.

These works taken together point to an even broader set of scientific as well as humanistic issues. First, this body of work provides methodologies for the quantitative exploration of how alterations in self-experience are a key aspect of complex mental health conditions, without reducing self-experience to either the status of an epiphenomenon or casting the self as something which in dualistic terms is distinct and unrelated to the body. Practically, this allows for a way to see persons diagnosed with schizophrenia and other major mental health conditions as whole persons who actively experience and confront, rather than passively endure, some of the most perplexing forms of psychological and emotional suffering. Second, from a more research-oriented view, this body of work allows us to potentially situate metacognition as a node in the complex social and biological network, whose parts interact to generate a range of possible outcomes. This network perspective may provide a glimpse of how metacognition, biological, social, and phenomenological variables influence one another within the course of a unique life trajectory. As a whole, these papers offer a more nuanced view of the concept of disability and the tasks facing recovery-oriented treatment. We will now discuss each of these issues in a broader sense and then turn to directions for future research.

3. A path to the quantitative study of alterations in self-experience in psychopathology

The papers presented in this issue broadly offer quantitative approaches that may surmount previous barriers to the scientific examination of the vicissitudes in self-experience in complex mental health conditions. Qualitative, quantitative, and clinical research, as well as first-person reports, have indicated that many individuals diagnosed with schizophrenia have significant changes in self-experience (Lysaker and Lysaker, 2010). These alterations include loss of agency and loss of the cohesiveness of one's personal identity (McCarthy-Jones et al., 2013). They cannot be reduced to the side effects of symptoms, and they are for many a key aspect of the experience of schizophrenia (Hamm et al., 2018; Leonhardt et al., 2017). Despite calls for over two decades to consider these alterations in self-experience as core aspects of in schizophrenia (Esteroff, 1989; Roe, 2001), there have been many challenges to understanding them as they occur in the midst of other aspects of the disorder.

One of the barriers to understanding how alterations in self-experience fits into a larger picture concerns the nature of self-experience itself. Self-experience is immediate, intimate, continuous, and yet elusive. We do not experience the self in ways that are similar to how we experience things in the world. For example, the self is not something we can observe by virtue of its location in space or the qualities it shares with objects. William James, among the first psychologists to think systematically about this concept, proposed that self-experience is our experience of ourselves as we encounter the world. We do not just experience the world. We experience ourselves experiencing the world. We interpret and respond to the world and can experience ourselves

making those interpretations and responses.

It is thus naturally difficult to characterize what underlies alterations in this process. Self-experience is so instantaneous that we often do not notice it in the midst of our encounters with things, people, and situations in the world. So what does it mean when we notice that something about our self or our self-experience has changed? What does it mean when persons with schizophrenia can no longer, in essence, find themselves as they experience the world? What happens when someone perceives that their self-experience has changed or been diminished? Certainly, the identity of one person can never be the same as another; thus, how could there be common changes in self-experience?

Mirroring dualistic theories of the mind, which divide the mind from body, it has been tempting for many to think that the self is something distinct from other neurobiological processes or that alterations in self-experience reflect the self as having become detached from the person whose identity it define. But if this approach is taken, there is nothing measurable to underpin changes in self-experience. Changes in self-experience stand on their own. They are axiomatically unrelated to other phenomenon. Aspects of this approach seem to have persisted in part and have been suggested (Lysaker et al., 2012) to underlie various theories, ranging from Kraepelin's original idea of the mind in schizophrenia as an orchestra missing a conductor to phenomenological models of schizophrenia, which suggest that it involves a disturbance of basic or minimal self (ipseity) (e.g. Nelson et al., 2014). These potentially dualistically-rooted approaches often involve assessments of the strangeness of self-experience (Sass et al., 2018) and the lack or oddness of experience is merely what it is and nothing more can be said about it. These views have consequently been suggested to fail to offer an understanding of how these experiences can be altered at a particular point and then later recovered as well as how intimately they are linked to emotional pain (Hamm et al., 2015; Lysaker et al., 2018b). These approaches have also been criticized for not lending themselves to testing whether altered self-experience fits into a complex network of interacting discernable psychological, social and biological features (Hamm et al., 2018).

We suggest that research on metacognition presented in the special issue may help the field go beyond dualistic approaches to understanding alterations in self-experience. Specifically, the methodologies which underlie and inform what is referred to as the integrated model of metacognition (Lysaker et al., 2019d) allow that alterations in self-experience are not a matter of the loss of something internal. In the integrative model of metacognition, metacognition refers to the automatic and effortful process which allow embodied, cognitive, and emotional experiences within the flow of life to be pieced together into a broader and holistic sense of oneself and others. Thus, metacognitive deficits only allow for only a fragmented sense of self to be available in the moment. Measurable deficits in metacognitive capacity leave persons, in particularly contextualized moments, without the ability to produce complex, evolving, and integrated senses of themselves and possibilities for future action. It is not merely strange or disembodied experience separate from the rest of the person that is at issue but the collapse of a measurable capacity. This capacity can be empirically studied and also represents something which when recovered, can reverse alterations in self-experience.

