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CHAPTER

1

Metacognition in psychotic disorders: from concept to interventions

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ABSTRACT

Persons with a psychotic disorder commonly experience difficulties in metacognitive capacity or the ability to form and reflect upon ideas about themselves and others. This article reviews several definitions of metacognition, its role in psychopathology, as well as measurement strategies. This literature suggests that although definitions and instruments vary considerably, metacognition and related concepts are measurable. Clinical interventions intended to enhance metacognition are discussed along with the development of new forms of psychotherapy that aim to help patients suffering from psychotic disorders to improve metacognitive capacity.

INTRODUCTION

While research efforts over the last century have improved our understanding of psychotic disorders significantly, it is remarkable to what degree observations by key figures such as Bleuler and Kraepelin, have held up under scientific scrutiny (Moskowitz & Heim, 2011). Bleuler, for instance, introduced the ‘four a’s of schizophrenia’ in 1911: [loosening of] association, [inadequacy of] affect, ambivalence and autism (the latter referring to disruptions in emotional contact with others). Various authors (Aleman & Kahn, 2005; Moskowitz & Heim, 2011) have pointed out that Bleuler is frequently inaccurately viewed as denoting schizophrenia as an illness of thinking while he, in fact, emphasized the strong influence of affect on loosened associations. While terminology has changed significantly, observations such as these are consistent with calls to consider psychotic disorders as disorders in the ability to form mental representations of others (C. D. Frith, 1992), disorders in the adaptation to a social context (van Os, Kenis, & Rutten, 2010) or recently as neurologically rooted in disrupted communication between networks concerning the intrinsic and extrinsic self (Ebisch & Aleman, 2016). The ability to reflect on representations of the self (in which affect and cognition and their interactions are understood) and the representations of others, along with the ability to respond adequately to these reflections, possibly has a strong influence on the degree to which psychological symptoms influence daily life functioning. Some authors are using the term ‘metacognition’ to describe this capacity (Lysaker & Dimaggio, 2014). Terminology regarding ‘metacognition’ and related constructs (social cognition, Theory of Mind, mentalizing) is inconsistent, however, which may lead to confusion. Most, if not all, definitions refer to ‘thinking about

thinking’, but specifics differ significantly. In this introduction, we will first discuss several different conceptualizations of metacognition and related concepts. Subsequently, relevant measurement instruments will be discussed which may find use in clinical practice and research. Finally, different interventions intended to target metacognitive capacity in persons with a psychotic disorder will be discussed.

CURRENT DEFINITIONS OF METACOGNITION APPLIED TO PSYCHOPATHOLOGY

The term ‘metacognition’ was originally used in educational psychology, and defined as knowledge and cognitions about cognitive phenomena (Flavell, 1979). In the following decades the term came to be used in several different ways. Wells (2009) utilized a similarly cognitive-oriented definition: metacognition plays a role in the interpretation of thoughts, and the reaction following these interpretations (Wells & Cartwright-Hatton, 2004). Psychological difficulties, according to this definition, will generally develop when the content of the metacognition beliefs is dysfunctional, such as the belief that rumination causes one to be well-prepared. Moritz and colleagues (2011), who developed a metacognitive training for persons with psychotic disorders, follow an extension of this definition. While Wells *et al.* mainly emphasized the content of metacognitions such as the rumination about the own thought-content, Moritz *et al.* focus on the process of evaluation of thought processes, and identified several cognitive biases which appear more prevalent among persons with a psychotic disorder. They considered metacognition as the awareness of these biases, such as the jumping to conclusions bias, which causes one to draw conclusions and make decisions based on these conclusions before sufficient information has been gathered. Through an intervention in which participants are exposed to examples of these

biases, attempts are made to reduce the influence of these biases on behavior. In this conceptualization, metacognition takes the form of a control-process used to detect and potentially adjust a certain way of thinking. In the literature, metacognition is more frequently used as a control-process, using it to describe the post-facto confidence in decisions and error-detection (Cella, Swan, Medin, Reeder, & Wykes, 2014; Koren, Seidman, Goldsmith, & Harvey, 2006) or the sense of correctness of an answer (feeling of rightness, FOR; Thompson, Prowse Turner, & Pennycook, 2011). These conceptualizations share the common denominator that they refer in particular to thoughts about the own cognitive system, either by way of understanding the own thoughts, the own cognitive biases or exerting control over these processes.

