Metacognition, affect regulation and symptom expression: A transdiagnostic perspective

Andrew Gumley *

Academic Unit of Mental Health and Well-being, Institute of Health and Well-being, University of Glasgow, Academic Centre, Gartnavel Royal Hospital, Glasgow, G12 0XH, UK

ABSTRACT

The editors of this special section commissioned this commentary to bring together some of the conceptual, empirical and measurement issues arising from this series of articles. This commentary explores metacognition in relation to its neurobiology, and diverse syndromes and clinical phenotypes, including schizophrenia, alexithymia, and personality disorders, as well as its relation to assessment and prospects for the further delineation of mechanisms of change in psychological therapy.

© 2011 Published by Elsevier Ireland Ltd.

Man is not an animal, Is intelligent flesh, Although sometimes ill

Fernando Pessoa (1935)

1. Introduction

It seems reasonable to assert that a fundamental aspect of our humanity is our *capacity* to attune to our own minds, the minds of others and make use of our mind-mindedness to accommodate our own and others' needs, plans and intentions. Following from this, these capacities enable us to negotiate and resolve intrapersonal and interpersonal conflicts in desires and goals in sophisticated ways that seem so typical for our species. Through understanding our own and others' minds, we are able to enter into pretend modes of functioning that enable us to take the perspective of others, share their joy and happiness as well as their pain and distress. Thus, we can be moved to help and support those around us, to express care, love, respect, sympathy and compassion. Indeed our *utilisation* of these capacities to alleviate distress in others moves beyond simple bonds of family and community, towards helping other human beings and other species. Basic information, such a gaze, posture, facial expression, voice tone and volume, provide us with subtle (and sometimes not so subtle) signals of the well-being, intentions, needs, emotions and states of mind of individuals around us. As we respond to and interpret these signals, we adjust our own behaviour and response, often accommodating those around us. This constant daily interplay between multiple states of mind is remarkable in light of the day to day pressures we face getting onto crowded buses, subways, and trains, requiring the inhibition our own irritability and frustration. We might stop to help a mother lift her child's pram onto the bus; after a long day and despite our tired legs, we might give up our comfortable seat on a subway to an elderly man we've never seen before and may never see again. All these things happen on a daily basis without ever a word passing between us. Each day we co-operate with a community of others with whom we share scarce resources (Hrdy, 2009). At the same time we can also deploy our capacities for mental state understanding in the services of other interpersonal and evolutionary priorities (Liotti and Gilbert, 2011). Understanding the mental states of others enables us to anticipate the actions of others including their errors. In this way we can compete, exploit weaknesses, outwit and defeat our opponents. Alternatively, we can anticipate and attend to threats from others and defend ourselves against attacks to our psychological and physical integrity. It is also in our capacities to appreciate and understand the cognitive and emotional states of others where the darkest aspects of our humanity reside, that is, in our utilisation of mental state information to exploit, manipulate and hurt others for our own selfish goals.

Therefore, we understand three key aspects of this analysis. First it acknowledges our *capacities* for metacognition and mentalization. Second, it acknowledges our *utilisation* (how and when we use and apply these competences) of these capacities. Finally, these capacities can be utilised in the service of separate and distinctive *evolutionary priorities* including affiliation, competition and threat. Based on this

* Corresponding author. Tel.: + 44 141 211 3927.
  E-mail address: Andrew.Gumley@glasgow.ac.uk.

understanding, we can conceptualise symptoms as an expression of processes of adaptation within which metacognition is at the heart of where psychopathology might be best understood in terms of the interplay between metacognitive capacities and competences, the utilisation of these competences, and the overarching social mentalities governing their deployment.

2. Metacognition and complex mental health problems

Dimaggio, Nicolò, Brüne and Lysaker, the guest editors of this special section, have brought together a stunning collection of articles from respected researchers and clinicians around the globe to deliver a body of work concerning the key role of metacognition in adult psychiatric and psychological problems. This is an important and growing domain of research, which has the potential to revolutionise our understandings of the expression of psychopathology and the alleviation of emotional and interpersonal distress. A crucial aspect of Dimaggio and colleagues' volume is the recognition that metacognition is a transdiagnostic process, which has much to tell us about the unfolding of symptoms over time and candidate mechanisms of change in recovery (whether this recovery is assisted or unassisted).

Metacognition (the concept of which overlaps with Mentalization and Theory of Mind as used in this section) has been variously defined as the capacity to conceive of one's own and others' mental states as explanations of behaviour (Fonagy and Target, 2006); the cognitive ability to attribute mental states such as thoughts, beliefs and intentions to people, allowing an individual to explain, manipulate and predict behaviour (Sprong et al., 2007); or the ability to think about one's own inner states, and the inner states of others, allowing for complex self-experience and coping with distress (Semerari et al., 2003). Whilst these various definitions of metacognition appear to reflect a degree of commonality in approach, this masks significant complexity and differences in the underlying disorder-specific models of metacognition. Brüne et al. (2011-this issue) have argued that in the absence of an agreed definition of metacognition there is agreement that a wider definition of metacognition involves the perception and processing of social signals to construct representations that flexibly guide social behaviour, and that more narrowly defined definition of metacognition represents the ability to form and manipulate mental representations of one's own and others' mental experiences, which includes beliefs, desires, intentions, feelings and dispositions.