4. Metacognition as a central node in larger social and psychological networks of schizophrenia

One of the first major implications of this work is that we now have processes intimately connected to self-experience whose relationship to other social and biological processes can be measured. This could permit greater understanding of findings that schizophrenia reflects a range of different causal factors, clinical presentations, and outcomes (e.g. Radua et al., 2018). Consistent with Bleuler's (1950) suggestion that the fragmentation of experience of thoughts, emotions, and desires explained clinical heterogeneity, the integrated model of metacognition

allows us to explore how metacognitive deficits interact with neuro-biological, clinical, and social phenomena.

One way to study these complex relationships is with network analysis. In this emerging field, a network is defined by a series of discrete elements, which have varying patterns of connections with one another. In network analysis, elements are conceptualized as nodes and connections as the edges of the network (Costantini et al., 2015; Epskamp et al., 2018). Rather than a simple causal model in which one event affects another, network analysis enables a visualization of how different factors continuously affect one another in a manner roughly analogous to an electronic circuit. Applied to mental health conditions, networks have been used to examine the mutual effects of different problems or challenges (Fried et al., 2017). In a network, a node is important not necessarily because of its influence on another specific node, but because it connects more nodes with one other.

Following the integrated model of metacognition, different causal factors, clinical presentations, and outcomes might be seen as part of a network connected through disturbance in metacognition. With a backdrop of previous work linking metacognition with clinical phenomena, including negative symptoms and alterations in basic brain function (Lysaker et al., 2019c), the papers in this special issue suggest that metacognition is a node related to complex outcomes including work function (Wright et al., 2019), psychosocial adaptation (Jones et al., 2019), empathy (Bonfils et al., 2019), and motivation (Luther et al., 2019). The potential of metacognition as a central node is also supported by links between metacognition and cognitive phenomena thought to be related to both outcome and biological functions at multiple levels – of the cell, neurotransmitters and the ongoing interaction of brain regions (Kahn et al., 2015).

The possibility then arises from this view that compromises in metacognition, while perhaps neither a key cause of the condition nor a key psychosocial outcome, may be a key piece of the puzzle in understanding schizophrenia because they are a central node in the network; they connect biological activity with consciousness, meaningful connection, and participation in the community. Indeed, in light of initial analyses which have shown a complex network including symptom and function outcomes (e.g. Galderisi et al., 2018), the studies within this special issue offer metacognition as a key node or even a substrate, which connects and allows for the continuous interaction among these phenomena. Thus, differing levels of metacognition may in part explain why distal connections between biological, social, and phenomen-ological outcomes are not so robust. Following similar work on resilience (Galderisi et al., 2018), studying metacognition as a node in an interconnected network may help us understand how people diagnosed with schizophrenia meet challenges in such diverse ways.

As a simple example, in the path from symptoms to motivation to job tenure, the relationship of symptoms and motivation may likely be affected by the kind of sense people make of symptoms and their decisions about how to respond to them. This pathway may also affect job tenure; reciprocally, job tenure can then affect symptoms, all the while the person's understanding and response to challenges also affects their motivation.

Illustrating the potential of the network approach for understanding the role of metacognition, Cella et al. (2015) have argued that previous models suggesting links between neurocognitive abilities - including flexibility, planning, and memory - and work function may be enhanced by adding metacognition as a variable not only affected by cognitive phenomena but which also directly affects work function, creating a feedback loop. As another illustration of this possibility, Hasson-Ohayon et al. (2018) recently conducted a network analysis that included five domains of symptoms, six domains of neurocognition, and multiple aspects of both social cognition and metacognition. Findings indicated that metacognitive self-reflection, along with cognitive dis-organization, were the variables that most often connected other variables to one another, suggesting both were the central hubs of the network.

