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The Role of Emotional Intelligence in the Quality of Life of Individuals with Bipolar I Disorder

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THE ROLE OF EMOTIONAL INTELLIGENCE IN THE QUALITY OF LIFE
OF INDIVIDUALS WITH BIPOLAR I DISORDER

By

Daniel Fulford

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THE ROLE OF EMOTIONAL INTELLIGENCE IN THE QUALITY OF LIFE
OF INDIVIDUALS WITH BIPOLAR I DISORDER

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   Bipolar I disorder (BD) is one of the leading causes of disability among adults. Despite the fact that those with BD are at significantly greater risk for experiencing psychosocial hardship, many with the disorder function quite well. Researchers have shown this variability in quality of life to be partly explained by symptom severity, educational attainment, illness characteristics, and cognitive variables (e.g., executive function). The current study extends this research by examining the role of emotional intelligence in the quality of life and social and occupational functioning of people with BD. I hypothesized a significant proportion of the variance in quality of life and social and occupational functioning would be explained by emotional intelligence, above and beyond the variance explained by the aforementioned variables. Forty-two participants with BD were recruited and completed a battery of measures to assess quality of life, cognition, and emotional intelligence. Results indicated that emotional intelligence, as measured by the Mayer-Salovey-Caruso Emotional Intelligence Test, did not explain any unique variance in quality of life. Self-reported emotional intelligence, on the other hand, did explain unique variance in both subjective well-being and social functioning.

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CHAPTER 1: INTRODUCTION

Bipolar I disorder (BD) is a devastating illness. At the turn of the century, BD was the fifth leading cause of disability among persons aged 15 to 44, with more years of life lost to disability than both HIV/AIDS and road traffic accidents (World Health Organization, 2001). Although BD is an episodic illness involving periods of remission, nearly three-quarters of people with the disorder relapse within five years, even while receiving adequate pharmacological treatment (Gitlin, Swendsen, Heller, & Hammen, 1995). Most troubling, the lifetime rate of at least one suicide attempt is as high as 50% among this population (Simpson & Jamison, 1999), with as many as 19% of people with BD dying from suicide (Isometsa, Henriksson, Aro, & Lonnqvist, 1994).

Medical comorbidity in BD is common and its effect on the disorder can be detrimental (Kupfer, 2005). For example, during the year after diagnosis of BD, total health care costs are more than four times that of the average individual (Knoth, Chen, & Tafesse, 2004). What is more, family members of those with BD encounter even more financial strain than those with schizophrenia (Gianfrancesco, Wang, & Yu, 2005). Thus, the quality of life of those with BD is often compromised, with significant personal and societal burdens associated with the disorder. In fact, some have proposed that improvements in quality of life should be considered an important treatment target for those with BD (see Sachs & Rush, 2003).

In the sections that follow, I provide rationale for considering the role of emotional intelligence in the quality of life and functioning of those with BD. I begin by summarizing the literature relevant to definitions of quality of life (QoL) and describe a rationale for the definition I will use. I then discuss literature regarding the established

correlates of QoL and functioning in BD, including illness characteristics, demographic variables, and cognitive factors. Finally, I describe proposed hypotheses, methods, and data analyses for the current study.

Quality of Life

The QoL construct is quite broad, defined by both the subjective account of one's overall satisfaction with life and the objective measurement of life circumstances (for a review, see Gladis, Gosch, Dishuk, & Crits-Christoph, 1999). Katschnig (1997) defined QoL as "a loosely related body of work on psychological well-being, social and emotional functioning, health status, functional performance, life satisfaction, social support, and standard of living, whereby normative, objective, and subjective indicators of physical, social and emotional functioning are all used" (p. 6). As can be seen from this definition, QoL is a broad construct that is difficult to measure (see Muldoon, Barger, Flory, & Manuck, 1998).

Two primary methods have been used to identify QoL. The first, subjective well-being (SWB; Diener 1984), examines self-reported life satisfaction (e.g., happiness, fulfillment, etc.). The other examines objective indices of social, economic, and health-related variables that are indicators of how well one's life needs are being met (e.g., Andrews & Withey, 1976).

Several researchers have documented only modest correlations between subjective and objective indicators of QoL (e.g., Headey & Wearing, 1992). In a review of studies using both subjective and objective measures of QoL (Cummins, 2000), subjective measures correlated with each other at an average level of .38 and objective measures correlated with each other at an average level of .32. Subjective measures

correlated with objective measures, however, at a nonsignificant average level of .12. Thus, differences in agreement between the two methods of measurement have made research in QoL a difficult endeavor. Indeed, the distinction between subjective and objective accounts of QoL "lies at the heart of an integrated and comprehensive understanding of the construct…and if QoL is to embrace the totality of human life then both [objective] and [subjective] dimensions must surely be included" (Cummins, 2000, p. 55).

Within BD, there is at least some convergence among these different measures. One measure of social functioning, the presence of a strong supportive relationship, was significantly related to higher QoL among those with BD, including higher SWB (Gutiérrez-Rojas et al., 2008) and positive employment status (Hammen, Gitlin, & Altshuler, 2000).

It is equally important to note that the effects of psychiatric symptoms, recent life events, and poor insight on self-reported QoL are often profound (Atkinson, Zibin, & Chuang, 1997; Katschnig, 1997). That is, these factors will often influence, and even distort, subjective accounts of QoL. Thus, it is important to consider these factors when evaluating QoL, and also to include the objective assessment of QoL in combination with subjective accounts. Indeed, researchers have recently expressed the importance of assessing these different domains of QoL in BD (e.g., Brieger, Röttig, Röttig, Marneros, & Priebe, 2007).