Wells (2009), however, also focuses on affective experience; one example of difficulties in metacognition concerns a patient who is wondering specifically why she is feeling the way that she is feeling, and whether she should not be feeling differently. Similarly, the Metacognitive Training (MCT; Moritz *et al.*, 2011) attempts to address the impact of cognitive biases on Theory of Mind, by informing trainees of the impact of mood on the judgment of social cues. This connection with affect is unsurprising, since interactions between affect and cognition are constantly taking place (Clore & Huntsinger, 2007). One could argue that any complete definition of metacognition should also span emotional processes: thinking about thinking and feeling, sometimes also referred to as ‘mental states’.

There is significant support for the assumption that the ability to accurately interpret the mental states of others is at least related to the ability to accurately interpret one’s own mental states, both on theoretical grounds, as well as meta-analysis of fMRI results which confirm an overlap in regions of the brain activated when reflecting on oneself and reasoning about others (van Veluw & Chance,

2014). Furthermore, meta-analysis has established differences in brain activation between self- and other-reflection and it has been hypothesized that such differences are less pronounced in schizophrenia patients (van der Meer, Costafreda, Aleman, & David, 2010). There is also significant evidence for claims that these skills play a central role in social functioning (Roncone *et al.*, 2002).

There are several concepts which are, more or less, synonymous to (elements of) metacognition. Empathy refers to the ability to proverbially put yourself in another's shoes, and is generally split up into a cognitive and an affective component. The cognitive component refers to the ability to form a working model of the emotional states of others, while the affective component describes the ability to be sensitive to and vicariously experience the emotions of others (Reniers, Corcoran, Drake, Shryane, & Völlm, 2011). Inferring the mental states of others is also commonly referred to as Theory of Mind (Brüne, 2005) or as a component of mentalizing (C. D. Frith, 1999), with each of these concepts often divided up into a cognitive and an affective component. The concepts are related to such a degree that authors frequently use the terms interchangeably (e.g. Fonagy, Bateman, & Bateman, 2011).

AN INTEGRATIVE DEFINITION OF METACOGNITION

While many definitions of metacognition have emphasized disturbances or errors in discrete thoughts leading to the perturbation of affect, Semerari *et al.* (2003) and Lysaker *et al.* (2005) have described metacognition as a spectrum of activities, which also involves the integration of information into more complex senses of self and other. This conceptualization frames metacognitive processes as playing a central role in how human beings understand themselves and others from a larger frame. Specifically, this integrative model uses metacognition as an umbrella term, consisting of four semi-independent

subdomains originally defined by Semerari *et al.* (2003): self-reflectivity, understanding the other's mind, decentration and mastery (Table 1). Each of these domains includes a range of activities which include more discrete activities (e.g. recognizing a thought) to more synthetic activities (integrating information into a complex self-representation). Applying this model to psychosis, Lysaker *et al.*, (2005) have proposed that

“Self Reflectivity”: Refers to the awareness of one's own thoughts, intentions and emotions, and the ability to form a complex and integrated sense of self on the basis of that information. Lower levels of self-reflectivity involve the recognition of different forms of basic mental states while higher levels of self-reflectivity reflect the ability to recognize psychological patterns across their life, synthesizing multiple narrative episodes into a coherent and complex narrative which integrates different modes of cognitive and/or emotional functioning.

“Understanding the Other's Mind”: Refers to awareness of the mental states of others including their thoughts, intentions and emotions and the ability to form a complex and integrated sense of another person on the basis of that information. Lower levels of understanding the other's mind involve the recognition of different forms of basic mental states while higher levels of this function involve the ability to form an integrated idea of another person's mental states across multiple narrative episodes into a coherent narration.

“Decentration”: Refers to the ability to see the world as perceivable from multiple valid perspectives. Lower levels of decentration involve being able to understand that events in the world can take place for reasons which are unrelated to the person. Higher levels of decentration reflect the ability to recognize that the events that occur in regular life are often the result of complex emotional, cognitive, social, and environmental factors which vary according to the individuals involved.

