

Phenomenological predictors of psychosocial function in bipolar disorder: Is there evidence that social cognitive and emotion regulation abnormalities contribute?

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Abstract

Objectives: Neurocognitive ability and mood have often been discussed as contributing mechanisms to the severe psychosocial dysfunction experienced in bipolar disorder (BD). In contrast, there has been little discussion on the contribution of social cognition or emotion regulation. This paper aims to assert a potential role for these constructs in psychosocial functioning in BD, with an overarching goal to highlight the necessary importance of considering them in future research examining psychosocial outcomes in the disorder.

Methods: This paper provides a theoretical synthesis of available and indirect evidence for an influence of (1) social cognition and (2) emotion regulation on psychosocial functioning; it acknowledges important clinical questions that need addressing, and discusses how current research might be translated to improve the treatment of psychosocial dysfunction in BD.

Results: Given their assumed roles in facilitating social interactions and modulating behaviours, it is certainly plausible that abnormalities in social cognition and emotion regulation are detrimental to psychosocial functioning. Currently, there is only minimal direct evidence examining their influence, although existing BD studies are preliminarily supportive of relationships between these constructs.

Conclusions: There are reasonable theoretical grounds, supported by indirect and preliminary evidence, to suggest that social cognition and emotion regulation may be important in the prediction of psychosocial outcome in BD. However, this proposition is limited by the paucity of empirical research directly examining this matter.

Keywords

Emotion regulation, functional outcome, neurocognition, quality of life, social cognition

Introduction

Bipolar disorder (BD) is a severe mood disorder characterised by problems in psychological, social and interpersonal functioning (Coryell et al., 1998; Godard et al., 2012; Judd et al., 2005; Keenan-Miller and Miklowitz, 2011; MacQueen et al., 2001; Rosa et al., 2009; Sánchez-Moreno et al., 2009; Serretti et al., 1999). For patients diagnosed with BD the capacity for effective employment, meaningful and long-term interpersonal relationships and good psychological adjustment is significantly reduced (Australian Bureau of Statistics, 2007). Such impairment can have detrimental effects, with a lifetime risk for suicide in people with BD estimated to be as high as 15% (Black Dog

Institute, 2012). Indeed, BD disrupts life to the same degree as chronic medical illnesses such as multiple sclerosis and

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rheumatoid arthritis, with psychological well-being, family and social relationships, and employment being the life domains most affected (Robb et al., 1997).

Many people with BD have difficulty in carrying out work functions (Judd et al., 2008) and in some cases are unable to work (Dion et al., 1988). They report difficulties in social activities (Morriss et al., 2007) and social skills performance (Goldstein et al., 2006), as well as maladjustment in marital or romantic relationships (Blairy et al., 2004; Tsai et al., 1999). People with BD also consistently demonstrate lower scores on subjective psychosocial functioning (i.e. quality of life) scales (Cramer et al., 2010; Freeman et al., 2009; Gutiérrez-Rojas et al., 2008; Saarni et al., 2010; Srivastava et al., 2010) and have reduced or labile self-esteem (Blairy et al., 2004; Knowles et al., 2007; Serretti et al., 1999).

Traditionally, clinical symptomatology has been implicated as a primary predictor of psychosocial outcome in BD; residual depressive symptoms occurring independently of mood episodes are often found in BD patients (Goossens et al., 2008; Keitner et al., 1996) and this depressive symptomatology appears to exacerbate psychosocial difficulties. However, even when it is attenuated, psychosocial impairment remains (Bauer et al., 2001; Bonnín et al., 2010; Godard et al., 2012; Simon et al., 2008; Tabarés-Seisdedos et al., 2008; Wingo et al., 2009).

At a phenomenological level, BD is characterised by a compromised neurocognitive profile (Arts et al., 2008; Balanzá-Martínez et al., 2005). Meta-analytic studies indicate large effect size deficits for patients with BD, even during remission (Bora et al., 2009a). It is now becoming increasingly clear that patients' ability to develop new skills, respond flexibly to a changing environment and create complex understandings of life are constrained. Consequently, neurocognitive ability has been associated with objective, and to a lesser degree, subjective psychosocial functioning in the disorder in multiple studies, including consistently those examining euthymic samples (Altshuler et al., 2008; Atre-Vaidya et al., 1998; Bonnín et al., 2010; Bowie et al., 2010; Brissos et al., 2008a, 2008b; Burdick et al., 2010; Dickerson et al., 2004, 2010; Dittmann et al., 2007; Fujii et al., 2004; Jabben et al., 2010; Jaeger et al., 2007; Laes and Sponheim, 2006; Lahera et al., 2009; Malhi et al., 2007; Martínez-Arán et al., 2002, 2004, 2007; Martino et al., 2009, 2011a; Mur et al., 2009; Sánchez-Morla et al., 2009; Simonsen et al., 2010; Solé et al., 2012; Tabarés-Seisdedos et al., 2008; Torres et al., 2011; Wingo et al., 2010; Yen et al., 2009). Given evidence that neurocognitive deficits perpetuate psychosocial dysfunction independently of affective symptomatology, neurocognition is considered to have a significant, yet clinically separate role in the prediction of functional outcome in BD (Bowie et al., 2010; Burdick et al., 2010; Jaeger et al., 2007; O'Shea et al., 2010; Tabarés-Seisdedos et al., 2008; Torres et al., 2011).

Nevertheless, as the variance that neurocognition explains in psychosocial outcomes differs across studies (Martínez-Arán et al., 2007; Martino et al., 2009), and as BD is a complex disorder likely to have several biological, psychological and environmental aetiologies, it is likely that other core features in its phenomenological profile also contribute to its psychosocial dysfunction. For example, documented BD patient difficulties in regulating emotion and in social-cognitive processes, including emotion perception and theory of mind, may be involved (Bora et al., 2005; Getz et al., 2003; Meyer et al., 2001; Rossell and Van Rheenen, 2013; Van Rheenen and Rossell, 2013b).

Although conceptually distinct, with neurocognition describing a range of mental functions innately linked to the brain, social cognition describing a branch of processing involved in perceiving, interpreting and responding to the social world, and emotion regulation describing a range of processes involved in the reactivity to, and evaluation and modulation of emotion, there is likely to be inherent overlap in these constructs (Frith and Frith, 2007; Gratz and Roemer, 2004; Gross, 2011; Larner, 2008). Indeed, converging evidence suggests that neurocognition is influential to social cognition and emotion regulation, with the potential for good neurocognition to be a necessary precursor to good social cognitive and emotion regulatory function (Fanning et al., 2012; Van Rheenen and Rossell, 2013a). It is theoretically possible then, that these processes contribute to psychosocial outcome in the disorder as well, particularly given their likely role in facilitating adaptive social interactions that are core to adaptive occupational and social behaviours.

Currently, there is only minimal research in the BD literature explicitly investigating whether social cognition and emotion regulation are related to psychosocial function (Inoue et al., 2004; Simonsen et al., 2010; Torres et al., 2011; Wingo et al., 2009, 2010). As social cognition and emotion regulation have the potential to represent more proximal and complex predictors of psychosocial outcome than neurocognition itself, a better understanding of how significant these constructs may be for predicting psychosocial outcome is important for enhancing the assessment and treatment for the disorder.