Researchers at the World Health Organization were among the first to combine these two methods in a cogent definition of QoL: "Quality of life is the individual's perception of their position in life in the context of culture and value systems in which

they live and in relation to their goals, expectations, standards, and concerns" (Harper &

Power, 1998, p. 551). In this definition, the roles of both one's subjective satisfaction

with life and objective contextual factors are taken into account. Thus, in the current

document I use the term QoL to refer to both subjective ratings of well-being and

objective indicators of social and occupational functioning. I will also examine the

influence of the proposed correlates on all three branches of QoL (SWB, social

functioning, and occupational functioning).

Quality of life in bipolar disorder. Researchers have long documented

decrements in both SWB (Atkinson, Zibin, & Chuang, 1997; Michalak, Yatham, Kolesar,

& Lam, 2006) and objective indicators of social (Blairy et al., 2004; Elgie & Morselli,

2007) and occupational (Goldberg, Harrow, & Grossman, 1995; Harrow, 1990)

functioning in those with BD. Those with BD endorse lower SWB both during mood

episodes and during remission compared to the general population. In addition, those

with BD have significantly more difficulty with both obtaining and maintaining

employment and with social relationships than those without the disorder. The following

sections provide an overview of these findings.

Subjective indicators of quality of life. Several researchers have documented

decrements in SWB among persons with BD compared to the general population

(Atkinson, Zibin, & Chuang, 1997; Goossens, Hartong, Knoppert-van der Klein, & van

Achterberg, 2008; Michalak, Yatham, Kolesar, & Lam, 2006; Sierra, Livianos, & Rojo,

2005). Given the relationship between current mood state and SWB mentioned above,

the question remains whether these decrements result from the experience of current

symptoms or are present during remission. Indeed, in two recent studies of those with

BD depressive symptoms were directly related to SWB, even when participants were in remission (Dias, Brissos, Frey, & Kapczinski, 2008; Gazzalle et al., 2006). Vojta and colleagues (2001) documented similar findings in a study of patients with BD during mood episodes. The authors concluded that while mania was associated with reduced levels of SWB, depressive symptoms contributed most strongly to these ratings.

Symptoms may not always be the driving force behind lower SWB, however. Within the workplace, problems associated with stigma, disclosure, illness management, and interpersonal relations have been shown to adversely affect the self-reported work experience for those with BD (Michalak, Yatham, Maxwell, Hale, & Lam, 2007). In addition, lower levels of SWB have been documented in persons with BD during remission relative to the general population (Fagiolini et al., 2005; Robb, Cooke, Devins, Young, & Joffe, 1997). Coryell and colleagues (1993) showed that BD was associated with significant impairment in enjoyment of recreation activities and interpersonal relationships, even when participants were asymptomatic. In a two-year longitudinal study of euthymic women with BD who, at some point during the study, were psychiatrically hospitalized, Romans and McPherson (1992) documented major self-identified problems in marital and other close relationships in those who became hospitalized. These problems were more common among those who experienced manic versus depressed episodes. Thus, those with BD, compared to those without a psychological disorder, report lower SWB both in remission and during mood episodes.

Objective indicators of quality of life. BD is also associated with significant problems in objective indicators of QoL, including social and occupational functioning. Several studies have shown that those with BD have severe difficulty maintaining

employment, significantly more so than those with unipolar depression (Goldberg,

Harrow, & Grossman, 1995; Harrow, 1990; Kogan et al., 2004). More specifically, those

with BD experience significantly more hours of absence from employment and larger

disability payments than matched controls (Matza, de Lissovoy, Sasane, Pesa, &

Mauskopf, 2004). After hospitalization for mania, almost one quarter of participants in

one study remained unemployed for one year (Harrow, Goldberg, Grossman, & Meltzer,

1990). In a review of studies assessing psychosocial functioning in BD, the authors

reported that 30-60% of those with the disorder do not fully regain social or occupational

functioning between episodes (MacQueen, Young, & Joffe, 2001). What is more,

impairment in social functioning may be present even before the manifestation of BD. In

one study, parents of adults with BD were asked to recall the functioning of their

offspring during childhood and adolescence (Cannon et al., 1997). Parents of those with

BD rated their offspring as more socially impaired during childhood and adolescence

than did the parents of those without BD.

Even when symptoms are adequately controlled after hospitalization,

occupational functioning remains impaired. For example, Dion and colleagues (1988)

found that although 80% of participants were either symptom free or mildly symptomatic

six months after hospitalization, over 40% of these recovered patients remained

unemployed. In fact, Hammen and colleagues (2000) found that symptoms and

hospitalizations accounted for only 16% of the variance in occupational functioning.

These findings suggest that symptoms alone cannot explain the serious functional

problems among those with BD.

Objective indicators of social functioning also show impairment among persons with BD (Blairy et al., 2004; Elgie & Morselli, 2007; Romans & McPherson, 1992) and people at risk for mania (Calabrese et al., 2003), albeit less severely than in occupational functioning (e.g., Gitlin, Swendsen, Heller, & Hammen, 1995; Harrow et al., 1990). Those with BD receive significantly less social support (i.e., the presence of a person with whom one could confide) than healthy controls (Kennedy, Thompson, Stancer, Roy, & Persad, 1983). Similarly, in a longitudinal study of outcomes in BD, Tsai and colleagues (2001) found that social status, as measured by the Strauss-Carpenter scales (Strauss & Carpenter, 1972), was significantly impaired even when participants were adherent to psychotropic medication.

In sum, those with BD experience significant deficits in QoL compared to those without the disorder. Lower SWB is present both during mood episodes and during remission, and those with BD experience significant difficulties with objective indicators of QoL, including employment and social relationships. What, then, are the correlates of QoL among those with BD?