“Mastery”: Refers to the ability to use metacognitive knowledge to respond to psychosocial challenges. Lower levels of mastery involve the ability to name a plausible psychosocial challenge. Moderate levels involve the ability to change thoughts or behaviors in response to psychosocial challenge while higher levels involve the ability to use unique knowledge of oneself, others and the larger community to respond to psychosocial challenges and live with the realities of the human condition.

metacognitive functions have a hierarchical nature such that specific functions are required for higher level functions to be performed. For example, one is presumed unable to consider the interaction between an emotion (feeling hopeless) and accompanying thoughts (“I am worthless”) without both a basic understanding of one’s own cognitive processes and the ability to differentiate between emotions.

Applied to psychosis, disruptions in metacognition are proposed to leave persons unable to form complex ideas about themselves and others on the basis of discrete information. As a result, people may find it difficult to understand the world around them and to see themselves as active agents who can effect changes in their own lives, ultimately compromising social function. Additionally, persons may also be relatively unable to use knowledge of themselves and others when responding to psychosocial challenges leading to increased levels of prolonged distress, demoralization and withdrawal.

The integrative conceptualization of metacognition does not deny the importance of the content of discrete cognitions or abilities to correctly perceive elements of social exchange. It does add, however, a larger issue which concerns the integration of discrete data into larger-scale representations of oneself, others and the world. Inherently, this synthesizing of information is not in itself correct or incorrect, but is an ongoing system of meaning making, in which metacognitive capacity is considered both an automatic and effortful process. Discrete and synthetic forms of metacognition are believed to mutually influence one another, as more complex ideas require constituent parts and discrete pieces of information are generally interpreted on the basis of our later ideas of ourselves and the world. This process may be compromised in different ways and to different degrees, leading to different forms of difficulties of adaptation and thus, potentially, either producing psychopathology or making it difficult to manage different forms of psychopathology.

MEASUREMENT INSTRUMENTS

Metacognition can be measured in several different ways. What follows is a small selection of instruments which, while not comprehensive, offers some notion of the variety of tools available to clinicians to measure different aspects of metacognition. The first type of measurement instruments consists of self-report questionnaires, positioned mainly at the cognitive, discrete side of these domains. One oft-used instrument of this type is the Meta-Cognitions Questionnaire (MCQ; Wells & Cartwright-Hatton, 2004), consisting of 65 or 30 items answered on a 4-point Likert-scale. The items of the MCQ are intended to identify the beliefs about one's own cognitions, with questions such as: "Worrying helps me to get things sorted out in my mind". Both the MCQ and MCQ-30 have sufficient psychometric qualities and correlate, among others, with the severity of auditory hallucinations (Morrison & Wells, 2003) and anxiety and depressive symptoms in schizophrenia (van Oosterhout, Krabbendam, Smeets, & van der Gaag, 2013).

Pertaining cognitive biases, the Davos Assessment of Cognitive Biases (DACOBS; Bastiaens *et al.*, 2013) uses 70 items to measure four cognitive biases (jumping to conclusions, confirmation bias, attention to threat and external attribution bias) as well as subjective cognitive difficulties, social-cognitive difficulties and avoidance behavior. The DACOBS has good psychometric qualities and can accurately differentiate between persons with a diagnosis in the psychosis spectrum and controls (van der Gaag *et al.*, 2013). Questionnaires such as these may form a solid basis to guide cognitive (behavioral) interventions intended to target metacognitions, or group training (discussed later).

Questionnaires mostly aimed towards metacognitive capacity pertaining the mental states of others frequently intend to measure the construct of empathy, such as the Interpersonal Reactivity Index (IRI; Davis, 1983). This questionnaire measures the construct of

empathy on four subscales, using 28 items. The IRI has demonstrated sufficient psychometric qualities, and has seen ample use in research, but is exclusively focused on empathy. An instrument with a solid basis of correlations with behavioral and physiological measures is the Measure of Emotional Empathy (Mehrabian & Epstein, 1972). This questionnaire consists of 33 items to be answered on a 4-point Likert Scale. Correlations have been found between this measure and reduced insight in psychosis (Pijnenborg, Spikman, Jeronimus, & Aleman, 2013).