This paper draws on both direct and indirect available evidence to assert a potential role for social cognition and emotion regulation in psychosocial functioning in BD. Its overarching goal is to highlight the necessary importance of considering these factors in future research examining psychosocial outcomes in the disorder. To this end, the paper provides a theoretical synthesis of available evidence for an influence of (1) social cognition and (2) emotion regulation on psychosocial functioning, gives rise to important clinical questions that need addressing, and discusses what such research could offer to the treatment of psychosocial dysfunction in BD.

Social cognition as a potential predictor of psychosocial dysfunction in BD

The ability to recognise and theorise about other people's emotions are important factors in social and emotional competence, and are fundamental to interpersonal relationships (Wallace, 1984). Misunderstanding facial and prosodic emotional expressions reduces the accuracy of inferences made about the emotional state of a communicator, and limits the capacity to make social hypotheses, which can lead to a range of maladaptive psychosocial consequences (Batty and Taylor, 2003). Accurate emotion perception enables empathy and pro-social behaviours, whilst misperception of emotion reduces social communication, degrades appropriate emotional responses and increases the tendency to socially withdraw (Hooker and Park, 2002; Izard et al., 2001; Schultz et al., 2001).

Accurate emotional perception has been associated with social and intercultural adjustment in healthy individuals (Leppänen and Hietanen, 2001; Yoo et al., 2006). In disorders characterised by poor emotion perception and theory of mind ability, there is also growing evidence to demonstrate that emotion perception is related to psychosocial functioning (Couture et al., 2006; Lee et al., 2005; Mueser et al., 1996; Persad and Polivy, 1993). For example, in schizophrenia populations, a greater ability to recognise emotions is related to better independent living and occupational skills (Kee et al., 2003), better social problem solving (Vaskinn et al., 2008), greater overall satisfaction (Sparks et al., 2010) and better social skills (Irani et al., 2012).

Schizophrenia is theoretically and phenomenologically similar to BD, and its associated deficits may also be well represented in BD samples (Bora et al., 2009b; Tabarés-Seisdedos et al., 2008). As in schizophrenia, patients with BD tend to have difficulty in accurately identifying or distinguishing emotional expressions and conceptualising other people's emotional and mental states (Addington and Addington, 1998; Bozikas et al., 2006, 2007; Getz et al., 2003; Hofer et al., 2010; Lembke and Ketter, 2002; Murphy and Cutting, 1990). These difficulties are likely to detrimentally influence the formation of social networks and social relationships (Inoue et al., 2004; Schenkel et al., 2008) that are often significantly impaired in the disorder (Bauwens et al., 1991; Blairy et al., 2004; Calabrese et al., 2003; Elgie and Morselli, 2007; Sánchez-Moreno et al., 2009; see Huxley and Baldessarini, 2007 for a review).

Indeed, there is some evidence to demonstrate that emotion perception deficits are involved in psychosocial functioning in BD. For example, in two separate studies examining samples of euthymic BD patients, facial emotion processing accuracy was found to be related to objective psychosocial functioning (Martino et al., 2011b), lower ratings of depression and greater subjective quality of life

(Hoertnagl et al., 2011). There were also reports of a trend-level relationship between emotion perception accuracy and higher rates of employment and general functioning in the latter investigation.

Our social cognitive ability to make inferences about the mental and emotional state of others, typically referred to as theory of mind, has also been strongly related to psychosocial outcome (Couture et al., 2006). Poor theory of mind ability has been associated with poor interpersonal skills (Pinkham and Penn, 2006), severe social behavioural problems (Brüne, 2005), worse overall community social functioning (Pollice et al., 2002) and poor pre-morbid functioning in schizophrenia (Schenkel et al., 2005). In BD too, theory of mind impairments have been preliminarily linked with poor functional outcome in two euthymic BD samples (Hajnal et al., 2010; Lahera et al., 2009). Such associations presumably occur as a result of the maladaptive emotional responses evoked on misinterpretation or misunderstanding of emotional information. Indeed, poorer ability to manage emotions is associated with poorer positive relationships and greater negative interactions with others (Lopes et al., 2003).

Emotion regulation as a potential predictor of psychosocial function in BD

The term 'emotion regulation' is a broad term describing both temperamental reactivity to emotional stimuli and abilities that involve inhibition, initiation and modulation of behaviours, acceptance, awareness, understanding and control of emotions, and the appropriate use of regulation strategies (Gratz and Roemer, 2004; Gross, 2011). Dysregulated emotional responses and trait emotional reactivity are common in BD (Johnson et al., 2009; Meyer et al., 2001); relationships between emotion regulation and psychosocial outcome have been demonstrated preliminarily in both the disorder itself and in other clinical samples that are phenotypically related. For example, Persad and Polivy (1993) found that depressed patients reacted with avoidance and heightened negative affect to emotional cues from others. A recent study by Matthews and Barch (2010) demonstrated a positive association between emotional reactivity to affective stimuli and functional outcome in schizophrenia. Similarly, Goldstein et al. (2006) reported that social skills performance in a group of euthymic adolescent BD patients was reduced in the absence of any observable deficit in social skills knowledge. The authors argued that emotional dysregulation interferes with the utilisation of appropriate social skills.

Indeed, the management of emotions has been found to be an important predictor of the ability to initiate relationships, manage conflict and provide emotional support for others (Yip and Martin, 2006). Those with a greater ability to emotionally manage are also less likely to have negative

interactions with others and report greater psychological well-being (Lopes et al., 2003), whereas those with poorer emotion regulation have diminished self-esteem, reduced life satisfaction and depressive symptoms (Gross, 2003). Certainly, patients with BD often experience emotionally intense interpersonal situations characterised by anger or frustration, whereby emotional control is particularly dysregulated (Keenan-Miller and Miklowitz, 2011). Such explosive situations place strain on interpersonal relationships and can lead to the experience of depressive symptoms (Rowe and Morris, 2012) which impact subjective quality of life (Dias et al., 2008). Accordingly, early research indicates that euthymic BD patients' experiences of emotion are more intense than that of controls and correlate with subjective psychosocial function (Hoertnagl et al., 2011). Adolescent BD patients reporting a diminished ability to regulate emotion in anger-provoking situations have also been found to report lower self-esteem, greater feelings of hopelessness and poorer coping strategies than controls (Rucklidge, 2006).

Given the broad nature of the emotion regulation concept, one of several ways that poor emotion regulation may exert its potential influence on psychosocial functioning in BD is by influencing depressive symptoms that are strongly predictive of psychosocial impairment (for a review, see Sánchez-Moreno et al., 2009). Indeed, problematic emotion modulation strategies including rumination for both positive and negative emotion have been associated with depressive symptoms, including reduced or labile self-esteem in people with subclinical hypomania and full-blown BD (Bentall et al., 2011; Gruber et al., 2011). Depression occurring on the basis of disturbed self-esteem in the disorder has been reported to arise from patients' negative perceptions of other people's evaluations of themselves (Johnson et al., 2000). It is certainly plausible that characteristically dysregulated and variable emotional behaviour is at the basis of these negative self-evaluations.