Correlates of quality of life in bipolar disorder. Despite the fact that those with BD are at significantly greater risk for experiencing psychosocial hardship, several studies have found that one-quarter of those with BD fall within the "good" or better range of social and occupational functioning (Gitlin et al., 1995; Hammen, Gitlin, & Altshuler, 2000; Harrow et al., 1990), with as much as 15% in the "excellent" range (Hammen, Gitlin, & Altshuler, 2000). Indeed, researchers over the past century have commented on the overrepresentation of heightened ambition and success in those with BD and their family members (see Johnson, 2005). Historical accounts of renowned

poets, artists, and musicians suggest the overrepresentation of BD among these people (Jamison, 1993). Thus, extreme variation in QoL appears to be part of the puzzle of BD.

What accounts for this variability in QoL? I begin by describing several aspects of symptoms and demographic variables that are related to QoL among those with BD. I will then discuss the role of cognitive variables, including executive function and social cognition, in QoL within the disorder.

Illness characteristics and demographic variables as correlates of quality of life. The number of previous episodes of depression and mania has been shown in several studies to be highly correlated with SWB (Loftus, 2004; MacQueen et al., 2000) and occupational functioning (Di Marzo et al., 2006; Dickerson et al., 2004). Beyond previous symptoms, as noted above, current symptoms contribute to lower SWB. Nonetheless, current symptoms account for only a limited proportion of the variance in occupational functioning (Hammen, Gitlin, & Altshuler, 2000) and, as such, cannot fully explain QoL in those with BD.

Comorbidity appears to be related to significantly worse QoL. In a study of outpatients with BD, presence of a current comorbid anxiety disorder at baseline predicted significantly lower SWB and diminished clinician-rated functioning over a one-year follow-up (Otto et al., 2006). Current symptoms of anxiety, as well as current or past alcohol abuse, were also found to be related to lower SWB and less full-time employment in a study of euthymic outpatients with BD (Kusznir, Cooke, & Young, 2000). In several studies, personality disorder comorbidity has been associated with more severe symptoms over time (Bieling et al., 2003; Colom et al., 2004; Dunayevich et al., 2000). In sum, the extreme variability in QoL observed in people with BD appears to

be related to illness characteristics—particularly illness history—current symptoms, and comorbidity.

Beyond illness characteristics, demographic variables have been shown to be related to QoL among those with BD. Some findings, though, have been inconsistent. Female gender in one study (Frangou, 2002) and male gender in another (Tsai et al., 2001) were related to higher SWB. In addition, high level of educational attainment has been shown to be related to higher SWB and better clinician-rated functioning among those with BD (Goldberg, Harrow, & Grossman, 1995; Kessler, Foster, Saunders, & Stang, 1995). Higher maternal education was also related to current employment status in another study of those with BD (Dickerson et al., 2004).

In sum, illness characteristics (e.g., symptoms, episode history, comorbidity) and demographic variables (most specifically educational attainment) have been found to be related to—and predictive of—QoL among those with BD. Beyond these factors, researchers have further examined correlates of QoL in BD that may be targeted through prevention and intervention efforts.

Cognitive correlates of qualify of life in bipolar disorder. Researchers have recently begun to examine the role of cognitive factors in QoL among those with BD. Much of this research has sprouted from findings in the schizophrenia literature documenting robust positive relationships between cognition and QoL within this disorder (Green, 2006). More specifically, cognitive variables such as memory, attention, executive function and social cognition have been found to account for between 25% and 50% of the variance in social and occupational functioning within schizophrenia (Green, Kearn, & Heaton, 2004; Vauth, Rusch, Wirtz, & Corrigan, 2004). One facet of social

cognition, emotional intelligence, has received some support as a correlate of social functioning in schizophrenia (e.g., Mueser et al., 1996).

In this section I will cover research documenting general deficits in cognition among those with BD. I will then discuss findings on the relationship between two well-researched facets of cognition—executive function and social cognition—and QoL in BD. Finally, I will discuss the role of one specific facet of social cognition, emotional intelligence, in the QoL of those with BD.

Preliminary research has documented deficits in cognition among those with BD as compared to healthy controls. Researchers have shown that people with BD, during both symptomatic and euthymic periods, show deficits in cognition (e.g., memory, executive function, attention, social information processing) compared to those without the disorder (Kerr, Dunbar, & Bentall, 2003; Quraishi & Frangou, 2002; Robinson et al., 2006; Savitz et al., 2005). In a recent meta-analysis of over 26 studies of cognition in those with BD during euthymic periods, Robinson and colleagues (2006) showed that—with the exception of IQ and years of education—those with BD performed significantly worse than controls on all measures of cognition including executive function, verbal learning and memory, and attention and psychomotor speed. Thus, similar to research findings in schizophrenia, cognitive impairment has been considered a core feature of BD (Green, 2006). Some of these deficits have also been shown to be present in unaffected first-degree relatives of those with BD (Arts, Jabben, Krabbendam, & van Os, 2008), making cognitive impairment a target in the quest to identify endophenotypes and treatment of the disorder (Green, 2006).

Executive function. Executive function (EF) refers to a specific set of cognitive abilities associated with planning, initiating, and monitoring complex goal-directed behavior, with the primary anatomical substrates being localized in the frontal lobes of the cortex (Royall et al., 2002). Impaired EF is associated with psychological disorders such as attention-deficit/hyperactivity disorder (Barkley, 1997) schizophrenia (Hoff & Kremen, 2002), and autistic disorder (Ozonoff, Pennington, & Rogers, 1991). Thus, problems with the ability to plan, initiate, and monitor complex behaviors have been found to be associated with psychopathology.

