



Metacognition and schizophrenia: The capacity for self-reflectivity as a predictor for prospective assessments of work performance over six months

Paul H. Lysaker^{a,*}, Giancarlo Dimaggio^b, Antonino Carcione^b, Michele Procacci^b, Kelly D. Buck^c, Louanne W. Davis^a, Giuseppe Nicolò^b

^a Roudebush VA Medical Center and the Indiana University School of Medicine, United States

^b Terzo Centro di Psicoterapia Cognitiva, Associazione di Psicologia Cognitiva, Rome Italy

^c Roudebush VA Medical Center and the Purdue University School of Nursing, United States

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ABSTRACT

Research has indicated that many with schizophrenia experience deficits in metacognitive capacity, defined as impairments in the ability to think about thinking. These difficulties are related to, but not reducible to symptoms and have been hypothesized to function as an independent impediment to psychosocial function. To explore the possibility that deficits in one domain of metacognition, self-reflectivity, are a barrier to effective work function, 56 participants with schizophrenia were categorized into three groups according to their capacity for self reflection based on an interview conducted prior to accepting a job placement. Blind ratings of work performance of these three groups over the next six months were then compared. Results of repeated measures ANOVA revealed that the group rated as having the highest level of metacognition, that is, able to see that their conclusions are subjective and fallible, had higher ratings of work performance over time than groups with medium and low levels of self reflectivity. These findings were found to persist even when impairment on a test of executive function was controlled for statistically. Results are interpreted as consistent with emerging models that deficits in metacognition may be key features of severe mental illness which affect function. Clinical and theoretic implications are discussed.

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1. Introduction

Metacognition refers to the general capacity to think about thinking (Semerari et al., 2003). This capacity is thought to reflect a general aptitude that involves a wide range of semi-independent faculties which allow individuals to perform discrete tasks such as forming representations of their own mental states and the mental states of others, and to form, question and revise ideas of what is believed, felt, dreamt of, feared, feigned or pretended in any of a number of rapidly evolving contexts. While metacognition may be associated with neurocognition, it differs from that construct in that

it refers both to implicit and explicit understanding of, or recognition of, knowledge about one's own thought processes and internal states. It also allows for the formation, and then either acceptance or rejection, of ideas about oneself in the moment and about one's identity and personal characteristics across time.

Over the last 15 years, research has suggested that impairments in the abilities to think about thinking, referred to here as metacognitive capacity, are a unique feature of schizophrenia (Frith, 1992; Brüne, 2005; Stanghellini, 2004). Persons with schizophrenia, for instance, have been found to have difficulties forming ideas about the things other people are thinking, decoding irony in speech, grasping the meaning of sentences from vague hints, evolving coherent account of their personal narrative as well as recognizing themselves as the source of one's own thoughts and actions (Brüne, 2005; Blakemore et al., 2000; Franck et al., 2001; Langdon et al.,

* Corresponding author. Roudebush VA Med Center (116H), 1481 West 10th St, Roudebush VA Medical Center, Indianapolis Indiana 46202, United States. Tel.: +1 317 988 2546.

E-mail address: plysaker@iupui.edu (P.H. Lysaker).

2002; Lysaker et al., 2005a; Lysaker and Lysaker, 2008; Stratta et al., 2007). Importantly, deficits in metacognition in schizophrenia are enduring and cannot be explained as simply a reflection of symptoms or other deficits (Abdel-Hamid et al., 2009; Buck and Lysaker, 2009; Langdon et al., 2001; Roncone et al., 2002).

Of note, we have selected the term “metacognition” because of its potential to describe a wide range of internal and socially-driven cognitive acts which contain primarily reflexive qualities (Semerari et al., 2003). In so doing, we use the term to describe a range of semi-independent capacities which allow persons to not merely process information, but to react to and think about their own mental states and those of others as they are confronted with information. However, our use of the term parallels the use of several other terms including Theory of Mind (ToM) and Mentalization and is related to some aspects of what is described elsewhere as social cognition. The term ToM usually refers to thinking about the thoughts of others (Brüne, 2005) and recent reviews (Bell et al., *in press-a*) note how this term covers different processes such as mental state detection and mental state reasoning while relating with others. As such, it is a highly meaningful aspect of metacognition but likely one part of a larger system which enables thinking about thinking. Another term which closely parallels metacognition is mentalisation (Fonagy et al., 2002). This construct differs from how we use the term metacognition, in that mentalisation mostly refers to understanding mental states in the context of an attachment relationship. We use the term metacognition, therefore, in keeping with its use in clinical literature (e.g. Liotti, 2002) but do so with the caveat that little is understood about how the different constructs we see subsumed under the umbrella of metacognition overlap with each other and to what degree these constructs reflect functions that can be impaired independently of one another in daily life.