Fluctuations in self-esteem have been specifically associated with the disorder's trait tendency to be reactive to salient emotional stimuli, such that even minor experiences of perceived threat or reward affect levels of self-esteem and confer vulnerability for the development of depressive or manic symptoms (Johnson et al., 2000; Klein, 1992; Shapira et al., 1999; Urošević et al., 2008). For example, heightened emotional reactivity is often accompanied by large changes in self-esteem in people with BD (Pavlova et al., 2011). These changes are reflective of ascent/descent behaviours that pre-empt the development of affective episodes; inflated self-esteem is a defining feature of mania and is prodromal to its onset. Likewise, low levels of self-esteem are prodromal to depression (Lam and Wong, 1997; Mansell and Pedley, 2008). Maladaptive emotional regulation strategies such as rumination and heightened threat reactivity (also called behavioural inhibition) have been found to load on the same factor as low self-esteem, suggesting that they are

highly related and can be considered to form a negative cognitive syndrome that predicts BD symptoms (Van der Gucht et al., 2009). Further evidence of this connection comes from Scott and Pope (2003), who found that hypomanic patients with negative self-esteem were significantly more likely to experience an affective relapse. Unfortunately, an increased history of mood episodes is predictive of worse psychosocial functioning (MacQueen et al., 2000; Sierra et al., 2005).

Trait emotional reactivity to threat or reward has been equated with neurotic temperament, which is increased in the disorder (Gray, 1981, 1987; Mitchell et al., 2007). That is, patients with BD tend to view the world as a threatening place and are highly self-conscious, insecure, low in self-esteem and tend toward worry and negative affect (Jylhä et al., 2010; Mitchell et al., 2004). Patients with BD also demonstrate heightened levels of impulsivity, a lower-order feature of neuroticism. This impulsivity is argued to arise when threat or reward inputs are made and arousal levels increase the speed of subsequently occurring responses (Wallace et al., 1991). There is a substantial literature that documents a relationship between facets of neuroticism and psychosocial function (Pope et al., 2007). For example, in BD, neuroticism has been linked to a lower subjective quality of life, increased symptom severity and frequency, and lower self-confidence (Carpenter et al., 1999; Heerlein et al., 1998; Jones et al., 2009; Lozano and Johnson, 2001; Quilty et al., 2009). Family-related neuroticism has also been associated with poor psychosocial outcome in children of mood-disordered parents (Ellenbogen and Hodgins, 2004) and impulsivity has been related to suicide attempts, increased aggression and poorer subjective quality of life in mood-disordered patients themselves (Ekinici et al., 2011; Perroud et al., 2011).

Neuroticism has also been found to predispose people to the experience of life events relevant to the onset or increase of BD symptoms. Heightened emotional reactivity to reward or threat-based environmental cues is likely to prompt these events (Magnus et al., 1993; Urošević et al., 2010). Indeed, research shows that neurotic people orient attention more readily and are attuned to or have difficulty shifting attention away from negative stimuli (Derryberry and Reed, 1994; Reed and Derryberry, 1995; Wallace and Newman, 1998). In fact, emotional reactivity is posited to be a fundamental variable in triggering BD symptoms by predisposing one to the experience of life events that are subsequently poorly controlled (Johnson, 2005). For example, mania is associated with unrealistically high confidence following an initial success (Johnson et al., 2005).

Discussion

Patients with BD are severely psychosocially impaired, an outcome that has been historically attributed to clinical symptomatology and, more recently, neurocognitive

capacity (Bonnín et al., 2010; Brissos et al., 2008b; Zaretsky, 2003). Importantly, the growing body of research indicating a contribution of neurocognition to psychosocial outcome is evident consistently in euthymic samples, and often occurs independently of the influence of subclinical depression. This supports a growing consensus amongst researchers that clinical status and psychosocial status are separable constructs (Bowie et al., 2010; Tabarés-Seisdedos et al., 2008; Torres et al., 2011). Nevertheless, the variance explained by neurocognition varies across studies (Brissos et al., 2008b; Martínez-Arán et al., 2007; Martino et al., 2009) and it is likely that other key trait features of the disorder's phenomenological profile are also partially accountable.

In particular, it is plausible that the capacity for adaptive social cognition and emotion regulation contribute to psychosocial functioning in BD, given the roles of these processes in facilitating social interactions and modulating behaviours that are core to a healthy psychosocial outcome. Indeed, there is reasonable theoretical rationale for the proposition that social cognitive impairments, like neurocognitive impairments, directly influence adaptive psychosocial function in BD. Results from initial studies partly addressing social cognitive contributions in the disorder also suggest that its influence may occur in a manner that is independent from mood (Hajnal et al., 2010; Hoertnagl et al., 2011; Lahera et al., 2009; Martino et al., 2011b). Conversely, it is likely that abnormalities in emotion regulation perpetuate psychosocial dysfunction in BD by catalysing or exacerbating clinical symptoms.

Although there is only minimal direct evidence examining the influence of these functions on outcome, the existing BD studies are preliminarily supportive of relationships between these constructs (Hajnal et al., 2010; Lahera et al., 2009; Martino et al., 2011b). That there is reasonable theoretical justification for their association, formulated on the basis of indirect support for an association between these variables from studies of related disorders and healthy populations (Kee et al., 2003; Mathews and Barch, 2010; Sparks et al., 2010), suggests that the influence of social cognition and emotion regulation on psychosocial function in BD are areas worthy of future research.

Certainly, converging evidence suggesting that neurocognition is influential to social cognitive performance and emotion regulation is indirectly supportive of this proposition (Fanning et al., 2012; Van Rheenen and Rossell, 2013a). However, as there is little clarity with regards to how important the relative contributions of neurocognition, social cognition and emotion regulation are, or the mechanisms by which psychosocial difficulties in BD are maintained, a number of questions remain unanswered.

This is notable given that in overlapping clinical conditions such as schizophrenia, there are growing reports that the effects of neurocognition on psychosocial functioning are mediated by social cognitive processes; social cognition appears to be more proximal to psychosocial outcome and,

thus, a potentially better treatment target for the remediation of psychosocial difficulties (Addington et al., 2006; Bora et al., 2006; Brekke et al., 2005; Couture et al., 2006; Green and Nuechterlein, 1999; Green et al., 2000; Harvey et al., 2010; Pinkham and Penn, 2006; Vaskinn et al., 2008; Vauth et al., 2004). Such findings are undoubtedly relevant to the study of psychosocial functioning in BD, and it is certainly possible, albeit speculative, that neurocognition affects psychosocial function indirectly via social cognition in BD as well.

Indeed, the relative influence and importance of these constructs on psychosocial outcome, and the potential mechanisms of mediation they may form for the maintenance of psychosocial difficulties in BD represent important clinical questions. Future studies of psychosocial outcome would therefore do well to investigate social cognition and emotion regulation more comprehensively and concurrently with neurocognition and subclinical symptomatology. Importantly, these studies would need experimental designs that consider the multiple interrelated variables appropriately, and thus employ robust statistical techniques including sophisticated forms of regression, path analysis or structural equation modelling to establish relationships and mechanisms of prediction. Given that it is also unclear as to whether objective psychosocial function parallels subjective psychosocial function (Goldberg and Harrow, 2005; MacQueen et al., 2000), future studies should also endeavour to investigate whether these constructs influence measures of patient-rated or administrator-rated psychosocial outcomes differently.