5. Clinical implications

The view of metacognition in schizophrenia as a measurable way to study alterations in self-experience and as a central node in a network of behaviors, emotion, and cognition has several immediate and prac-tical implications. Foremost, if metacognition represents a proximal cause of disability, it may offer a relatively accessible treatment target. Regardless of whether they are an initial cause of dysfunction, the amelioration of metacognitive deficits may interrupt or alter the re-lationship that exists within the larger network of social and biological variables. The treatment of metacognitive deficits may alter the systems which sustain disability, resulting in improvements in causal factors, without addressing those causes directly. For example, it is conceivable that, with greater capacity to form and evolve an integrated sense of self and others, persons might be able to make sense of the trauma that precipitated psychosis - or the trauma of psychosis itself. With greater capacity to form and evolve an integrated sense of self and others, persons might similarly be able to make sense of anomalous experiences characteristic of Schneiderian first rank symptoms. With enhanced metacognitive capacity, they might become better able to manage dif-ficulties they experience when trying to respond to complex social si-tuations. If making sense of experience is a key aspect of membership in the human community, even persons with severe disturbances in thoughts, emotions and behavior who develop their metacognitive ca-pacities may become better able to see themselves as part of larger social structures, as well as combat stigma which restricts community membership (Lysaker et al., 2019b).

Importantly, positioning metacognition as a treatment target does not necessitate the creation of a new set of interventions. In addition to new treatments being developed that specifically target metacognition, including MERIT (Lysaker and Klion, 2017), a range of empirically validated interventions exist that lead to desirable outcomes, such as enhanced work function, social support, self-compassion, and reduc-tions in symptoms, stigma or distress (Ascone et al., 2017; Bredemeier et al., 2018; Yanos et al., in press). The view of metacognition as a central node in a network of psychosocial phenomena suggests that some existing treatments may exert their effect via their impact on metacognitive capacity. For example, Cella et al. (2015) suggested that cognitive remediation may affect work function through its effects on metacognition, which opens up sustainable feedback between work, flexibility, planning and memory. Bredemeier et al. (2018) have also recently pointed to a bi-directional feedback relationship between self-reflection (an element of metacognition) and neurocognition in a nat-uralistic and recovery-oriented treatment trial. Moritz et al. (2018) make a similar point that exercises designed to combat reasoning bias may also impact health when they enhance the capacity for self-re-flection in the world. Others have suggested that diverse approaches, including psychodynamic and humanistic psychotherapy, might also promote health via their effects on metacognition (Knauss et al., 2018; Lysaker et al., 2019a).

Concretely, what is suggested here is that a range of interventions affect outcome when they also affect how readily persons form complex and integrated ideas of themselves within the flow of life. Interventions which target beliefs, symptoms, or skills seem to "work," yet it may be that they work when they help persons diagnosed with schizophrenia to piece together immediate and past experience as a whole person, decide what they think has gone well, and what has gone poorly, and then decide how to manage this. They might also "not work" when they inadvertently think *for* people or coach them to accept others' pre-formed ideas. Cognitive remediation and cognitive therapy, as well as the older psychotherapeutic approaches suggested above, may not only affect isolated skills but help persons think more flexibly and positively, and form a richer and less fragmented sense of self. Perhaps with en-hanced cognitive abilities and a solid therapeutic alliance, persons may become better able to recognize and pursue what they want from themselves, others and life in general (Hamm and Lysaker, 2018).

6. Conclusions and future directions

In summary, this special issue presents a range of papers that speak to the potential to measure core processes which underlie the continuity and coherence of self-experience in schizophrenia. Results support the hypothesis that metacognition may play a relatively central role in the interacting network of biological, social and psychological phenomena. This work provides another piece of evidence that interventions which enhance metacognitive capacity may enable persons with schizophrenia to move towards recovery by assisting them to make personally meaningful sense of their psychosocial challenges, to recognize their strengths and abilities, and use that knowledge to effectively manage their lives.

There are limitations to note. Most studies were cross-sectional and relatively modest in size. Studies also used single assessments of key constructs. The work thus is clearly in its early stages, and future research is needed. Work is required with more diverse samples including persons who refuse treatment and persons in developing countries in Asia, Africa, and Latin America. Longitudinal studies are required which measure multiple outcomes over longer periods of time. The exact relationship of broader assessments of metacognition with more focused assessments of cognitive judgments (Gould et al., 2015) is poorly understood, and research and theoretical work is needed to understand how these methods overlap and diverge. As noted by Lysaker et al. (2018b), considerable work is needed to understand how effortful and automatic processes, as well as cognitive and embodied experiences, complement one another in consciousness and come together to allow a sense of self and others to be available in the flow of life. Work also is lacking exploring the linkage of metacognitive functions with the basic brain activities which support key aspects of introspection (Pinkham et al., 2018). Deficits in metacognition are also considered regardless of their causality; work is needed to determine whether metacognitive deficits, for example those primarily linked to trauma versus those linked to neurocognitive compromise, are indeed equivalent. Extensive testing of the potential metacognitive mechanisms of various treatments, including those designed to target metacognition (e.g. Lysaker and Klion, 2017) are needed to confirm these hypotheses.

Declaration of competing interest

There are no conflicts of interest or disclosures.

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