The Toronto Empathy Questionnaire (Spreng, McKinnon, Mar, & Levine, 2009) was constructed based on factor analysis of other frequently-used measures of empathy, resulting in 16 items with excellent psychometric qualities. Crucially, during its development, the authors forced items to load onto a single factor so as to create a scale to measure empathy as a unidimensional construct. Clinicians or researchers seeking to investigate cognitive and affective empathy as separate constructs could use the Questionnaire of Cognitive and Affective Empathy (QCAE; Reniers *et al.*, 2011) which was recently developed from items of other instruments, and validated.

The broader construct of ‘social cognition’ and ‘Theory of Mind’ are generally not measured using questionnaires, but make use of behavioral tasks. On the more discrete side of activity, emotion recognition is generally measured by asking participants to interpret photographs of facial expressions or photos (e.g. the Ekman 60-faces) or of eyes alone (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001), and indicate which emotion or word best relates to what the person is feeling. More synthetic tasks consist of stories in which the participant is asked whether a character committed a socially-undesirable act, or ‘faux pas’ (Baron-Cohen, O’Riordan, Stone, Jones, & Plaisted, 1999), tests in which participants are asked to infer the intentions

of others (Corcoran, Mercer, & Frith, 1995) and tasks in which the participant has to determine whether one character has a false belief about the location of a ball, or has to put images of a story in the most logical order. Particularly relevant, in this context, are the recent results of the Social Cognition Psychometric Evaluation (SCOPE) study, in which several measures of social cognition were entered into a confirmatory factor analysis (Browne *et al.*, 2016). Data analysis in which results from control participants without a psychiatric diagnosis (n=104) are compared to scores of a sample of persons with a diagnosis of schizophrenia (n=179) indicates the existence of a single-factor social-cognitive ability. The authors note, however, that the measures investigated are only those with answers that can be classified as correct or incorrect, and as such measure social-cognitive skill (discrete abilities), and that future work is needed on individuals' abilities to synthesize such information into complex representations which help a person function in the world around them.

One avenue in which these abilities may be studied is through the construct of metacognition as operationalized by Semerari *et al.* (2003), who developed the Metacognition Assessment Scale (MAS) to measure the more synthetic metacognitive activities. This instrument was adapted by Lysaker *et al.* (2005) to be used with persons with a diagnosis in the psychosis spectrum, assuming a hierarchical structure to metacognitive functions. The MAS-A is based on the original four domains proposed by Semerari *et al.*: self-reflectivity, understanding the other's mind, decentration and mastery. Each scale is hierarchical, and consists of multiple levels, each with anchor points. Using the MAS-A, transcripts of conversations with a person may be scored on metacognitive activity, and as such, the instrument lends itself for scientific research as well as a form of routine outcome monitoring, monitoring progress within a therapeutic context (Buck & Lysaker, 2009). The instrument has

demonstrated sufficient psychometric qualities, and can differentiate between patients with a diagnosis in the psychosis spectrum and controls, given sufficiently-trained raters (Lysaker *et al.*, 2014). The measure has a rather unique level of ecological validity: metacognitive capacity is rated on what the participant actually demonstrates in the moment, when discussing their own lives, although the measure in its current form has severe limitations in application. Most saliently, the measure requires the speech samples (interview, or therapy session) to be fully transcribed – a time investment most healthcare professionals (and researchers) will be hard-pressed to be able to commit to. Of note, the original authors of the MAS have developed a new method, the MAS-R, which does not assume a hierarchical structure and which has been applied to at least one first episode sample (MacBeth *et al.*, 2016).

METACOGNITION AS A TARGET FOR THERAPY

Several interventions based on the different conceptualizations of the construct have been developed. Perhaps most well-known is the method developed by Wells and colleagues (Wells, 2009), which was initially aimed at anxiety and depression, but has demonstrated transdiagnostic utility, making it suited for application with other disorders such as PTSD (Wells & Colbear, 2012) and psychotic disorders (Morrison *et al.*, 2014). Although the therapy is grounded in a cognitive model, and is commonly considered a variant of Cognitive Behavioral Therapy, it has a distinct feature: more attention is spent on the process of thinking than on the content of thoughts. For instance, when the therapy pertains rumination, earlier sessions will generally be focused on measuring metacognitive beliefs. Only in later sessions are thought experiments (ruminating in the moment) and behavioral experiments conducted in a way common to CBT. Meta-analysis shows promising results for anxiety and depression (Normann, van Emmerik, & Morina, 2014),

though the authors themselves note that their analysis is conducted on a small sample. As such, interpretation of the results should be undertaken with the necessary caution. A preliminary trial with ten patients with a psychotic disorder showed a reduction of experienced symptoms, and a randomized controlled trial seems desirable (Morrison *et al.*, 2014).