Certainly, these kinds of investigations would inform the development of psychological treatments that may be effective in improving psychosocial outcome in the disorder. Current psychological treatments for BD include cognitive behavioural therapy (CBT) and interpersonal social rhythm therapy (ISRT); these techniques show small effects on the reduction of symptoms and improvement in psychosocial functioning (Costa et al., 2011; Gregory, 2010; Hlastala et al., 2010; Hollon and Ponniah, 2010). However, these treatments provide intervention after neurocognitive, social cognitive or emotion regulation abnormalities are established. Treatments that target abnormalities such as those associated with neurocognition and those that aim to improve emotional processing, theory of mind and emotional regulation, prior to CBT and ISRT would provide a more solid foundation to build upon, which may in turn result in better psychosocial function for BD patients.

There is growing support for the development of novel treatment approaches to reduce psychosocial dysfunction in BD (Harvey et al., 2010; Martínez-Arán et al., 2011; Mennin and Fresco, 2009; Tufrey and Coulston, 2010). In schizophrenia and schizoaffective disorder, programs that remediate cognitive functions have been found to be efficacious in improving psychosocial function (Anaya et al., 2012; Lewandowski et al., 2011; McGurk et al., 2007;

Medalia and Choi, 2009). Improving cognitive function is also demonstrated to improve mood, possibly due to bolstering self-esteem and facilitating positive learning experiences (McGurk et al., 2005; Wykes et al., 1999). Preliminary support for cognitive remediation in BD has also been recently demonstrated by Deckersbach and colleagues (2010) who noted improvement in occupational functioning following the use of a new remediation treatment designed to improve cognition and depressive symptoms.

Improvements in the perception of facial emotions have also been demonstrated in schizophrenia with the use of a specialised intervention program aimed at remediating facial emotion perception difficulties (Frommann et al., 2003; Wölwer et al., 2005). Such remediation has also led to improvements in social relationships (Sachs et al., 2012). To our knowledge, studies examining the efficacy of such a program, or of recently developed emotion regulation therapies, are yet to appear in a BD sample.

Conclusions

There are reasonable theoretical grounds formulated from indirect and preliminary evidence to suggest that social cognition and emotion regulation may be important in the prediction of psychosocial outcome in BD. However, the paucity of direct and explicit research investigating these factors, and their relative contribution in the context of neurocognition and clinical symptomatology leave many questions unanswered. Clearly, future research acknowledging their potential contribution is necessary.

Funding

This research received funding from the Australian Rotary Health/Bipolar Expedition, the Helen McPherson Smith Trust and an Australian Postgraduate Award.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

References

- Addington J and Addington D (1998) Facial affect recognition and information processing in schizophrenia and bipolar disorder. *Schizophrenia Research* 32: 171–181.
- Addington J, Saeedi H and Addington D (2006) Facial affect recognition: A mediator between cognitive and social functioning in psychosis? *Schizophrenia Research* 85: 142–150.
- Altshuler LL, Bearden CE, Green MF, et al. (2008) A relationship between neurocognitive impairment and functional impairment in bipolar disorder: A pilot study. *Psychiatry Research* 157: 289–293.
- Anaya C, Martínez Arán A, Ayuso-Mateos JL, et al. (2012) A systematic review of cognitive remediation for schizo-affective and affective disorders. *Journal of Affective Disorders* 142: 13–21.
- Arts B, Jabben N, Krabbendam L, et al. (2008) Meta-analyses of cognitive functioning in euthymic bipolar patients and their first-degree relatives. *Psychological Medicine* 38: 771–785.
- Atre-Vaidya N, Taylor MA, Seidenberg M, et al. (1998) Cognitive deficits, psychopathology, and psychosocial functioning in bipolar mood disorder. *Neuropsychiatry, Neuropsychology, and Behavioural Neurology* 11: 120–126.
- Australian Bureau of Statistics (2007) *National Survey of Mental Health and Wellbeing: Summary of Results*. Canberra: ABS.
- Balanzá-Martínez V, Tabarés-Seisdedos R, Selva-Vera G, et al. (2005) Persistent cognitive dysfunctions in bipolar I disorder and schizophrenic patients: A 3-year follow-up study. *Psychotherapy and Psychosomatics* 74: 113–119.
- Batty M and Taylor MJ (2003) Early processing of the six basic facial emotional expressions. *Cognitive Brain Research* 17: 613–620.
- Bauer MS, Kirk GF, Gavin C, et al. (2001) Determinants of functional outcome and healthcare costs in bipolar disorder: A high-intensity follow-up study. *Journal of Affective Disorders* 65: 231–241.
- Bauwens F, Tracy A, Pardoën D, et al. (1991) Social adjustment of remitted bipolar and unipolar out-patients. A comparison with age- and sex-matched controls. *The British Journal of Psychiatry* 159: 239–244.
- Bentall RP, Myin-Germeys I, Smith A, et al. (2011) Hypomanic personality, stability of self-esteem and response styles to negative mood. *Clinical Psychology & Psychotherapy* 18: 397–410.
- Black Dog Institute (2012) *What GPs need to know about bipolar disorder*. available at: <http://www.blackdoginstitute.org.au/healthprofessionals/bipolardisorder/overview.cfm>
- Blairy S, Linotte S, Souery D, et al. (2004) Social adjustment and self-esteem of bipolar patients: A multicentric study. *Journal of Affective Disorders* 79: 97–103.
- Bonnín CM, Martínez-Arán A, Torrent C, et al. (2010) Clinical and neurocognitive predictors of functional outcome in bipolar euthymic patients: A long-term, follow-up study. *Journal of Affective Disorders* 121: 156–160.
- Bora E, Eryavuz A, Kayahan B, et al. (2006) Social functioning, theory of mind and neurocognition in outpatients with schizophrenia; mental state decoding may be a better predictor of social functioning than mental state reasoning. *Psychiatry Research* 145: 95–103.
- Bora E, Vahip S, Gonul AS, et al. (2005) Evidence for theory of mind deficits in euthymic patients with bipolar disorder. *Acta Psychiatrica Scandinavica* 112: 110–116.
- Bora E, Yucel M and Pantelis C (2009a) Cognitive endophenotypes of bipolar disorder: A meta-analysis of neuropsychological deficits in euthymic patients and their first-degree relatives. *Journal of Affective Disorders* 113: 1–20.
- Bora E, Yucel M and Pantelis C (2009b) Theory of mind impairment: A distinct trait-marker for schizophrenia spectrum disorders and bipolar disorder? *Acta Psychiatrica Scandinavica* 120: 253–264.
- Bowie CR, Depp C, McGrath JA, et al. (2010) Prediction of real-world functional disability in chronic mental disorders: A comparison of schizophrenia and bipolar disorder. *The American Journal of Psychiatry* 167: 1116–1124.
- Bozikas VP, Kosmidis MH, Tonia T, et al. (2007) Impaired perception of affective prosody in remitted patients with bipolar disorder. *Journal of Neuropsychiatry and Clinical Neurosciences* 19: 436–440.
- Bozikas VP, Tonia T, Fokas K, et al. (2006) Impaired emotion processing in remitted patients with bipolar disorder. *Journal of Affective Disorders* 91: 53–56.
- Brekke J, Kay DD, Lee KS, et al. (2005) Biosocial pathways to functional outcome in schizophrenia. *Schizophrenia Research* 80: 213–225.
- Brissos S, Dias VV, Carita AI, et al. (2008a) Quality of life in bipolar type I disorder and schizophrenia in remission: Clinical and neurocognitive correlates. *Psychiatry Research* 160: 55–62.
- Brissos S, Dias VV and Kapczynski F (2008b) Cognitive performance and quality of life in bipolar disorder. *The Canadian Journal of Psychiatry* 53: 517–524.
- Brüne M (2005) Emotion recognition, ‘theory of mind,’ and social behavior in schizophrenia. *Psychiatry Research* 133: 135–147.