Disruption in the capacity for or utilisation of metacognition has far-reaching consequences for an individual's self-experience and functioning in the interpersonal environment (Brüne et al., 2011-this issue). This is crucial since at the heart of many forms of adult psychopathology the impairments of social functioning (as in those diagnosed with schizophrenia; see Lysaker et al., 2011a,b,c-this issue), interpersonal functioning (as in those diagnosed with personality disorders; see Carcione et al., 2011-this issue) and affective functioning (as observed in alexithymia; see Vanheule et al., 2011-this issue) are likely to be strongly linked to metacognition. Simultaneously we can also observe disturbance of affective expression with the diminution of positive and negative affect observed in schizophrenia (Stratta et al., 2011-this issue), cognitive disorganisation in schizophrenia (Lysaker et al., 2011a,b,c-this issue) or the overregulation of affect observed in alexithymic and personality disorders (Nicolò et al., 2011-this issue). Of course, these observations of the expression of psychopathology (reflected in social, interpersonal and affective functioning) in adulthood should not be regarded as separate or compartmentalized by diagnosis. In this sense, diagnosis might be regarded as a marker of symptom expression. Diagnosis may therefore create artificial boundaries between forms of human distress that have common mechanisms and shared developmental pathways (Gumley, 2010). An important implication of this is the exploration of neurobiological mechanisms of metacognition.

3. Neurobiology of metacognition

Brunet-Gouet et al. (2011-this issue) specify three levels of processing relevant to metacognition. At the basic representational level of social information, we can consider the inputs we experience from the external environment (such as others' gestures, facial expressions, and speech utterances) or from the internal environment (internal cognitive, affective, physiological and kinaesthetic events, as well as our own actions and reactions). At a second level for these inputs to have salience, the events must activate corresponding internal associated representations stored in episodic/procedural or semantic memory. In this model, metacognition represents a higher-level executive mechanism involved in managing multiple aspects of representations that are concurrently activated by inherently complex everyday social interactions. In this context the "*mentalizing process thus acts on the set of activated representations (or enables retrieval of additional representations from memory) and allows their sequencing, contextualization, selection, and inhibition of prevalent representational properties in order to reach the most likely inference*". In keeping with this higher order function of mentalization, Raposo et al. (2010) explored patterns of functional magnetic resonance imaging (fMRI) activation associated with different types of mentalizing tasks that were focused on *Self*, *Other* and the relationship between self and other (*Relational*). They found that *Relational* mentalizing was associated with increased activation of the lateral frontopolar cortex (FPC) relative to mentalizing tasks involving *Self* only. Tasks involving *Other* relative to *Self* demonstrated medial but not lateral FPC activation. These findings suggested functional dissociation of mentalizing skills along the medial-lateral axis of the FPC. Therefore, mentalizing is more than just understanding the self and understanding the other but is also understanding the intersubjectivity of self-other relatedness. Brunet-Gouet et al. (2011-this issue) have called for an integrated model of social cognition based in neuroscience. Their Theory of Shared Representation (based on Decety et al., 2007) proposed that these representational systems each have corresponding underpinning neurobiological mechanisms. For example, a growing number of fMRI studies have shown that the observation of pain in others is mediated by several brain areas that are implicated in processing the affective and motivational aspects of pain. Jackson et al. (2005) found that the anterior medial cingulate cortex (aMCC) and the anterior insula are closely involved in the coding of motivational-affective dimensions of pain. Level of activity within the aMCC was strongly correlated with ratings of imagined pain in oneself and others, suggesting that common neural circuits are involved in representing one's own and others' affective pain-related states.

This link between social cognition, neurobiological organisation and brain development is crucial. Metacognition is regarded as an evolved mental capacity designed to enable primates and particularly humans to function in complex social environments requiring the development of affiliative and affectional bonds and necessitating competition for resources (Brüne and Brüne-Cohrs, 2006; Fonagy and Target 2006). Evolutionary approaches map metacognition closely to brain development and organisation. Brüne and Brüne-Cohrs (2006) concluded that theory-of-mind tasks appear to map onto a neural network comprising the temporal lobes, the inferior parietal cortex, and the frontal lobes. Saxe and her colleagues (Saxe and Wexler, 2005; Saxe et al., 2006) have found a role for the right temporoparietal junction for performance on theory-of-mind, self-reflective and autobiographical memory tasks, which is consistent with the developmental evidence on the inter-relationships amongst these functions. Fonagy et al. (2007) have suggested that the brain structures underpinning social cognition are also implicated in emotion processing and suggest that a two-component model of metacognition based on implicit (automatic) and explicit (reflective and controlled) processing systems with separate but related underlying neurobiological systems. Metacognition-based approaches to schizophrenia have tended to emphasise the cognitive components of theory of mind, that is, those

systems involved in belief reasoning, whereas in mentalization-based approaches to personality disorder the emphasis has been on affect regulation and emotional reflectivity. Baron-Cohen's (2005) model and the evidence from colleagues (Saxe and Wexler, 2005; Saxe et al., 2006) allows us to consider developmentally the evolution of mentalization in the early years of life and its possible role as a risk factor for the development of problems diagnosed as Schizophrenia or personality disorders.

Fonagy and Target (2006) have argued that secure attachment during infancy and childhood offers a major evolutionary and selective advantage in the development of social intelligence and, in this sense, attachment is the organiser of physiological and brain regulation. Fonagy and Target have proposed that the ability to understand the self and others as mental agents grows out of interpersonal experience. Our experience of ourselves as having a mind emerges in infancy and evolves through childhood, and the development of our self-reflective functioning and interpersonal awareness depends on our interaction with others' minds. In this sense the presence of others who are responsive and attuned, and who provide a context for us to experience safeness and to explore the external and our internal world, fosters the development of metacognition and mentalization.