To adjust (meta)cognitive biases persons with a psychotic disorder frequently suffer from, a metacognitive training (MCT) was developed (Moritz *et al.*, 2011). This training consists of eight modules and is freely available in different languages. The developers themselves consider the training as a combination of CBT and cognitive remediation, which targets symptoms by addressing underlying processes. Meta-analysis, however, does not find any influence of MCT on positive symptoms, delusions or the jumping-to-conclusions bias (Oosterhout *et al.*, 2015).

Cognitive Behavioral Therapy (CBT) has been undergoing a small, but significant, paradigm-shift: although it has always contained elements of metacognition in that cognitions are jointly evaluated, these elements are starting to move more towards the foreground (Dobson, 2013). Metacognition is a central element in so-called third-wave therapies. Perhaps most widely known is Acceptance and Commitment Therapy (ACT). The basis of this therapy is the hypothesis that human suffering is generally not an expression of psychiatric disorder, but is part of life in general. It is the response to suffering which is addressed in therapy, by adjusting how one thinks about the suffering by addressing value judgements (“I may not have these feelings”) or intentions of will (“I have to get rid of these problems as quickly as possible”) (Yovel, Mor, & Shakarov, 2014). A recent meta-analysis of 60 RCT’s investigating ACT as a method, shows a small to medium effect size. Due to the heterogeneity – unexplained variance between studies – the data currently available can only attest that ACT possibly has an effect on psychotic symptoms, but the quality of studies is low and better trials are desired (Öst, 2014).

Finally, there has been an increase in psychotherapeutic approaches which are based on the synthetic conceptualization of metacognition, and the recovery movement. Generally, such approaches are based on either the model of metacognition depicted in Table 1, developed by Semerari *et al.* and Lysaker *et al.*, (Semerari *et al.*, 2003) or the comparable, though more psychodynamic-oriented model of mentalization (Bateman, Fonagy, & Allen, 2009). Several such interventions exist, with as common factors the narrative – the (re) construction or evaluation of the story of the patient’s life, and activities in which the therapist and patient think together about the experiences of the patient and the therapeutic relationship, so as to stimulate metacognitive capacity (Hamm, Hasson-Ohayon, Kukla, & Lysaker, 2013). Where CBT generally has a focus on discrete elements such as specific symptoms or the interpretation of problematic states, these psychotherapies focus on the more synthetic activities such as forming representations of the ‘self’, and the metacognitive activities required for a person to place themselves in time, the social context and the world (Lysaker & Roe, 2012). Evidence for the effectiveness of such activities is relatively sparse and comes mainly in the form of case studies (e.g. Lysaker, Buck, & Ringer, 2007; Salvatore, Russo, Russo, Popolo, & Dimaggio, 2012). More recently, one method was investigated in a pilot study with 18 participants, in which participants improved on measures of subjective recovery and received increased scores on the self-reflectivity subscale of the MAS-A (Bargenquast & Schweitzer, 2013). Our own research team has recently added two case studies with positive results (de Jong, S., van Donkersgoed, R.J.M., Pijnenborg, G.H.M., & Lysaker, 2016; van Donkersgoed, de Jong, & Pijnenborg, 2016). Both of these cases concern patients with symptoms generally considered difficult to treat – severe disorganization and heavy negative symptoms, respectively. The latter case study can be found in

this dissertation in Chapter 4. The protocol used in these case studies is the so-called Metacognitive Reflection and Insight Therapy (MERIT) treatment manual, developed in English by Lysaker *et al.* One major component of our research team's efforts have been to evaluate this novel method, and in order to do so the manual was not only translated, but also heavily adapted to suit the Dutch context and therapists. The protocol was first tested in a pilot study, in which only two therapists (SJ and RvD) worked under supervision from PL and MP in the treatment of 12 participants with a psychotic disorder. The positive findings, reported in Chapter 5, informed the design of the randomized controlled trial reported in Chapter 6.