- Burdick KE, Goldberg JF and Harrow M (2010) Neurocognitive dysfunction and psychosocial outcome in patients with bipolar I disorder at 15-year follow-up. *Acta Psychiatrica Scandinavica* 122: 499–506.
- Calabrese JR, Hirschfeld RM, Reed M, et al. (2003) Impact of bipolar disorder on a US community sample. *The Journal of Clinical Psychiatry* 64: 425–432.
- Carpenter D, Clarkin JF, Isman L, et al. (1999) The impact of neuroticism upon married bipolar patients. *Journal of Personality Disorders* 13: 60–66.
- Coryell W, Turvey C, Endicott J, et al. (1998) Bipolar I affective disorder: Predictors of outcome after 15 years. *Journal of Affective Disorders* 50: 109–116.
- Costa RT, Cheniaux E, Rosaes PA, et al. (2011) The effectiveness of cognitive behavioral group therapy in treating bipolar disorder: A randomized controlled study. *Revista Brasileira de Psiquiatria* 33: 144–149.
- Couture SM, Penn DL and Roberts DL (2006) The functional significance of social cognition in schizophrenia: A review. *Schizophrenia Bulletin* 32: S44–S63.
- Cramer V, Torgersen S and Kringlen E (2010) Mood disorders and quality of life. A community study. *Nordic Journal of Psychiatry* 64: 58–62.
- Deckersbach T, Nierenberg AA, Kessler R, et al. (2010) Cognitive rehabilitation for bipolar disorder: An open trial for employed patients with residual depressive symptoms. *CNS Neuroscience & Therapeutics* 16: 298–307.
- Derryberry D and Reed MA (1994) Temperament and attention: Orienting toward and away from positive and negative signals. *Journal of Personality and Social Psychology* 66: 1128–1139.
- Dias VV, Brissos S, Frey BN, et al. (2008) Insight, quality of life and cognitive functioning in euthymic patients with bipolar disorder. *Journal of Affective Disorders* 110: 75–83.
- Dickerson F, Origoni A, Stallings C, et al. (2010) Occupational status and social adjustment six months after hospitalization early in the course of bipolar disorder: A prospective study. *Bipolar Disorders* 12: 10–20.
- Dickerson FB, Boronow JJ, Stallings CR, et al. (2004) Association between cognitive functioning and employment status of persons with bipolar disorder. *Psychiatric Services* 55: 54–58.
- Dion GL, Tohen M, Anthony WA, et al. (1988) Symptoms and functioning of patients with bipolar disorder six months after hospitalization. *Hospital and Community Psychiatry* 39: 652–657.
- Dittmann S, Seemüller F, Schwarz MJ, et al. (2007) Association of cognitive deficits with elevated homocysteine levels in euthymic bipolar patients and its impact on psychosocial functioning: Preliminary results. *Bipolar Disorders* 9: 63–70.
- Ekinci O, Albayrak Y, Ekinci AE, et al. (2011) Relationship of trait impulsivity with clinical presentation in euthymic bipolar disorder patients. *Psychiatry Research* 190: 259–264.
- Elgie R and Morselli PL (2007) Social functioning in bipolar patients: The perception and perspective of patients, relatives and advocacy organizations – a review. *Bipolar Disorders* 9: 144–157.
- Ellenbogen MA and Hodgins S (2004) The impact of high neuroticism in parents on children's psychosocial functioning in a population at high risk for major affective disorder: A family–environmental pathway of intergenerational risk. *Development and Psychopathology* 16: 113–136.
- Fanning JR, Bell MD and Fiszdon JM (2012) Is it possible to have impaired neurocognition but good social cognition in schizophrenia? *Schizophrenia Research* 135: 68–71.
- Freeman AJ, Youngstrom EA, Michalak E, et al. (2009) Quality of life in pediatric bipolar disorder. *Pediatrics* 123: e446–e452.
- Frith CD and Frith U (2007) Social cognition in humans. *Current Biology* 17: R724–R732.
- Frommann N, Streit M and Wölwer W (2003) Remediation of facial affect recognition impairments in patients with schizophrenia: A new training program. *Psychiatry Research* 117: 281–284.
- Fujii DE, Wylie AM and Nathan JH (2004) Neurocognition and long-term prediction of quality of life in outpatients with severe and persistent mental illness. *Schizophrenia Research* 69: 67–73.
- Getz GE, Shear PK and Strakowski SM (2003) Facial affect recognition deficits in bipolar disorder. *Journal of the International Neuropsychological Society* 9: 623–632.
- Godard J, Baruch P, Grondin S, et al. (2012) Psychosocial and neurocognitive functioning in unipolar and bipolar depression: A 12-month prospective study. *Psychiatry Research* 196: 145–153.
- Goldberg JF and Harrow M (2005) Subjective life satisfaction and objective functional outcome in bipolar and unipolar mood disorders: A longitudinal analysis. *Journal of Affective Disorders* 89: 79–89.
- Goldstein TR, Miklowitz DJ and Mullen KL (2006) Social skills knowledge and performance among adolescents with bipolar disorder. *Bipolar Disorders* 8: 350–361.
- Goossens PJJ, Hartong EGTM, Knoppert-van der Klein EAM, et al. (2008) Self-reported psychopathological symptoms and quality of life in outpatients with bipolar disorder. *Perspectives in Psychiatric Care* 44: 275–284.
- Gratz K and Roemer L (2004) Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment* 26: 41–54.
- Gray JA (1981) A critique of Eysenck's theory of personality. In: Eysenck HJ (ed) *A Model for Personality*. New York: Springer, pp.246–276.
- Gray JA (1987) Perspectives on anxiety and impulsivity: A commentary. *Journal of Research in Personality* 21: 493–509.
- Green MF and Nuechterlein KH (1999) Should schizophrenia be treated as a neurocognitive disorder? *Schizophrenia Bulletin* 25: 309–319.
- Green MF, Kern RS, Braff DL, et al. (2000) Neurocognitive deficits and functional outcome in schizophrenia: Are we measuring the right stuff? *Schizophrenia Bulletin* 26: 119–136.
- Gregory VL Jr (2010) Cognitive-behavioral therapy for depression in bipolar disorder: A meta-analysis. *Journal of Evidence-Based Social Work* 7: 269–279.
- Gross JJ (2003) Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology* 85: 348–362.
- Gross JJ (2011) *Handbook of Emotion Regulation*. New York: The Guilford Press, p.672.
- Gruber J, Eidelman P, Johnson SL, et al. (2011) Hooked on a feeling: Rumination about positive and negative emotion in inter-episode bipolar disorder. *Journal of Abnormal Psychology* 120: 956–961.
- Gutiérrez-Rojas L, Gurpegui M, Ayuso-Mateos JL, et al. (2008) Quality of life in bipolar disorder patients: A comparison with a general population sample. *Bipolar Disorders* 10: 625–634.
- Hajnal A, Varga E, Herold R, et al. (2010) P01-44 – Euthymic bipolar patients' deficits in social cognition tasks. *European Psychiatry* 25 (Supplement 1): 264.
- Harvey PD, Wingo AP, Burdick KE, et al. (2010) Cognition and disability in bipolar disorder: Lessons from schizophrenia research. *Bipolar Disorders* 12: 364–375.
- Heerlein A, Richter P, Gonzalez M, et al. (1998) Personality patterns and outcome in depressive and bipolar disorders. *Psychopathology* 31: 15–22.
- Hlatala SA, Kotler JS, McClellan JM, et al. (2010) Interpersonal and social rhythm therapy for adolescents with bipolar disorder: Treatment development and results from an open trial. *Depression and Anxiety* 27: 457–464.
- Hoertnagl CM, Muehlbacher M, Biedermann F, et al. (2011) Facial emotion recognition and its relationship to subjective and functional outcomes in remitted patients with bipolar I disorder. *Bipolar Disorders* 13: 537–544.
- Hofer A, Baumgartner S, Benecke C, et al. (2010) Perception of affective prosody in remitted patients with schizophrenia and bipolar disorder I. *Schizophrenia Research* 117: 213–214.