Brunet-Gouet et al.'s (2011-this issue) call for an integrated model of social cognition based in neuroscience is an important statement in this special section of *Psychiatry Research*, and a key challenge is to consider an account from both developmental and evolutionary viewpoints on the emergence of capacity for metacognition and the way in which early adverse experiences may impair the development of metacognition, thus compromising resilience to adapt to and cope with stressful life events. For example, in a recent study by Shannon et al. (2011), performance on measures of episodic narrative memory tasks was explored amongst 85 individuals diagnosed with schizophrenia. After controlling for IQ and depression, Shannon et al. found that those individuals who had experienced childhood trauma ($n = 38$, 45%) performed significantly more poorly on tasks of episodic narrative memory. Lysaker et al. (2011a,b,c), found that individuals diagnosed with schizophrenia who had experienced sexual trauma had impairments in awareness and understanding of emotions in others. Hoy et al. (2011) found that childhood trauma was a significant predictor of right and total amygdalar volumes, and the hippocampal/amygdalar complex volume as a whole. The key point here is that in developing a neuroscience-based account of metacognitive functioning, we need to incorporate the important role of developmental and interpersonal experiences in the organisation, development and regulation of the brain and its functions. The potential pathways are complex. One potential explanation of these findings is that the route between trauma and impaired metacognition is via the direct impact of trauma on brain structure. However, this explanation does not allow for the importance of resilience amongst those who experience trauma but do not necessarily have impaired metacognition. Therefore, one might argue that a key mediator between trauma and both impaired metacognition and changes in brain functioning is unsuccessful coping. For example, avoidant coping styles may function to protect individuals from connecting with painful memories and experiences, but with the unintended consequence of such insecure coping styles in the diminution of metacognitive functioning and affect regulation capacities (Gumley et al., 2010; Lysaker et al., 2011a,b,c-this issue).

4. Metacognition and schizophrenia

One understanding of metacognitive problems is that they may arise from capacity limitations. A series of studies have shown that amongst individuals with a diagnosis of schizophrenia, there are impairments in understanding one's own mind, understanding others' minds, Decentration (reflecting the awareness that others have lives, interests and motivations separate from their own and that the person is not at the centre of others' actions, feelings and intentions) and Mastery (Lysaker et al., 2005, 2007, 2008, 2010, 2011a,b, this issue). These studies have shown that impaired metacognition was associated with poorer premorbid functioning and neuropsychological impairments, particularly reduced processing speed (Lysaker et al., 2005), deficits in executive functioning as measured by the Wisconsin Card Sorting Test and the Delis-Kaplan Executive Function System (Lysaker et al., 2007 and Lysaker et al., 2008, respectively) and to rehabilitation success over 6 months where lower levels of metacognition are linked to lower improvement in hours worked (Lysaker et al., 2010). The articles in this section extend our understandings of metacognition through exploring their association with social functioning, metacognition in non-chronic samples of individuals recovering from psychosis and the stability of metacognition over time. In this way we are able to observe the functional importance of metacognitive problems and gain insight into the possibility that metacognitive impairments unfold over time and are not static or trait-like.

In this section, Brüne et al. (2011) explored the relationships between mental state attribution, neuropsychology, symptomatology and social skills in a sample of 69 people diagnosed with schizophrenia and 49 controls. Mental state attribution was assessed using two tasks. One fascinating aspect of this study was the methods used to assess mental state attribution. Brüne and colleagues used a series of cartoon stories depicting differing interpersonal scenarios representing distinctive social mentalities. The scenarios involved co-operation between two characters—deception of one character by another;, and the co-operation of two characters at the cost of a third character. Importantly, this task showed greater predictive power compared to more traditional measures of mental state attribution utilising picture-sequencing tasks. They found that mental state attribution was the best cognitive predictor of social skills, and executive functioning did not mediate this effect. When measures of psychopathology were included the regression, levels of disorganised and negative symptoms predicted large proportions of the variance in social skills. In this model mental state attribution continued to be a significant predictor of social skills.

Lysaker et al. (2011a,b,c) explored the temporal stability of three assessments of theory of mind (ToM) in a study of 36 individuals diagnosed with schizophrenia. These tests were the Hinting Test (Corcoran et al., 2005), the Bell–Lysaker Emotional Recognition Task (BLERT; Bell, et al., 1997; Bryson et al., 1997) and the Reading the Mind in the Eyes Test (Baron-Cohen et al., 2001). All three tests were moderately correlated with one another. ToM scores at baseline were moderately correlated with ToM scores at 6-month follow-up ($r_{\text{range}} = 0.54$–0.59). Interestingly, Lysaker and colleagues interpreted these data as suggesting that metacognitive deficits reflect trait features of the illness. However, these correlations indicate shared variance of between 27% and 35%. Alternatively, these data may also suggest lack of stability in ToM performance, and the possible factors that influence the unfolding of ToM over time are of great interest. In addition, they also found that ToM was not correlated with self-reflectiveness as measured by the Beck Cognitive Insight Scale (BCIS; Beck et al., 2004). BCIS self-reflectiveness was associated with heightened emotional discomfort. The combination of ToM and BCIS self-reflectiveness predicted disorganisation symptoms at follow-up. These measurement differences between ToM and BCIS scores may reflect differences arising from implicit (automatic) and explicit (reflective and controlled) processing systems (Fonagy et al., 2007) where self-report measures access semantic representations that may be inconsistent with tasks accessing procedural or episodic memory.

In light of the findings of Lysaker et al., the study by Achim et al. (2011-this issue) is of particular interest. In an important study, they explored empathy in 31 individuals with a first episode of psychosis (FEP) and 31 matched controls using the Interpersonal Reactivity

Index (IRI; Davis, 1980). The IRI provides a measure of both cognitive empathy (including taking others' perspectives and imagining oneself in fictional situations) and affective empathy (including feelings of empathic concern and personal distress). They also explored performance on a ToM (picture arrangement) task. Whilst the FEP group reported significantly more IRI Personal Distress, the effect sizes for differences between FEP and control subjects for Cognitive Empathy and Empathic Concern were small and non-significant. Empathic concern was significantly correlated with performance in ToM. The FEP group had significantly better scores on perspective taking compared to pooled data from chronic schizophrenia (duration of illness between 10 and 11 years) comparison groups using the IRI. Achim et al. interpret these data as suggesting that the pattern of observed cognitive empathy ratings is compatible with the idea of a deterioration of the cognitive component of empathy with increased duration of illness. Together, these reports (Achim et al., 2011-this issue; Lysaker et al., 2011a,b,c-this issue) underline the need for longitudinal studies exploring the unfolding of metacognition over time and its relationship to key predictors mediating or moderating the expression of metacognition over time.