In most studies thus far, EF has been shown to be impaired in those with BD (e.g., Althshuler et al., 2004; Olley et al., 2005) and in their first-degree relatives (e.g., Szoke et al., 2006) compared to healthy controls. In the meta-analysis of cognition in BD mentioned above (Robinson et al., 2006), the authors found robust differences (effect sizes over .80) between those with BD and healthy controls among measures of EF, such as the Trail-Making Test – B and the Wisconsin Card Sorting Test. The authors found small to medium effect sizes among measures of verbal memory, attention, and psychomotor speed.

Impairment in QoL is associated with EF deficits among those with BD. In a recent study, Altshuler and colleagues (2007) examined EF among employed and unemployed veterans with BD using the Executive Interview, which assesses set-shifting and executing tasks during interference (EXIT; Royall, Mahurin, & Gray, 1992). Unemployed veterans exhibited greater impairment in EF than those veterans who were employed. Even though lifetime psychiatric hospitalizations and number of psychotropic medications prescribed had significant associations with employment status, EF still

contributed significant variance in employment status when these variables were controlled. In two separate studies of euthymic outpatients with BD (Olley et al., 2005; Zubieta, Huguelet, O'Neil, & Giordani, 2001), researchers have found a strong relationship between EF (measured via set-shifting) and social and occupational functioning, as measured by the Social and Occupational Functional Assessment Scale (SOFAS; Goldman, Skodol, & Lave, 1992).

In sum, those with BD and their first-degree relatives exhibit pronounced cognitive impairments in comparison to healthy controls. In addition, these impairments, especially in the area of EF, are associated with decrements in QoL. That is, among those with BD, deficits in inhibition and set-shifting are associated with difficulty in employment and clinician-rated social and occupational functioning.

Social cognition. Social cognition has been most broadly defined as the process by which people make sense of other people (Fiske & Taylor, 1984). More specifically, social cognition concerns the encoding, storing, and retrieving of social information and applying this information within the social context (Damasio, 1994). Structures believed to be involved in social cognition include the amygdala (Adolphs, Tranel, & Damasio, 1998), ventromedial prefrontal cortex (Schoenbaum, Chiba & Gallagher, 1998), and somatosensory cortices (Adolphs, 1999). As social cognition encompasses a broad range of phenomena, there are myriad ways to measure the construct. Aspects of social cognition measured may include facial affect recognition (Ekman & Friesen, 1974), perspective taking (David et al., 2006), and joint attention (Hood, Willen, & Driver, 1998). Deficits in social cognition have been associated with a variety of psychological disorders, most often schizophrenia (e.g., Penn, Sanna, & Roberts, 2008) and autistic

disorder (e.g., Baron-Cohen, 1997). These deficits are believed to be stable characteristics that do not change with symptom levels (Mueser, Bellack, Douglas, & Morrison, 1991).

There is currently a paucity of research examining deficits in social cognition among those with BD. In one study, researchers examined social cognition using the Picture Arrangement subtest of the Wechsler Adult Intelligence Scale among patients with BD, schizophrenia, and schizoaffective disorder (Shean, Murphy, & Meyer, 2005). The authors found no differences in social cognitive impairments among the diagnoses when premorbid intelligence was controlled. The significant correlates of social cognitive impairments in this study included negative and disorganized symptoms. Two other studies have found deficits in Theory of Mind (ToM), or the ability to use social cues to infer others' mental states, among people with BD during euthymia (Bora et al., 2005; Olley et al., 2001). These studies, however, did not find a relationship between ToM and QoL.

Emotional intelligence. Emotional intelligence (EI) refers to a set of social cognitive abilities specifically related to emotions. EI has been conceptualized as "the ability to engage in sophisticated information processing about one's own and others' emotions and the ability to use this information as a guide to thinking and behavior" (p. 503; Mayer, Salovey, & Caruso, 2008). Mayer and Salovey (1997) have used what they call the Four-Branch model to define EI abilities. In this model, emotional perception (the accurate perception of one's own and others' emotions), identification (the use of emotions to facilitate thought), understanding (understanding emotions and the signals they convey), and management (managing emotions to attain goals) are considered skills

contributing to one's overall level of EI. Thus, EI includes a set of social cognitive abilities specific to emotional material.

EI has been conceptualized as a type of intelligence as opposed to a set of preferences, values, or personality traits (Ciarrochi, Chan, & Caputi, 2000). Mayer and colleagues (2000) stated the standard criteria a construct must meet before it can be considered an intelligence. First, it must be operationalized as a set of abilities. Second, the abilities defined by the intelligence must be correlated with one another and with other types of intelligences (while also displaying unique variance). Third, the abilities should develop with age and experience. As such, the authors contended that EI should be assessed in ways similar to the assessment of other intelligences. The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey, & Caruso, 2002) was designed to assess EI as an intelligence, and is the only such ability-based measure currently available that assesses four aspects of EI and provides a comparative profile. It is important to note that findings from ability-based measures of EI are distinct from those of self-report measures of EI (cf. Zeidner, Shani-Zinovich, Matthews, & Roberts, 2005). Additionally, self-report measures of EI have been found to be largely unrelated (zero to weak correlations) to measures of general intelligence (e.g., Derksen, Cramer, & Katzko, 2002). Thus, although some researchers have shown that self-reported EI abilities are significantly negatively related to anxiety and depression (Fernández-Berrocal, Alcaide, Extremera, & Pizarro, 2006; Martinez-Pons, 1997; Wang, 2002), these findings are difficult to accurately interpret given the noted differences between these and ability-based measures of EI. Because of the ambiguity in interpreting this research, findings from studies using ability-based measures of EI are highlighted below.