It is relevant to note that interventions such as these put a (high) cognitive demand on clients. As such, it may prove difficult to attain therapy success with those patients that suffer from (comorbid) disorders in cognitive or neurobiological functioning.

CONCLUSION

There are different ways in which metacognition may be conceptualized and defined. Each conceptualization and accompanying methods of measurement have a solid foundation in scientific evidence and psychometric qualities. One integrative definition of metacognition can be found in the works of Semerari *et al.* (2003) and Lysaker *et al.* (e.g. 2005). This model divides metacognition into four domains, and places processes on a spectrum, from more discrete activities (e.g. recognizing a thought in one's own head, or identifying the presence of any kind of intrapsychological stress) to more synthetic activities (such as forming complex representations of self and others, or one's own psychological coping). This model should not be considered a replacement of other, previous models, but may prove useful to place the different concepts into a larger whole. Using this model of

metacognition is particularly useful when the object of study is the more synthetic component of metacognitive capacity, which is under-researched at the moment due to a lack of instruments of measurement. This does, however, come at a trade-off: where more discrete-oriented instruments offer great detail regarding a singular process (e.g. the recognition of negative-affect facial expressions), the MAS-A offers a broader, less detailed view of the process as a whole.

Metacognitive capacity appears impaired in persons with a psychotic disorder. Several measurement instruments have been developed which pertain some form of metacognitive capacity, which have demonstrated good clinical utility. In addition, different therapies have been developed in an effort to assist persons (re)gain metacognitive capacity (Hamm *et al.*, 2013). Most of these interventions require more research, in the form of randomized controlled trials and meta-analyses which bundle these findings, before one may speak of an evidence base robust enough to be entered into international guidelines. Several such studies are underway: one randomized trial being conducted investigates mentalization-based therapy (Weijers *et al.*, 2016), another one explores an approach based on the MAS-A model (Van Donkersgoed *et al.*, 2014) or a version of the metacognitive training adapted for individual use (Vitzthum, Veckenstedt, & Moritz, 2014).

OVERVIEW OF THIS THESIS

The introduction of this thesis explores a relatively novel conceptualization of the term ‘metacognition’, broadly within the field of ‘social cognition’. Terminology in the field has, as it would seem, become rather muddled, with different terms and conceptualizations overlapping in certain areas, and not in others. Different conceptualizations also vary in resolution, with terminology ranging from very broad sets of capacities involved (‘theory of mind’) versus far more concrete, detailed expressions (‘second-order Theory of Mind’). Or, as the model under discussion would put it: discrete activities versus more synthetic activities.

Using a model with a larger scope inherently reduces its resolution, opting to specify a larger whole rather than taking a narrow view of its component parts. The current thesis takes a pragmatic approach to the topic, and seeks to investigate in which ways such a model can find clinical and research applications, but also to investigate its inverse: what its limitations are. In order to do so, the second chapter approaches metacognition as a correlate for relevant outcome measures, investigating the influence of metacognitive deficits on the experience of work and how these interact with different adjunctive treatment.

The third chapter investigates the possible influence of metacognitive deficits on the risk of violence in psychosis. By including scores from a control population, an effort is made to determine whether metacognition has a unique contribution to the risk of violence over and above deficits commonly found in participants with a diagnosis in the psychosis spectrum.

In part two of this thesis (Chapters 4 – 6), metacognition is studied as the basis for a psychosocial intervention, in the form of an individual psychotherapy manual. Chapter four will discuss the case of Abraham; a case study demonstrating promising results with a participant with

such severe symptoms of disorganization that they may pose a severe obstacle in the application of current treatments listed in international guidelines.

The fifth chapter will discuss a pilot study conducted in preparation for the multicenter, randomized controlled trial we performed to investigate the effects of this same treatment manual. Our findings from this trial are reported in Chapter 6 of this thesis.

The seventh and final chapter will consist of a general discussion in which the findings of all aforementioned studies are combined. Strengths and weaknesses of this conceptualization of metacognition will be discussed, and suggestions for further research will be made.

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