In addition we can also consider the hierarchical organisation of metacognition as discussed in Stratta et al. (2011). This hierarchical understanding of metacognition represents a developmentally and evolutionarily orientated conceptualisation of mental state understanding. Stratta and colleagues explored the hierarchical organisation of ToM in people with a diagnosis of schizophrenia by exploring the pattern of performance of individuals with a diagnosis using first order and more complex second order ToM tests. Of their 42 participants, 37 (88%) had test results consistent with a hierarchical organisation. However, it was also fascinating that this group identified a small number of individuals ($n = 5$, 12%) who were unable to complete first order tests but completed second order tests successfully. Given that this number is above the $p < 0.05$ threshold, this finding of discontinuities in the organisation of metacognitive abilities requires further investigation.

Together, this group of studies is fascinating because the studies confirm the clinical and functional importance of metacognitive functioning in people with a diagnosis of schizophrenia. It is also important that many of the results showing deficits in metacognitive functioning and associations with poorer performance on neuropsychological tests are taken from samples of older middle-aged chronic samples. Therefore, the finding of Achim and colleagues is of great interest. Are impairments in reflexivity less apparent in the first episode, or do differences in findings reflect differences in measurement (see measurement discussion below)? One understanding may be that metacognitive impairments in people with psychosis are progressive over time and may reflect a number of mechanisms including neurobiological progression of disease, the iatrogenic impact of psychosis and its treatment, or patterns of individual coping that affect metacognition. With respect to the latter, McGlashan et al. (1975) used narrative interviews to delineate two "clinically distinct styles of recovery". An "*Integrating*" recovery style reflected a coherent narrative of the onset, experience and recovery from psychosis, acknowledging distress whilst exploring opportunities for the expression of resilience, incorporating the experience of psychosis into a broader behavioural and relational context. A "*Sealing Over*" recovery style delineates a pattern of coping whereby individuals isolate psychotic experiences from the broader context, whilst maintaining an awareness of the negative consequences of the disorder (McGlashan et al., 1975). Sealing over is associated with poorer outcome over 15-year follow-up (McGlashan, 1987). Tait et al. (2004) also reported that higher sealing over was associated with greater recall of negative early experiences and an insecure attachment style. The Adult Attachment Interview revealed that avoidant attachment was associated with significantly lower levels of mentalization as measured using the Reflective Functioning Scale (Macbeth et al., 2011). Therefore, an important line of enquiry is to consider whether the metacognitive impairments observed in people diagnosed with schizophrenia are linked to illness chronicity, premorbid social functioning, affect regulatory processes or the social mentality within which metacognition unfolds.

5. Alexithymia

Alexithymia is important to consider in the context of metacognition because it relates to the self-aspect of metacognition. Alexithymia has been defined as a combination of difficulties associated with (a) identifying feelings, (b) describing feelings to others, (c) constricted imagination and (d) an externally orientated thinking style. Both Taylor et al. (1997) and Vanheule et al. (2007) understand alexithymia within a broader affect-regulation framework. Alexithymia has been linked to fear of compassion and fear of happiness (Gilbert et al., 2010), poor engagement in psychotherapy (Ogrodniczuk et al., 2005), heightened somatic complaints in depression (Vanheule et al., 2007), and somatoform disorders (Pedrosa Gil et al., 2008).

Ogrodniczuk et al. (2011-this issue) explore the impact of alexithymia on the process and outcome of psychotherapy. They reported individuals with alexithymia are just as likely to seek psychological therapy as alternatives including medication or no treatment. Within psychological therapy, difficulties in identifying one's own feelings and communicating feelings to others were associated with less improvement in therapy and with more residual symptoms at the end of therapy. These poorer outcomes appear to, in part, relate to the therapists own negative response to difficulties communicating feelings and externally orientated thinking. An important pattern emerging in these data was greater difficulties in communicating feelings was linked to increased use of externally orientated thinking, and less expression of positive emotion. Lower levels of positive emotion were then linked to more negative reactions by the therapists .

In this section, Nicolò et al. (2011-this issue) explored alexithymia in a large sample ($n = 388$) of outpatients. They divided their sample into three groups based (High, Intermediate and Low Alexithymia) on scores on the Toronto Alexithymia Scale (TAS-20, Bagby et al., 1994). Those with some degree of alexithymia had significantly more interpersonal problems and significantly more Cluster C personality disorder traits. Interpersonal difficulties revolved around interpersonal ambivalence, need for social approval and lack of sociability. These interpersonal problems were particularly linked to difficulty describing feelings. The association with Cluster C personality traits is interesting given that these are the anxious, fearful personality disorders linked to Dependent, Avoidant and Obsessive-Compulsive personality. In a meta-analysis, Thorberg et al. (2011) found that a lack of perceived Maternal Care and nurturing, and perceptions of neglect, overprotection and intrusive parenting were associated with Difficulties Describing Feelings and Difficulties Identifying Feelings. Alexithymia has also been associated with self-reported insecure attachment style, particularly avoidant attachment (Besharat, 2010; Scheidt et al., 1999; Wearden et al., 2003). In addition, De Panfilis et al. (2008) found that the relationship between parental bonding and personality disorders was mediated by alexithymia.