- Hollon SD and Ponniah K (2010) A review of empirically supported psychological therapies for mood disorders in adults. *Depression and Anxiety* 27: 891–932.
- Hooker C and Park S (2002) Emotion processing and its relationship to social functioning in schizophrenia patients. *Psychiatry Research* 112: 41–50.
- Huxley N and Baldessarini RJ (2007) Disability and its treatment in bipolar disorder patients. *Bipolar Disorders* 9: 183–196.
- Inoue Y, Tonooka Y, Yamada K, et al. (2004) Deficiency of theory of mind in patients with remitted mood disorder. *Journal of Affective Disorders* 82: 403–409.
- Irani F, Seligman S, Kamath V, et al. (2012) A meta-analysis of emotion perception and functional outcomes in schizophrenia. *Schizophrenia Research* 137: 203–211.
- Izard C, Fine S, Schultz D, et al. (2001) Emotion knowledge as a predictor of social behavior and academic competence in children at risk. *Psychological Science* 12: 18–23.
- Jabben N, Arts B, Van Os J, et al. (2010) Neurocognitive functioning as intermediary phenotype and predictor of psychosocial functioning across the psychosis continuum: Studies in schizophrenia and bipolar disorder. *The Journal of Clinical Psychiatry* 71: 764–774.
- Jaeger J, Berns S, Loftus S, et al. (2007) Neurocognitive test performance predicts functional recovery from acute exacerbation leading to hospitalization in bipolar disorder. *Bipolar Disorders* 9: 93–102.
- Johnson SL (2005) Life events in bipolar disorder: Towards more specific models. *Clinical Psychology Review* 25: 1008–1027.
- Johnson SL, Fulford D and Eisner L (2009) Psychosocial mechanisms in bipolar disorder. In: Salzinger K and Serper MR (eds) *Behavioral Mechanisms and Psychopathology: Advancing the Explanation of its Nature, Cause, and Treatment*. Washington, DC: American Psychological Association, pp.77–106.
- Johnson SL, Meyer B, Winett C, et al. (2000) Social support and self-esteem predict changes in bipolar depression but not mania. *Journal of Affective Disorders* 58: 79–86.
- Johnson SL, Ruggero CJ and Carver CS (2005) Cognitive, behavioral, and affective responses to reward: Links with hypomanic symptoms. *Journal of Social and Clinical Psychology* 24: 894–906.
- Jones S, Twiss J and Anderson IM (2009) Do negative cognitive style and personality predict depression symptoms and functional outcomes in severe bipolar and unipolar disorders? *International Journal of Cognitive Therapy* 2: 343–353.
- Judd LL, Akiskal HS, Schettler PJ, et al. (2005) Psychosocial disability in the course of bipolar I and II disorders: A prospective, comparative, longitudinal study. *Archives of General Psychiatry* 62: 1322–1330.
- Judd LL, Schettler PJ, Solomon DA, et al. (2008) Psychosocial disability and work role function compared across the long-term course of bipolar I, bipolar II and unipolar major depressive disorders. *Journal of Affective Disorders* 108: 49–58.
- Jylhä P, Mantere O, Melartin T, et al. (2010) Differences in neuroticism and extraversion between patients with bipolar I or II and general population subjects or major depressive disorder patients. *Journal of Affective Disorders* 125: 42–52.
- Kee KS, Green MF, Mintz J, et al. (2003) Is emotion processing a predictor of functional outcome in schizophrenia? *Schizophrenia Bulletin* 29: 487–497.
- Keenan-Miller D and Miklowitz DJ (2011) Interpersonal functioning in pediatric bipolar disorder. *Clinical Psychology: Science and Practice* 18: 342–356.
- Keitner GI, Solomon DA, Ryan CE, et al. (1996) Prodromal and residual symptoms in bipolar I disorder. *Comprehensive Psychiatry* 37: 362–367.
- Klein HA (1992) Temperament and self-esteem in late adolescence. *Adolescence* 27: 689–694.
- Knowles R, Tai S, Jones SH, et al. (2007) Stability of self-esteem in bipolar disorder: Comparisons among remitted bipolar patients, remitted unipolar patients and healthy controls. *Bipolar Disorders* 9: 490–495.
- Laes JR and Sponheim SR (2006) Does cognition predict community function only in schizophrenia?: A study of schizophrenia patients, bipolar affective disorder patients, and community control subjects. *Schizophrenia Research* 84: 121–131.
- Lahera G, Herreria E, Ruiz-Murugarren S, et al. (2009) P01-195 – Social cognition and general functioning in bipolar disorder. *European Psychiatry* 24 (Supplement 1): S583.
- Lam D and Wong G (1997) Prodromes, coping strategies, insight and social functioning in bipolar affective disorders. *Psychological Medicine* 27: 1091–1100.
- Larner AJ (2008) *Neuropsychological Neurology: The Neurocognitive Impairments of Neurological Disorders*. New York: Cambridge University Press.
- Lee L, Harkness KL, Sabbagh MA, et al. (2005) Mental state decoding abilities in clinical depression. *Journal of Affective Disorders* 86: 247–258.
- Lembke A and Ketter TA (2002) Impaired recognition of facial emotion in mania. *American Journal of Psychiatry* 159: 302–304.
- Leppänen JM and Hietanen JK (2001) Emotion recognition and social adjustment in school-aged girls and boys. *Scandinavian Journal of Psychology* 42: 429–435.
- Lewandowski KE, Eack SM, Hogarty SS, et al. (2011) Is cognitive enhancement therapy equally effective for patients with schizophrenia and schizoaffective disorder? *Schizophrenia Research* 125: 291–294.
- Lopes PN, Salovey P and Straus R (2003) Emotional intelligence, personality, and the perceived quality of social relationships. *Personality and Individual Differences* 35: 641–658.
- Lozano BE and Johnson SL (2001) Can personality traits predict increases in manic and depressive symptoms? *Journal of Affective Disorders* 63: 103–111.
- McGurk S, Twamley EW, Sitzler DI, et al. (2007) A meta-analysis of cognitive remediation in schizophrenia. *The American Journal of Psychiatry* 164: 1791–1802.
- McGurk SR, Mueser KT and Pascaris A (2005) Cognitive training and supported employment for persons with severe mental illness: One-year results from a randomized controlled trial. *Schizophrenia Bulletin* 31: 898–909.
- MacQueen GM, Young LT and Joffe RT (2001) A review of psychosocial outcome in patients with bipolar disorder. *Acta Psychiatrica Scandinavica* 103: 163–170.
- MacQueen GM, Young LT, Robb JC, et al. (2000) Effect of number of episodes on wellbeing and functioning of patients with bipolar disorder. *Acta Psychiatrica Scandinavica* 101: 374–381.
- Magnus K, Diener E, Fujita F, et al. (1993) Extraversion and neuroticism as predictors of objective life events: A longitudinal analysis. *Journal of Personality and Social Psychology* 65: 1046–1053.
- Malhi GS, Ivanovski B, Hadzi-Pavlovic D, et al. (2007) Neuropsychological deficits and functional impairment in bipolar depression, hypomania and euthymia. *Bipolar Disorders* 9: 114–125.
- Mansell W and Pedley R (2008) The ascent into mania: A review of psychological processes associated with the development of manic symptoms. *Clinical Psychology Review* 28: 494–520.
- Martínez-Arán A, Penadés R, Vieta E, et al. (2002) Executive function in patients with remitted bipolar disorder and schizophrenia and its relationship with functional outcome. *Psychotherapy and Psychosomatics* 71: 39–46.
- Martínez-Arán A, Torrent C, Solé B, et al. (2011) Functional remediation for bipolar disorder. *Clinical Practice and Epidemiology in Mental Health* 7: 112–116.
- Martínez-Arán A, Vieta E, Colom F, et al. (2004) Cognitive impairment in euthymic bipolar patients: Implications for clinical and functional outcome. *Bipolar Disorders* 6: 224–232.
- Martínez-Arán A, Vieta E, Torrent C, et al. (2007) Functional outcome in bipolar disorder: The role of clinical and cognitive factors. *Bipolar Disorders* 9: 103–113.