Those high in EI are thought to understand, use, and manage emotions in adaptive ways that presumably confer a benefit to themselves and others (Salovey & Grewal, 2005). As such, EI has been shown to be related to better functioning within the workplace. For example, Kerr and colleagues (2006) found a moderate relationship between total EI scores and the performance of 38 managers as rated by over 1,000 of their employees. Total EI scores were also significantly related to ratings of managers' achievement of business outcomes and effective interpersonal behaviors in another study (Rosete, 2007). Thus, the ability to use, understand, and manage emotions effectively has been shown to be related to positive outcomes in a few studies.

Some recent studies have documented relationships between EI abilities and better psychological functioning. In one study, those high in total EI scores experienced significantly fewer and less intense psychiatric symptoms on the Symptom Checklist-90-Revised (SCL-90-R) than those low in EI (David, 2005). This relationship remained significant after controlling for Big Five personality traits. In another study, strategic EI (understanding and management) scores were significantly negatively related to illegal drug use and deviant behavior among young males (Brackett, Mayer, & Warner, 2004). Few studies have been published, however, on the relationship between EI abilities (as measured by the MSCEIT) and diagnoses of psychological disorders. In one study of EI—as measured by the MSCEIT—in a psychological disorder, Jacobs and colleagues (2008) found a significant negative relationship between total EI score and social anxiety severity among persons with generalized social phobia. Thus, EI abilities may serve a preventive function against psychopathology, though more research is needed to support this hypothesis.

Although overall EI abilities have not been measured in those with BD using the MSCEIT, researchers have long documented deficits in some facets of EI. In particular, there is substantial research in the area of emotion perception. For example, there are several studies examining facial affect recognition in those with BD. Researchers have found impairment in the labeling of pictures of facial affect expression in current mania (Getz, Shear, & Strakowski, 2003; Lembke & Ketter, 2002; McClure, Pope, Hoberman, Pine, & Leibenluft, 2003). Studies of those with BD when euthymic, however, have reported equivocal findings, with some showing deficits (McClure et al., 2003; Yurgelun-Todd et al., 2000) and others not (Addington & Addington, 1998; Jogia, Haldane, Cobb, Kumari, & Frangou, 2008; Venn et al., 2004). More specifically, studies have shown deficits in the recognition of fear and disgust in those with BD during periods of both euthymia (Yurgelun-Todd et al., 2000) and particularly strong deficits during mania (Lembke & Ketter, 2002). One recent study reported that persons with BD could accurately identify fear and disgust when euthymic, but that these participants had difficulty understanding the salience of these emotions (Malhi et al., 2007). That is, those with BD took longer to identify facial expressions of these emotions than healthy controls. Among adolescents with BD, both during mood episodes (hypomania or mania) and during euthymia, Rich and colleagues (2008) noted deficits in the recognition of facial affect (disgust, surprise, fear, happiness) compared to healthy controls. As mentioned above, researchers have also found deficits in the ability to use social cues to infer others' mental states (Theory of Mind [ToM]), among people with BD during euthymia (Bora et al., 2005; Olley et al., 2001). In sum, researchers have documented

deficits in emotion perception among those with BD. These deficits, however, are more pronounced during mood episodes, with inconsistent results during euthymia.

Given that at least some people with BD show deficits in emotion perception, a key question is whether these deficits are related to other meaningful outcomes. One interpretation of the above findings is that those with BD, particularly when manic, may experience difficulties in social interaction as a result of impairments in the recognition of negative affect in others (cf. Green, Cahill, & Malhi, 2007). The difficulty of those with BD to recognize disapproval from others may serve to impair relationship functioning. Indeed, this was found in a recent study of adolescents with BD, as parent reports of social reciprocity deficits in their child were significantly related to deficits in facial affect recognition (Rich et al., 2008).

An additional facet of EI, emotion regulation, has been widely researched in BD. Indeed, emotional instability is a key characteristic of the disorder (American Psychiatric Association, 2000). Some researchers have examined mechanisms that might help explain these problems with emotion regulation, including indicators of deficits in inhibitory control of emotion-related material. For example, those with BD have evinced slowed processing of depression-related words (Kerr, Scott, & Phillips, 2005; Lyon, Startup, & Bentall, 1999) and less activation in ventral prefrontal regions (Malhi, Lagopoulos, Sachdev, Ivanovski, & Shnier, 2005) compared to healthy controls during Emotion Stroop tasks. Researchers using the affective go/no-go task have shown that those with BD exhibit difficulties in inhibition of response to sad words while manic (Murphy et al., 1999). That is, while manic, those with BD made significantly more errors than both depressed and healthy control participants when presented with sad

words. Some have proposed that these deficits in inhibitory control may be associated with the difficulty regulating emotions witnessed in mania (Green, Cahill, & Malhi, 2007). Thus, problems with one facet of EI, emotion regulation, are one of the key characteristics of BD. In turn, researchers have examined mechanisms that may help explain these problems, including deficits in inhibitory control.

In sum, researchers have documented deficits in EF among those with BD as compared to healthy controls. In addition, these deficits have been shown to be related to difficulties in employment and clinician ratings of social and occupational functioning. More recently, deficits in one facet of social cognition, EI, have been identified in those with BD. That is, those with BD experience difficulties in emotional information processing, facial affect recognition, and emotion regulation. It may be that the relationship between EF deficits and poor QoL in those with BD may be partially explained by the negative effect EF deficits have on EI abilities. Indeed, this relationship has been proposed among those with schizophrenia (Sergi et al., 2007). More research is needed, however, to further understand the role of these impairments in the QoL of those with BD.