The potential overlaps with attachment-based affect regulatory systems are of interest. Individuals with alexithymia tend to show avoidant attachment styles (De Rick and Vanheule, 2007). Using the Adult Attachment Interview (AAI), Scheidt et al. (1999) found that avoidant attachment was specifically related to externally orientated thinking. Externally orientated thinking style has been described as detached, reflecting either (a) a lack of interest or investment in relationships or (b) an avoidance of relationships (Vanheule et al., 2011-this issue). In this section, Vanheule et al. (2011-this issue) explored alexithymia in relation to a lexical analysis of transcribed narratives. Lexical analysis enables an implicit assessment of frequency and complexity of emotional themes. After depression was controlled for, the only predictor of alexithymic discourse was externally orientated thinking. Although the authors suggest replication of this finding, it is of particular interest given the potentially overlapping constructs of Externally orientated

thinking (reflected in this study as a pattern of social detachment), Attachment States of Mind (particularly dismissing avoidant states) and metacognition. Taken from this viewpoint, we might consider that avoidance/detachment (as observed in alexithymia and in psychosis populations) reflects the individual's attempts to cope with painful, intrusive and unwanted thoughts, feelings and interpersonal processes. One significant unintended consequence of avoidant/detached/dismissing coping is to limit capacity for growth of metacognitive functioning during crucial psychodevelopmental stages, thus increasing vulnerability to later psychopathology reflected in affect dysregulation (as observed in borderline personality disorder) or constricted cognitive-affective experience (as observed in alexithymia, overregulated personality disorders, or schizophrenia). In this sense, core to the development of psychopathology is the combination of vulnerable metacognitive functioning and affect regulation, the latter mediating the expression of symptomatology over time (Gumley et al., 2010).

6. Assessment of metacognition

One striking observation in reading this collection of studies is the range of assessments used to assess metacognition. This partially arises from differences in how metacognition is operationalised in relation to the measurement constructs adopted by the authors contributing to this special section. Some metacognitive assessments emphasise recognition and labeling of affect as in the Bell–Lysaker Emotional Recognition Task (BLERT; Bell et al., 1997; Bryson et al., 1997) and the Reading the Mind in the Eyes Test (Baron-Cohen et al., 2001) as described in Lysaker et al. (2011a,b,c-this issue). The Hinting Test (Corcoran et al., 2005) and the False Belief and Deception Story (Frith and Corcoran, 1996) as utilised in Lysaker et al. (2011a,b,c-this issue) emphasise understandings of mental states as inferred by stories and Stratta et al. (2011). The Sarfati Picture Arrangement Task (Sarfati et al., 2003), the Langdon Non-Verbal Theory of Mind Picture Sequencing Task (ToM-PST, Langdon and Coltheart, 1999), and the Brüne Mental State Attribution Task (MSAT, Brüne et al., 2007) as utilised in Achim et al. (2011-this issue) and Brüne et al. (2011-this issue) emphasise assessment of mental state understandings via the arrangement of pictures into a coherent story. In contrast, the Metacognition Assessment Scale (Semerari et al., 2003) used by Carcione et al. (2011-this issue) provides an assessment of metacognition as it is coded in naturally occurring discourse. We also observe the use of self-report questionnaires including the Interpersonal Reactivity Index (IRI; Davis, 1980 in Achim et al., 2011-this issue); the Beck Cognitive Insight Scale (BCIS; Beck et al., 2004 in Lysaker et al., 2011a,b,c-this issue) and the Toronto Alexithymia Scale (TAS-20; Bagby et al., 1994 in Nicolò et al., 2011-this issue and Vanheule et al., 2011-this issue). Finally, we also observe the use of innovative qualitative methods as described by Osatuke and Stiles (2011-this issue).

Now, as a reader, you would be forgiven for thinking that the preceding paragraph is a preamble towards a call for a European Union style, homogenization, single currency approach to metacognition. But this is not the case. Such diversity of assessment methods is to be applauded and underlines the rich multi-level understandings of metacognition and its expression in laboratory-based, narrative-based and self-, report-based approaches. In saying this however, it is an important priority to have an understanding of exchange rates between these diverse metacognitive currencies. For example, Lysaker and colleagues report associations between the laboratory-based tests including the Hinting Test, the BLERT and the Eyes Test, finding moderate associations (r_{range} 0.46 to 0.62). Similarly Brüne et al. (2011-this issue) report moderate associations between the TOM-PST and the MSAT (r_{range} 0.50 to 0.62). Stratta et al. (2011) report a modest correlation of $r = 0.39$ between first and second order ToM tests. In contrast correlations between these laboratory-based tests and self-reported BCIS self-reflectiveness are small to zero (r_{range} −0.10 to 0.16). Importantly, Bell et al. (2010) have called for a multi-method assessment of ToM in people diagnosed with schizophrenia.

Finally, the study by Vanheule et al. (2011-this issue) also raises the important question of self-report versus narrative based assessment methodology. This is especially important when attempting to assess functions that may well be outside a person's awareness. For example, an individual who has difficulty tuning into his or her own thoughts and those of others may experience limitations on being able to reflect on and self-report such difficulties. For example, self-report attachment methodology correlates poorly with narrative-based methodology (e.g. Riggs et al., 2007) where individuals with dismissing/avoidant states of mind self-report (at the semantic level) as securely attached. The dismissing defence does not permit elaborated reflection on attachment-based threats present in episodic memory.