- Martino DJ, Igoa A, Marengo E, et al. (2011a) Neurocognitive impairments and their relationship with psychosocial functioning in euthymic bipolar II disorder. *Journal of Nervous and Mental Disease* 199: 459–464.
- Martino DJ, Marengo E, Igoa A, et al. (2009) Neurocognitive and symptomatic predictors of functional outcome in bipolar disorders: A prospective 1 year follow-up study. *Journal of Affective Disorders* 116: 37–42.
- Martino DJ, Strejilevich SA, Fassi G, et al. (2011b) Theory of mind and facial emotion recognition in euthymic bipolar I and bipolar II disorders. *Psychiatry Research* 189: 379–384.
- Mathews JR and Barch DM (2010) Emotion responsivity, social cognition, and functional outcome in schizophrenia. *Journal of Abnormal Psychology* 119: 50–59.
- Medalia A and Choi J (2009) Cognitive remediation in schizophrenia. *Neuropsychology Review* 19: 353–364.
- Mennin DS and Fresco DM (2009) Emotion regulation as an integrative framework for understanding and treating psychopathology. In: Kring AM and Sloan DM (eds) *Emotion Regulation and Psychopathology: A Transdiagnostic Approach to Etiology and Treatment*. New York: Guilford Publications, pp. 356–379.
- Meyer B, Johnson SL and Winters R (2001) Responsiveness to threat and incentive in bipolar disorder: Relations of the BIS/BAS scales with symptoms. *Journal of Psychopathology and Behavioral Assessment* 23: 133–143.
- Mitchell JT, Kimbrel NA, Hundt NE, et al. (2007) An analysis of reinforcement sensitivity theory and the five-factor model. *European Journal of Personality* 21: 869–887.
- Mitchell PB, Slade T and Andrews G (2004) Twelve-month prevalence and disability of DSM-IV bipolar disorder in an Australian general population survey. *Psychological Medicine* 34: 777–785.
- Morriss R, Scott J, Paykel E, et al. (2007) Social adjustment based on reported behaviour in bipolar affective disorder. *Bipolar Disorders* 9: 53–62.
- Mueser KT, Doonan R, Penn DL, et al. (1996) Emotion recognition and social competence in chronic schizophrenia. *Journal of Abnormal Psychology* 105: 271–275.
- Mur M, Portella MJ, Martínez-Arán A, et al. (2009) Influence of clinical and neuropsychological variables on the psychosocial and occupational outcome of remitted bipolar patients. *Psychopathology* 42: 148–156.
- Murphy D and Cutting J (1990) Prosodic comprehension and expression in schizophrenia. *Journal of Neurology, Neurosurgery & Psychiatry* 53: 727–730.
- O'Shea R, Poz R, Michael A, et al. (2010) Ecologically valid cognitive tests and everyday functioning in euthymic bipolar disorder patients. *Journal of Affective Disorders* 125: 336–340.
- Pavlova B, Uher R, Dennington L, et al. (2011) Reactivity of affect and self-esteem during remission in bipolar affective disorder: An experimental investigation. *Journal of Affective Disorders* 134: 102–111.
- Perroud N, Baud P, Mouthon D, et al. (2011) Impulsivity, aggression and suicidal behavior in unipolar and bipolar disorders. *Journal of Affective Disorders* 134: 112–118.
- Persad SM and Polivy J (1993) Differences between depressed and nondepressed individuals in the recognition of and response to facial emotional cues. *Journal of Abnormal Psychology* 102: 358–368.
- Pinkham AE and Penn DL (2006) Neurocognitive and social cognitive predictors of interpersonal skill in schizophrenia. *Psychiatry Research* 143: 167–178.
- Pollice R, Roncone R, Falloon I, et al. (2002) Is theory of mind in schizophrenia more strongly associated with clinical and social functioning than with neurocognitive deficits? *Psychopathology* 35: 280–288.
- Pope M, Dudley R and Scott J (2007) Determinants of social functioning in bipolar disorder. *Bipolar Disorders* 9: 38–44.
- Quilty LC, Sellbom M, Tackett JL, et al. (2009) Personality trait predictors of bipolar disorder symptoms. *Psychiatry Research* 169: 159–163.
- Reed MA and Derryberry D (1995) Temperament and attention to positive and negative trait information. *Personality and Individual Differences* 18: 135–147.
- Robb JC, Cooke RG, Devins GM, et al. (1997) Quality of life and lifestyle disruption in euthymic bipolar disorder. *Journal of Psychiatric Research* 31: 509–517.
- Rosa AR, Reinares M, Franco C, et al. (2009) Clinical predictors of functional outcome of bipolar patients in remission. *Bipolar Disorders* 11: 401–409.
- Rossell SL and Van Rheenen TE (2013) Theory of mind performance using a story comprehension task in bipolar mania compared to schizophrenia and healthy controls. *Cognitive Neuropsychiatry* 18: 409–421.
- Rowe LS and Morris AM (2012) Patient and partner correlates of couple relationship functioning in bipolar disorder. *Journal of Family Psychology* 26: 328–337.
- Rucklidge JJ (2006) Psychosocial functioning of adolescents with and without paediatric bipolar disorder. *Journal of Affective Disorders* 91: 181–188.
- Saarni SI, Viertiö S, Perälä J, et al. (2010) Quality of life of people with schizophrenia, bipolar disorder and other psychotic disorders. *The British Journal of Psychiatry* 197: 386–394.
- Sachs G, Winklbaur B, Jagsch R, et al. (2012) Training of affect recognition (TAR) in schizophrenia—Impact on functional outcome. *Schizophrenia Research* 138: 262–267.
- Sánchez-Moreno J, Martínez-Arán A, Tabarés-Seisdedos R, et al. (2009) Functioning and disability in bipolar disorder: An extensive review. *Psychotherapy and Psychosomatics* 78: 285–297.
- Sánchez-Morla EM, Barabash A, Martínez-Vizcaíno V, et al. (2009) Comparative study of neurocognitive function in euthymic bipolar patients and stabilized schizophrenic patients. *Psychiatry Research* 169: 220–228.
- Schenkel LS, Marlow-O'Connor M, Moss M, et al. (2008) Theory of mind and social inference in children and adolescents with bipolar disorder. *Psychological Medicine* 38: 791–800.
- Schenkel LS, Spaulding WD and Silverstein SM (2005) Poor pre-morbid social functioning and theory of mind deficit in schizophrenia: Evidence of reduced context processing? *Journal of Psychiatric Research* 39: 499–508.
- Schultz D, Izard CE, Ackerman BP, et al. (2001) Emotion knowledge in economically disadvantaged children: Self-regulatory antecedents and relations to social difficulties and withdrawal. *Development and Psychopathology* 13: 53–67.
- Scott J and Pope M (2003) Cognitive styles in individuals with bipolar disorders. *Psychological Medicine* 33: 1081–1088.
- Serretti A, Cavallini MC, Macciardi F, et al. (1999) Social adjustment and self-esteem in remitted patients with mood disorders. *European Psychiatry* 14: 137–142.
- Shapira B, Zislín J, Gelfin Y, et al. (1999) Social adjustment and self-esteem in remitted patients with unipolar and bipolar affective disorder: A case-control study. *Comprehensive Psychiatry* 40: 24–30.
- Sierra P, Livianos L and Rojo L (2005) Quality of life for patients with bipolar disorder: Relationship with clinical and demographic variables. *Bipolar Disorders* 7: 159–165.
- Simon GE, Ludman EJ, Unützer J, et al. (2008) Severity of mood symptoms and work productivity in people treated for bipolar disorder. *Bipolar Disorders* 10: 718–725.
- Simonsen C, Sundet K, Vaskinn A, et al. (2010) Psychosocial functioning in schizophrenia and bipolar disorder: Relationship to neurocognition and clinical symptoms. *Journal of the International Neuropsychological Society* 16: 771–783.
- Solé B, Bonnín CM, Torrent C, et al. (2012) Neurocognitive impairment and psychosocial functioning in bipolar II disorder. *Acta Psychiatrica Scandinavica* 125: 309–317.
- Sparks A, McDonald S, Lino B, et al. (2010) Social cognition, empathy and functional outcome in schizophrenia. *Schizophrenia Research* 122: 172–178.