Overall Summary

There is extreme variability in the QoL of those with BD, with a significant portion functioning extremely well in social and occupational domains, despite a majority experiencing difficulty in these areas. Established correlates of QoL include illness characteristics (e.g., number of mood episodes, comorbidity) and demographic variables (e.g., educational attainment). More recently, researchers have examined the role of cognitive factors in the QoL of those with BD, including EF and social cognition. More

specifically, deficits in EF are associated with less employment and difficulties in social and occupational functioning as rated by clinicians. Deficits in emotional intelligence, a set of emotion-based, social-cognitive abilities, have been identified in those with BD. These deficits include difficulties perceiving emotions in others (e.g., facial affect recognition) and regulating emotions. A question yet to be addressed is whether these difficulties reflect underlying core deficits in those with BD, or if the variance in these difficulties can be fully explained by broader cognitive deficits (e.g., EF). In addition, the relationship between deficits in emotional intelligence and QoL is yet to be studied in BD. Researchers have provided early evidence that emotional intelligence is related to QoL among persons who are not diagnosed with BD. There is reason to suspect that this construct will be particularly important among those struggling with BD, a disorder defined by disabling mood instability. The ability to understand and regulate emotion in the face of this disorder, then, may be a particularly critical skill for protecting one's lifestyle during recurrent and difficult mood episodes.

Hypotheses of the Current Study

Hypotheses for the current study are as follows: 1) a significant portion of the variance in QoL (both subjective and objective indicators) among persons with BD will be explained by ability-based emotional intelligence, above and beyond the variance explained by symptom history (number of episodes of mania and depression), intelligence, educational attainment, and executive function; 2) the relationship between executive function and QoL will be mediated by ability-based emotional intelligence.

CHAPTER 2: METHOD

Participants and Procedures

Before recruiting participants, all aspects of the study were approved by the University of Miami's Institutional Review Board. Participants for the current study were recruited primarily through public advertising, but also through support groups and consumer organizations. Criteria for inclusion included the following: age between 18 and 65, sufficient fluency in English to complete the measures, and a diagnosis of BD using the Structured Clinical Interview for DSM-IV (SCID; First, Spitzer, Gibbon, & Williams, 1996). Exclusion criteria included the following: organic brain disorder, the inability to complete self-report measures independently, and scores on the interview-administered mania and depression scales indicating a current manic or depressive episode (i.e., scores greater than 16 on the Bech-Rafaelson Mania Scale [MAS] and 17 on the Modified Hamilton Rating Scale for Depression [MHRSD], see Johnson, Winett, Meyer, Greenhouse, & Miller, 1999). The latter criterion is included because it is important to understand whether EI deficits are stable traits among some with BD, not simply by-products of extremes in mood, though it is important to note that subsyndromal symptoms of mania and depression are the rule rather than the exception in BD (Judd et al., 2002)

All interested potential participants were asked to complete written informed consent procedures. Then diagnostic and symptom rating interviews were administered to determine study eligibility. Diagnostic interviews were conducted by graduate students trained and supervised by a clinical psychologist. For participants who met study entrance criteria, cognitive and self-report measures were completed. All

procedures were completed in one one- to two-hour session. Participants were remunerated for their time in the laboratory.

The total sample consisted of 42 persons from the South Florida ($n = 29$) and Northern California ($n = 13$) areas (67% female; mean age = 41 years; 21% Hispanic). Participants' mean years of education were 14.82, their mean NPB occupational prestige score was 46.62, and their mean family income was $38,688.39. Table 1 presents sample characteristics, and Table 2 presents the means and standard deviations of the other variables of interest.

Measures

Diagnostic and symptom measures. Diagnostic measures were used to determine study eligibility and to document history of mood episodes. Symptom measures were used to assess current mood state and are included as covariates in secondary analyses.

Structured Clinical Interview for DSM-IV (SCID; First, Spitzer, Gibbon, & Williams, 1996). Diagnoses were assessed using the depression, mania, substance abuse and dependence, and psychosis disorders modules of the SCID, a widely used interview designed to assess psychiatric diagnosis (Spitzer, Williams, Gibbon, & First, 1992). The SCID also includes questions regarding age of onset, number of episodes experienced, and age of last episode for all diagnoses. Interrater reliability of the SCID is high for diagnosing bipolar I disorder ($k = .84$; Williams et al., 1992).   For our team, interrater reliability, as assessed using random-model SEM of five interviews, was adequate.

Modified Hamilton Rating Scale for Depression (MHRSD; Miller, Bishop,

Norman, & Maddever, 1985). The MHRSD is a 17-item interviewer-administered scale

designed to assess symptoms of current depression. This modified version correlates

highly with the original HRSD (r = .84), and high interrater reliability has been observed

(interclass correlation = .93; Johnson, Winett, Meyer, Greenhouse, & Miller, 1999). The

scale's validity has been supported as it consistently identifies bipolar depression in

concert with diagnoses of current depression identified by the SCID (Johnson, Meyer,

Winett, & Small, 2000; Miller, Uebelacker, Keitner, Ryan, & Solomon, 2004).

Interviewer reliability on our team, assessed via intraclass correlation, was .93.

Bech-Rafaelson Mania Scale (MAS; Bech, Bolwig, Kramp, & Rafaelsen, 1979).

The MAS was used to assess symptoms of current mania among the participants in the

current study. Standardized probes and anchors have been developed by our research

team to rate each of the 11 items of the MAS on a scale of 0 (not present) to 4 (severe).

The scale is widely used to assess manic symptoms and has demonstrated high interrater

reliability (interclass correlation = .92; Johnson, Winett, Meyer, Greenhouse, & Miller,

1999). In addition, the MAS has demonstrated high sensitivity to small changes in

symptoms over time (Bech, 2002). Johnson and Miller (1997) performed a factor

analysis of the MAS and MHRSD and showed that the two scales represented one mania

factor and one depression factor, respectively. The intraclass correlation for interviewer

ratings was .84 in the current study.