7. Mechanisms of therapeutic change and recovery

Metacognitive approaches to psychotherapeutic change and outcome highlight the importance of interactions occurring within and between individuals, particularly with respect to expressions of positive and negative affect (Ogrodniczuk et al., 2011-this issue). In this special section, Osatuke and Stiles (2011-this issue) further explore mental states reflected in the qualitative data derived from psychotherapy transcripts of clients with depression. Utilising the Assimilation Model (Stiles, 1999), metacognition is conceptualised in terms of the level of integration between different self-states within people. The model is fluid and dynamic and incorporates the continuing elaboration of new self-states (experiential traces or voices). Voices that are incongruent with familiar self-states conflict with dominant voices. Depression is conceptualised as arising from the active suppression of self-affirming self-states. Osatuke and Stiles found that depressed clients experience complex conflict between internally dominant (assertive and controlling) and externally submissive (affiliative, caring and guilt-driven) voices with internally problematic but interpersonally assertive tones (confident, autonomous, directive, emphasising the client's own needs). It is striking from this study the interaction between simultaneously dominant and subordinate voices in conflict with each other in service of others' needs (internally dominant and externally submissive) and the client's own needs (internally problematic but interpersonally assertive). Conceptualising metacognition in terms of systems of internal and external representations provides an important understanding for therapists' attention to the therapeutic process, especially where expressions of warmth, empathy, compassion and understanding may be experienced as a source of threat further destabilizing conflictual representations.

Carcione et al. (2011-this issue) explored the mastery of mental states amongst 14 clients diagnosed with personality disorders during the early phase of psychotherapy (first 16 sessions). This is an important article given the importance of psychotherapy as a context to support development of mastery and coping. Utilising the Metacognitive Assessment Scale (Semerari et al., 2003; Carcione et al., 2010), Carcione and colleagues found that during the second half of therapy clients' use of mastery strategies was low; however, there was an indication that the proportion of successful applications of mastery strategies increased. In parallel a reduction in number and proportion of failures was also observed. This was particularly apparent in the use of second level Mastery strategies involving the conscious use of strategies to modify mental—state for example a reader of this commentary might feel an intense feeling of anger towards the author for having stolen valuable time from their lives. A successful second level strategy would involve watching a DVD as a means of calming down. These data are consistent with the observation that individuals with long standing interpersonal problems who are diagnosed with personality disorder are likely to require sustained treatment to develop, maintain and consolidate change.

Crucially, these articles show how the assessment of metacognition within therapy can provide important insights into mechanisms of change in psychological therapies. The careful incorporation of the individual's metacognitive capacity is a key aspect of any therapeutic

approach in terms of attuning to and facilitating appropriate levels of reflective awareness that match the individuals metacognitive abilities and capacities (Lysaker et al., 2011a,b,c-this issue; Fonagy et al., 2011). In addition, metacognition allows for an understanding of unbalanced communication of positive affect by therapists or how unintended activation of negative affect can overwhelm vulnerable metacognitive functioning and undermine intrapersonal and interpersonal affect-regulatory systems. Therefore, the formulation of metacognitive functioning and affect regulation is a key aspect of psychotherapeutic engagement and change.

8. Conclusions

These articles point towards a rich and varied research agenda that will require increasing collaboration and cross-cutting multidisciplinary perspectives on metacognition. We remain at the early stages of this research endeavour and there are remarkable opportunities to develop the field further. For example, there is a need for transdiagnostic research comparing metacognitive functioning amongst different diagnostic groups, or research exploring how coping styles or attachment states of mind might be associated with the materialization of metacognition and the expression of symptoms both cross-sectionally and over time. Clinically, we begin to see the emergence of a series of closely related transdiagnostic constructs including metacognition, alexithymia, coping and affect regulation that will provide an insight into the development and expression of psychopathology. We also can identify a key psychological mechanism of change that can provide insights into processes of recovery and relationships with outcomes.

References

Achim, A.M., Ouellett, R., Roy, M.A., Jackson, P.L., 2011. Assessment of empathy in first episode psychosis and meta-analytic comparison with previous studies in schizophrenia. Psychiatry Research 190 (1), 3–8 (this issue).

Bagby, M.R., Parker, J.D.A., Taylor, G.J., 1994. The twenty-item Toronto Alexithymia scale—I. Item selection and cross-validation of the factor structure. Journal of Psychosomatic Research 38, 23–32.

Baron Cohen, S., 2005. Autism. In: Hopkins, B., Barr, R.G., Michel, G.F., Rochat, P. (Eds.), Cambridge Encyclopaedia of Child Development, Vol. 28. Cambridge University Press, Cambridge, pp. 109–126.

Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., Plumb, I., 2001. The "Reading the Mind in the Eyes" Test revised version: a study with normal adults, and adults with Asperger syndrome or high-functioning autism. Journal of Child Psychology and Psychiatry 42, 241–251.

Beck, A.T., Baruch, E., Balter, J.M., Steer, R.A., Warman, D.M., 2004. A new instrument for measuring insight: The Beck Cognitive Insight Scale. Schizophrenia Research 68, 319–329.

Bell, M.D., Bryson, G.J., Lysaker, P.H., 1997. Positive and negative affect recognition in schizophrenia: A comparison with substance abuse and normal control subjects. Psychiatry Research 73, 73–82.

Bell, E.M., Langdon, R., Siegert, R., Ellis, P.M., 2010. The assessment of theory of mind in Schizophrenia. In: Dimaggio, G., Lysaker, P.H. (Eds.), Metacognition and Severe Adult Mental Disorders: From research to treatment. Routeledge, Hve, East Sussex.

Besharat, M.A., 2010. Attachment styles and alexithymia. Psychological Research 12, 63–80.

Brüne, M., Brüne-Cohrs, U., 2006. Theory of Mind – evolution, ontogeny, brain mechanisms and psychopathology. Neuroscience and Biobehavioural Reviews 30, 437–455.

Brüne, M., Abdel-Hamid, M., Lehmkamper, C., Sonntag, C., 2007. Mental state attribution, neurocognitive functioning, and psychopathology: What predicts poor social competence in schizophrenia best? Schizophrenia Research 92, 151–159.

Brüne, M., Schaub, D., Juckel, G., Langdon, R., 2011. Social skills and behavioral problems in schizophrenia: the role of mental state attribution, neurocognition and clinical symptomatology. Psychiatry Research 190 (1), 9–17 (this issue).