Turning to the issue of outcome in schizophrenia, one issue raised by research on what we have referred to as metacognition, concerns whether certain forms of deficits in metacognition may represent a unique barrier to the recovery of function in schizophrenia. In other words, do deficits in metacognition form a unique barrier to wellness, independent of neurocognitive abilities, which are believed to also limit psychosocial function (Green, 1999; Lysaker et al., 2005b)? Evidence consistent with this possibility includes research suggesting that impairments in various capacities for metacognition are better predictors of concurrent assessments of social competence in schizophrenia than assessments of neurocognition or psychopathology (Bora et al., 2006; Brüne et al., 2007; Roncone et al., 2002). Additionally, at least one other study has also found that persons with schizophrenia with difficulties arranging a narrative account of their illness in a temporally coherent manner across time were rated as having a lesser capacity for social relatedness over time than those who could organize thoughts and feelings in a detailed and temporally consistent narrative (Lysaker et al., 2008a,b).

To investigate the link between metacognition and function, the current study has sought to examine the association of one specific domain of metacognition, self-reflectivity, and one domain of function, work performance. We chose to examine work performance as at least one study

has suggested that the measures of social cognition, constructs similar to those of metacognition, may mediate the impact of neurocognition on work function (Bell et al., *in press-a*, 2009). Self-reflectivity refers to the ability to be aware of and to connect one's own thoughts and feelings with one another and their antecedents. It also involves the ability to question our own thoughts and to distinguish fantasy from reality, for example, distinguishing a dream from a memory or an anticipated future (Semerari et al., 2003). We chose this domain of metacognition reasoning that perhaps more than other domains, it is essential, regardless of neurocognitive capacity, for regulating behavior and internal states. It could be hypothesized, for instance, that impairments in the ability to be reflective about one's own mental states might result in difficulties discriminating goals, plans and emotionally laden intentions, making it difficult to see why one should put forth effort especially when work has become difficult, confusing or emotionally upsetting. It might thus lead to a slower learning curve, largely independent of learning ability. Additionally, with a limited capacity to scrutinize one's thoughts and feelings, it might be difficult to learn about one's behavior in the abstract and to cope in an evolving and flexible manner in the face of continuous feedback at work.

As an illustration, consider Mr. Orange who has taken a new job in the cafeteria. Deficits in neurocognition might make it difficult for him to learn a specific skill (e.g. running the cash register) or inhibit a certain response (e.g. giving incorrect portions) once he has realized that he has been making errors (Lysaker et al., 2005b). Beyond that though, deficits in metacognition might be a barrier to Mr. Orange recognizing and managing feelings of embarrassment after ringing up the wrong food prices for a customer or to identifying internal or external factors that might be linked to having made that error. Without intact metacognition, Mr. Orange might not be able to discriminate paranoid ideation from innocuous body language of a customer or auditory hallucinations from the constructive verbal feedback offered by a supervisor. On the other hand, with intact metacognition, Mr. Orange might be more able to accurately interpret feedback from his supervisor and realize that making a mistake does not mean he is a worthless person. He might come to realize that he made the mistake because he was so anxious to please his supervisor and resultantly he did not pay attention to detail. Perhaps he could recognize that he tends to work too fast when the day is nearly over or that he made that error because he was distracted by an earlier conflict with a romantic partner. Consequently, he might be able to think about correcting that mistake in the future by focusing more intently on what he's doing or by managing his anxiety more effectively. He might be more likely to challenge the thought that he is worthless simply because he made an error.

To operationalize this issue, we divided a sample of adults with schizophrenia who had completed vocational rehabilitation into three groups: those who had been assessed as having high, medium and low levels of self-reflectivity on a measure of metacognition taken prior to entering work. The high self-reflectivity group contained participants who, prior to rehabilitation, were aware of their own thoughts and feelings and recognized that their ideas about the world were subjective and fallible. The medium self-reflectivity group

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