- Srivastava S, Bhatia MS, Sharma V, et al. (2010) Health-related quality of life in bipolar disorder patients and their caregivers. *International Journal of Mental Health* 39: 3–15.
- Tabarés-Seisdedos R, Balanzá-Martínez V, Sánchez-Moreno J, et al. (2008) Neurocognitive and clinical predictors of functional outcome in patients with schizophrenia and bipolar I disorder at one-year follow-up. *Journal of Affective Disorders* 109: 286–299.
- Torres IJ, DeFreitas CM, DeFreitas VG, et al. (2011) Relationship between cognitive functioning and 6-month clinical and functional outcome in patients with first manic episode bipolar I disorder. *Psychological Medicine* 41: 971–982.
- Tsai S-Y, Lee J-C and Chen C-C (1999) Characteristics and psychosocial problems of patients with bipolar disorder at high risk for suicide attempt. *Journal of Affective Disorders* 52: 145–152.
- Tufrey K and Coulston C (2010) Cognitive remediation for bipolar disorder: Adapting from models used in schizophrenia and acquired brain injury. *Acta Neuropsychiatrica* 22: 311–313.
- Urošević S, Abramson LY, Alloy LB, et al. (2010) Increased rates of events that activate or deactivate the behavioral approach system, but not events related to goal attainment, in bipolar spectrum disorders. *Journal of Abnormal Psychology* 119: 610–615.
- Urošević S, Abramson LY, Harmon-Jones E, et al. (2008) Dysregulation of the behavioral approach system (BAS) in bipolar spectrum disorders: Review of theory and evidence. *Clinical Psychology Review* 28: 1188–1205.
- Van der Gucht EM, Morriss RMD, Lancaster GP, et al. (2009) Psychological processes in bipolar affective disorder: Negative cognitive style and reward processing. *British Journal of Psychiatry* 194: 146–151.
- Van Rheenen TE and Rossell SL (2013a) Genetic and neurocognitive foundations of emotion abnormalities in bipolar disorder. *Cognitive Neuropsychiatry* 18: 168–207.
- Van Rheenen TE and Rossell SL (2013b) Is the non-verbal behavioural emotion-processing profile of bipolar disorder impaired? A critical review. *Acta Psychiatrica Scandinavica* 128: 163–178.
- Vaskinn A, Sundet K, Friis S, et al. (2008) Emotion perception and learning potential: Mediators between neurocognition and social problem-solving in schizophrenia? *Journal of the International Neuropsychological Society* 14: 279–288.
- Vauth R, Rüşch N, Wirtz M, et al. (2004) Does social cognition influence the relation between neurocognitive deficits and vocational functioning in schizophrenia? *Psychiatry Research* 128: 155–165.
- Wallace CJ (1984) Community and interpersonal functioning in the course of schizophrenic disorders. *Schizophrenia Bulletin* 10: 233–257.
- Wallace JF and Newman JP (1998) Neuroticism and the facilitation of the automatic orienting of attention. *Personality and Individual Differences* 24: 253–266.
- Wallace JF, Newman JP and Bachorowski J-A (1991) Failures of response modulation: Impulsive behavior in anxious and impulsive individuals. *Journal of Research in Personality* 25: 23–44.
- Wingo AP, Baldessarini RJ, Holtzheimer PE, et al. (2010) Factors associated with functional recovery in bipolar disorder patients. *Bipolar Disorders* 12: 319–326.
- Wingo AP, Harvey PD and Baldessarini RJ (2009) Neurocognitive impairment in bipolar disorder patients: Functional implications. *Bipolar Disorders* 11: 113–125.
- Wölwer W, Frommann N, Halfmann S, et al. (2005) Remediation of impairments in facial affect recognition in schizophrenia: Efficacy and specificity of a new training program. *Schizophrenia Research* 80: 295–303.
- Wykes T, Reeder C, Corner J, et al. (1999) The effects of neurocognitive remediation on executive processing in patients with schizophrenia. *Schizophrenia Bulletin* 25: 291–307.
- Yen C-F, Cheng C-P, Huang C-F, et al. (2009) Relationship between psychosocial adjustment and executive function in patients with bipolar disorder and schizophrenia in remission: The mediating and moderating effects of insight. *Bipolar Disorders* 11: 190–197.
- Yip JA and Martin RA (2006) Sense of humor, emotional intelligence, and social competence. *Journal of Research in Personality* 40: 1202–1208.
- Yoo SH, Matsumoto D and LeRoux JA (2006) The influence of emotion recognition and emotion regulation on intercultural adjustment. *International Journal of Intercultural Relations* 30: 345–363.
- Zaretsky A (2003) Targeted psychosocial interventions for bipolar disorder. *Bipolar Disorders* 5: 80–87.