Brunet-Gouet, E., Achim, A.M., Vistoli, D., Passerieux, C., Hardy-Baylé, M-C., Jackson, P.L., 2011. The study of social cognition with neuroimaging methods as a means to explore future directions of deficit evaluation in schizophrenia. Psychiatry Research 190 (1), 23–31 (this issue).

Bryson, G.J., Bell, M.D., Lysaker, P.H., Greig, T., Kaplan, E., 1997. Affect recognition in schizophrenia: A function of global impairment or a specific cognitive deficit? Psychiatry Research 71, 105–113.

Carcione, A., Nicolò, G., Pedone, R., Popolo, R., Conti, L., Fiore, D., Procacci, M., Semerari, A., Dimaggio, G., 2011. Metacognitive mastery dysfunctions in personality disorder psychotherapy. Psychiatry Research 190 (1), 60–71 (this issue).

Carcione, A, Dimaggio, G, Conti, L, Nicolò, G., Fiore, D., Procacci, M., Semerari, A., 2010. Metacognition Assessment Scale (MAS) V. 4.0-Manual. Unpublished manuscript, Rome.

Corcoran, R., Mercer, G., Frith, C., 2005. Schizophrenia, symptomatology and social inference: Investigating theory of mind in people with schizophrenia. Schizophrenia Research 24, 397–405.

Davis, M., 1980. A multidimensional approach to individual differences in empathy. JSAS Catalog of Selected Documents in Psychologie 10, 85.

Decety, J., Jackson, P., Brunet, E., 2007. The cognitive neuropsychology of empathy. In: Farrow, T., Woodruff, P. (Eds.), Empathy in Mental Illness and Health. Cambridge University Press, New York.

De Panfilis, C., Salvatore, P., Marchesi, C., Cazzola, R., Tonna, M., Maggini, C., 2008. Parental bonding and personality disorder: the mediating role of alexithymia. Journal of Personality Disorders 22, 496–508.

De Rick, A., Vanheule, S., 2007. Attachment styles in alcoholic patients. European Addiction Research 13, 101–108.

Fonagy, P., Bateman, A., Bateman, A., 2011. The widening scope of mentalizing: a discussion. Psychology and Psychotherapy: Theory, Research and Practice 84, 98–110.

Fonagy, P., Target, M., 2006. The mentalization-focussed approach to self pathology. Journal of Personality Disorders 20, 544–576.

Fonagy, P., Gergely, G., Target, M., 2007. The parent–infant dyad and the construction of the subjective self. Journal of Child Psychology and Psychiatry 48, 288–328.

Frith, C.D., Corcoran, R., 1996. Exploring 'theory of mind' in people with schizophrenia. Psychological Medicine 26 (3), 521–530.

Gilbert, P., McEwan, K., Matos, M., Rivis, M., 2010. Fears of compassion: development of three self-report measures. Psychology and Psychotherapy: Theory, Research and Practice. doi:10.1348/147608310X526511 electronic publication 3 November.

Gumley, A.I., 2010. The developmental roots of compromised mentalization in complex mental health disturbances of adulthood: an attachment based conceptualisation. In: Dimaggio, G., Lysaker, P.H. (Eds.), Metacognition and severe adult mental disorders: From basic research to treatment. Routledge, London.

Gumley, A.I., Braehler, C., Laithwaite, H., Macbeth, A., Gilbert, P., 2010. A compassion focused model of recovery after psychosis. International Journal of Cognitive Psychotherapy 3, 186–201.

Hoy, K.E., Barrett, S.L., Shannon, C., Campbell, C., Watson, D.R., Rushe, T., Shevlin, M., Bai, F., Cooper, S.J., Mulholland, C.C., 2011. Childhood trauma and hippocampal and amygdalar volumes in first episode psychosis. Schizophrenia Bulletin. doi:10.1093/schbul/sbr085 electronic publication 28 July.

Hrdy, S.B., 2009. Mothers and Others: The Evolutionary Origins of Mutual Understanding. Harvard University Press, Cambridge, MA.

Jackson, P.L., Meltzoff, A.N., Decety, J., 2005. How do we perceive the pain of others? A window into the neural processes involved in empathy. NeuroImage 24, 771–779.

Liotti, G., Gilbert, P., 2011. Mentalizing, motivation and social mentalities: theoretical considerations and implications for psychotherapy. Psychology and Psychotherapy 84, 9–25.

Lysaker, P.H., Carcione, A., Dimaggio, G., Johannesen, J.K., Nicolò, G., Procacci, M., Semerari, A., 2005. Metacognition amidst narratives of self and illness in schizophrenia: associations with insight, neurocognition, symptom and function. Acta Psychiatrica Scandinavica 112, 64–71.

Lysaker, P.H., Dimaggio, G., Buck, K.D., Carcione, A., Nicolò, G., 2007. Metacognition within narratives of schizophrenia: associations with multiple domains of neurocognition. Schizophrenia Research 93, 278–287.

Lysaker, P.H., Warman, D.M., Dimaggio, G., Procacci, M., LaRocco, V.A., Clark, L.K., Dike, C.A., Nicolò, G., 2008. Metacognition in Schizophrenia: Associations with multiple assessments of executive function. Journal of Nervous and Mental Disease 196, 384–389.

Lysaker, P.H., Dimaggio, G., Carcione, A., Procacci, M., Buck, K.D., Davis, L.W., Nicolò, G., 2010. Metacognition and schizophrenia: the capacity for self-reflectivity as a predictor for prospective assessments of work performance over six months. Schizophrenia Research 122, 124–130.

Lysaker, P.H., Gumley, A.I., Dimaggio, G., 2011a. Metacognitive disturbances in persons with severe mental illness: theory, correlates with psychopathology and models of psychotherapy. Psychology and Psychotherapy: Theory, Research and Practice 84, 1–8.