Cognition measures. Cognition measures included a general measure of

intellectual ability (the Shipley Institute of Living Scale, vocabulary subtest), an indicator

of executive function (The Trail Making Test – Part B), and a battery of emotional

intelligence measures (Mayer-Salovey-Caruso Emotional Intelligence Test and the Assessing Emotions Scale). These measures were examined as correlates of QoL in the current study.

Shipley Institute of Living Scale (SILS; Shipley, 1940). The Vocabulary subtest of the SILS is one of the most widely used indices of verbal intelligence (for a review, see Zachary, Paulson, & Gorsuch, 1985). It has been shown in numerous studies to be robustly correlated with total Wechsler Adult Intelligence Scale (WAIS) scores. This subtest consists of 40 multiple-choice questions in which a target word is presented and the respondent is asked to choose which of four words is closest in meaning to that word. The verbal skills assessed by the Vocabulary subtest include acquired knowledge, reading ability, verbal comprehension, long-term memory, and concept formation. In the initial scale development study, Shipley (1940) obtained a reliability coefficient of .87. In addition, the SILS has shown high test-retest reliability over 45 days ($\alpha = .80$; Martin, Blair, Stokes, & Lester, 1977). The SILS as a measure of general intellectual ability was used as a correlate of QoL in the current study. The mean and standard deviation of scores in the current sample were comparable to those found in previous research (e.g., McCabe, Roediger, McDaniel, Balota, & Hambrick, 2010).

Trail Making Test (TMT; Reitan, 1958). The TMT was originally designed as an intelligence screening test as part of the Army Individual Test Battery (1944). Several neuropsychological test batteries, including the Halstead-Reitan Battery (Reitan, & Wolfson, 1993), the Multicenter AIDS Cohort Study Battery (Selnes et al., 1991), and the Individual Neuropsychological Testing for Neurotoxicity (Singer, 1990), include the TMT, and it is now widely used as a screening measure of EF (Lezak, 1995). Thus, the

TMT was included in the current study as a measure of EF and examined as a correlate of QoL.

The TMT is administered in two sections: part A (TMT-A), which involves drawing a line connecting consecutive numbers from 1 to 25, and part B (TMT-B), which involves drawing a line that connects alternating numbers and letters in sequence (i.e., 1-A-2-B-3-C, etc.). The time to complete each part is recorded. Examiners point out any errors as they occur, and the time it takes to correct these errors is included in the time to complete each part (Reitan & Wolfson, 1993). TMT-A is intended to measure processing speed, while TMT-B measures EF. More specifically, TMT-B is thought to measure inhibition, or the ability to suppress a habitual response, and set-shifting, the ability to quickly switch response based on rules (Burgess, Alderman, Evans, Emslie, & Wilson, 1998). Thus, although both parts were administered in this study, part B was used as an indicator of EF in all analyses.

Acceptable reliability and validity estimates have been obtained in several studies (e.g., Arbuthnott & Frank, 2000; O' Donnell, MacGregor, Dabrowski, Oestreicher, & Romero, 1994), and the TMT has been normed across a variety of cultural contexts (e.g., Giovagnoli et al., 1996; Nielsen, Knudsen, & Daugbjerg, 1989). A recent meta-analysis compared cognitive test performances of euthymic persons with BD and their first-degree relatives to normal controls (Arts, Jabben, Krabbendam, & van Os, 2007). In the 10 studies comparing those with BD to normal controls, the TMT-B differentiated the two groups by an average effect size of .99 (95% $CI = .51 – 1.48$). In the seven studies comparing first-degree relatives of those with BD to normal controls, the TMT-B differentiated the two groups by an average effect size of .37 (95% $CI = .15 - .60$). The

TMT-B has also been shown to be correlated with insight and self-reported QoL in euthymic BD (Dias, Brissos, Frey, Kapczinski, 2008). In light of the above findings, the TMT has been considered as a measure of cognitive endophenotype of BD (Bora, Yucel, & Pantelis, 2009).

Mayer-Salovey-Caruso Emotional Intelligence Test V2.0 (MSCEIT; Mayer, Salovey, & Caruso, 2002). The MSCEIT consists of 141 items within eight subtests, two subtests for each of the four domains inherent in the Four-Branch model of EI (Mayer & Salovey, 1997). In this model, perceiving, using, understanding, and managing emotions are considered skills that make up one's overall level of EI. The MSCEIT is completed by computer over the internet and takes approximately 30 minutes to complete. Responses are scored by the test publisher using correct answers derived from expert consensus (Mayer Salovey, Caruso, & Sitarenios, 2003).

The Perceiving Emotions and Using Emotions subtests comprise the Experiential EI scale, while the Understanding Emotions and Managing Emotions subtests comprise the Strategic EI scale. The authors created these subtests based on their theoretical model of EI, but support for their combination has been provided by recent factory analytic research (Roberts et al., 2006). The Perceiving Emotions subtest is comprised of the Faces and Pictures subtests that measure the ability to perceive and appraise emotions (anger, sadness, happiness, disgust, fear, surprise, and excitement) in faces and designs (pictures of colors and shapes that convey emotion). Respondents identify the emotions expressed in pictures of human faces. They also identify the intensity of these emotions on a scale of 1 (none) to 5 (very much). The Sensations and Facilitation subtests comprise the Using Emotions subtests. For the Sensations task, respondents are asked to

compare and contrast different emotions to sensations (e.g., color, temperature, light, etc.). For the Facilitation task, respondents rate the extent to which specific emotions may facilitate one's behavior or performance in specific situations on a scale of 1 (not useful) to 5 (useful). For example, a question might ask the following: "What mood(s) might be helpful to feel when meeting in-laws for the very first time?" The respondent would then be provided with the following moods: "slight tension," "surprise," and "joy."