Lysaker, P.H., Gumley, A., Brune, M., Vanheule, S., Buck, K., Dimaggio, G., 2011b. Deficits in the ability to recognize one's own affects and those of others: associations with neurocognition, symptoms and sexual trauma among persons with schizophrenia spectrum disorders. Consciousness and Cognition 20 (4), 1183–1192.

Lysaker, P.H., Olesek, K.L., Warman, D.M., Martin, J.M., Salzman, A.K., Nicolò, G., Salvatore, G., Dimaggio, G., 2011c. Metacognition in schizophrenia: correlates and stability of deficits in theory of mind and self-reflectivity. Psychiatry Research 190 (1), 18–22 (this issue).

MacBeth, A., Gumley, A.I., Fisher, R., Schwannauer, M., 2011. Attachment states of mind, mentalisation and their correlates in first episode psychosis. Psychology and Psychotherapy: Theory, Research and Practice 84, 42–57.

McGlashan, T.H., 1987. Recovery style from mental illness and long-term outcome. The Journal of Nervous and Mental Disease 175, 681–688.

McGlashan, T.H., Levy, S.T., Carpenter, W.T., 1975. Integration and sealing over: clinically distinct recovery styles from schizophrenia. Archives of General Psychiatry 32, 1269–1272.

Nicolò, G., Semerari, A., Lysaker, P., Dimaggio, G., Conti, L., D'Angerio, S., Procacci, M., Popolo, R., Carcione, A., 2011. Alexithymia in personality disorders: Correlations with symptoms and interpersonal functioning. Psychiatry Research 190 (1), 37–42 (this issue).

Ogrodniczuk, J.S., Piper, W.E., Joyce, A.S., 2005. The negative effect of alexithymia on the outcome of group therapy for complicated grief: what role might the therapist play? Comprehensive Psychiatry 46, 206–213.

Ogrodniczuk, J., Piper, W.E., Joyce, A.S., 2011. Effect of alexithymia on the process and outcome of psychotherapy: a programmatic review. Psychiatry Research 190 (1), 43–48.

Osatuke, K., Stiles, W.B., 2011. Metacognition, depression, assimilation model, traces of experience, problematic voices. Psychiatry Research 190 (1), 52–59 (this issue).

Pedrosa Gil, F., Scheidt, C.E., Hoeger, D., Nickel, M., 2008. Relationship between attachment style, parental bonding and alexithymia in adults with somatoform disorders. International Journal of Psychiatry in Medicine 38, 437–451.

Raposo, A., Vicens, L., Clithero, J.A., Dobbins, I.G., Huettel, S.A., 2010. Contributions of frontopolar cortex to judgements about self, others and relations. Social Cognitive and Affective Neuroscience 3, 260–269.

Riggs, S.A., Paulson, A., Tunnell, E., Sahl, G., Atkison, H., Ross, C.A., 2007. Romantic attachment style versus Adult Attachment Interview states of Mind. Development and Psychopathology 19, 263–291.

Sarfati, Y., Brunet, E., Hardy-Bayle, M.C., 2003. Comic-Strip Task: Attribution of intentions to others. Service de Psychiatry Adulte, Hôpital de Versailles, Le Chesnay, France.

Saxe, R., Moran, J.M., Scholz, J., Gabrieli, J., 2006. Overlapping and non-overlapping brain regions for theory of mind and self reflection in individual subjects. Social Cognitive and Affective Neuroscience 1, 229–234.

Saxe, R., Wexler, A., 2005. Making sense of another mind: the role of the right temporo-parietal junction. Neuropsychologia 43, 1391–1399.

Scheidt, C.E., Waller, E., Schnock, C., Becker-Stoll, F., Zimmerman, P., Lucking, C.H., Wirsching, M., 1999. Alexithymia and attachment representation in idiopathic spasmodic torticollis. The Journal of Nervous and Mental Disease 187, 47–52.

Semerari, A., Carcione, A., Dimaggio, G., Falcone, M., Nicolò, G., Procaci, M., Alleva, G., 2003. How to evaluate metacognitive function in psychotherapy? The Metacognition assessment scale its applications. Clinical Psychology & Psychotherapy 10, 238–261.

Shannon, C., Douse, K., McCusker, C., Feeney, L., Barrett, S., Mulholland, C., 2011. The association between childhood trauma and memory functioning in schizophrenia. Schizophrenia Bulletin 37 (3), 531–537.

Sprong, M., Scothorst, P., Vos, E., Hox, J., van Engeland, H., 2007. Theory of mind in schizophrenia. British Journal of Psychology 191, 5–13.

Stratta, P., Bustini, M., Daneluzzo, E., Riccardi, I., D'Arcangelo, M., Rossi, A., 2011. Deconstructing theory of mind in schizophrenia. Psychiatry Research 190 (1), 32–36 (this issue).

Tait, L., Birchwood, M., Trower, P., 2004. Adapting to the challenge of psychosis: personal resilience and the use of sealing-over (avoidant) coping strategies. The British Journal of Psychiatry 185, 410–415.

Taylor, G.J., Bagby, R.M., Parker, J.D.A., 1997. Disorders of Affect Regulation. Cambridge University Press, Cambridge.

Thorberg, F.A., Young, R. McD, Sullivan, K.A., Lyvers, M., 2011. Parental bonding and alexithymia: a meta-analysis. European Psychiatry 26, 187–193.

Vanheule, S., Desmet, M., Meganck, R., Bogaerts, S., 2007. Alexithymia and interpersonal problems. Journal of Clinical Psychology 63, 109–117.

Vanheule, S., Meganck, R., Desmet, M., 2011. Alexithymia, social detachment and cognitive processing. Psychiatry Research 190 (1), 49–51 (this issue).

Wearden, A., Cook, L., Vaughn-Jones, J., 2003. Adult attachment, alexithymia, symptom reporting, and health related coping. Journal of Psychosomatic Research 55, 341–347.