The Blends and Changes subtests comprise the Understanding Emotions subtest. On the Blends subtest, respondents choose which emotions result from the combination of several emotions. For example, a respondent would be asked the following: "Tom felt anxious, and became a bit stressed when he thought about all the work he needed to do. When his supervisor brought him an additional project, he felt ____." A respondent then chooses from a list of possible emotions. On the Changes subtest, respondents identify how emotions change over time. This subtest might include a question such as the following: "If Jane is feeling irritated by her co-worker, how might she feel if her co-worker continues to bother her?" The respondent would then identify which emotion would result from that situation (e.g., rage). The Blends and Changes subtests are in multiple-choice format. Lastly, the Emotion Management and Social Management subtests comprise the Managing Emotions subtest. These subtests involve the presentation of social situations (e.g., "Debbie just came back from vacation feeling peaceful. How well would each action preserve her mood?") and the respondents select how appropriate (from 1 "very ineffective" to 5 "very effective") a given response is to achieve desired outcomes.

Mayer and colleagues (2002) obtained split-half reliabilities of .79 to .91 for the four subtests and .91 for Overall EI. Brackett and Mayer (2003) reported a three-week test-retest reliability coefficient of .86 for Overall EI. In terms of validity, the Understanding emotions subscale of the MSCEIT has been found to be significantly positively correlated with academic success (Lyons & Schneider, 2005; Zeidner, Shani-Zinovich, Matthews, & Roberts, 2005); the total score has been shown to be significantly positively correlated with psychological well-being (Brackett and Mayer, 2003; David, 2005) and significantly negatively correlated with substance use (Brackett, Mayer, & Warner, 2004).

MSCEIT subscale reliabilities obtained in the current study are presented in Table 2, and correlations among the subscales and total score are presented in Table 4. In a recent factor analysis of the MSCEIT, Rossen and colleagues (2008) suggest the Overall EI score may provide the most useful information as a general factor model fit the data best.

Assessing Emotions Scale (AES; Schutte et al., 1998). The AES is a self-report scale designed to assess the original components of Salovey and Mayer's (1990) theory of EI—the characteristic abilities to identify, understand, harness, and regulate emotions in oneself and others. The 33 items of the scale measure the degree to which participants agree or disagree with a particular statement on a scale of 1 to 5. Examples of items include the following: "Other people find it easy to confide in me"; "I am aware of my emotions as I experience them"; "It is difficult for me to understand why people feel the way they do" (reverse scored). In the development and validation study, Schutte and colleagues (1998) established good internal consistency and test-retest reliability. The

authors' validation studies showed that AES scores correlated negatively with alexithymia and positively with self-report measures of attention to and clarity of feelings, optimism, mood repair, openness to experience, and impulse control. Scores also significantly predicted academic grades among college freshmen, but were unrelated to cognitive ability. In more recent studies, the AES has been shown to be positively related to SWB (Carmeli, Yitzhak-Halevy, & Weisberg, 2009; Gallagher & Vella-Brodrick, 2008) and physical health (Schutte, Malouff, Thorsteinsson, Bhullar, & Rooke, 2007), and negatively related to psychopathology (Bauld & Brown, 2009; Gardner & Qualter, 2009).

Socio-economic status and demographics. A set of demographic variables were used as indicators of QoL. Yearly income in dollars was obtained. Occupational status was assigned a score based on the Nam-Powers-Boyd (NPB) occupational scores for the 2000 census (Nam & Boyd, 2004). These scores were calculated by the authors as follows: they 1) listed the occupations in the labor force according to the median educational level of the individuals; 2) separated the occupations according to the individuals' median level of income; 3) determined the cumulative interval of individuals in each occupation for each of the two lists using the number of individuals in each occupation, starting with the lowest-ranked occupation; 4) and calculated the average of the midpoints of the cumulative intervals of occupants and divided by the total number of individuals in all occupations. The resulting scores are interpreted as the approximate percentage of individuals in the labor force who are in occupations having combined levels of education and income lower than the given occupation (e.g., a psychologist is

assigned a score of 93, indicating approximately 93% of the labor force are in occupations having combined levels of education and income lower than a psychologist).

Employment status and stability were assessed in the current study. Employment stability, measured as the number of consecutive months employed at one's current job, was only included for descriptive purposes, given the fact that nearly half of the sample was not currently employed. Hollingshead Index of Social Position ratings were also obtained but excluded from analyses, as they 1) included employment categories that were outdated and difficult to assign jobs in the current sample to, and 2) did not provide additional information above and beyond the NPB prestige ratings.

Respondents were also asked to indicate the degree to which they felt the following about a confidant—a person in whom they felt they could confide (e.g., close friend, family member, spouse, etc.)—on a scale of 1 (marked) to 4 (little or none): 1) they are able to talk to them about anything, no matter how personal or embarrassing; 2) the confidant offers sympathy, understanding, advice, and encouragement; 3) the confidant offers practical help; 4) the confidant is critical or rejecting. The respondent was then asked to report the number of days in the last month they had spoken with the confidant. These two ratings were summed to provide an overall level of confidant support. Marital status and relationship stability were assessed in the current study but only used as descriptive statistics of the sample. These variables were not included in analyses because of the number of participants who were not in a current relationship.

Subjective well-being

World Health Organization Quality of Life – Brief Form (WHOQOL-BREF; Harper & Power, 1998). The WHOQOL is a self-report measure designed to encompass

the physical, emotional, social, and spiritual aspects of subjective well-being. The current study used the 26-item version WHOQOL–BREF for its brevity and established validity among people with BD (e.g., Dias, Brissos, Frey, & Kapczinski, 2008). The WHOQOL–BREF addresses four QoL domains (physical, psychological, social relationships, and environment) and asks the person to rate the extent to which they have experienced what is described in each item in the last four weeks. The physical domain subtest includes questions related to activities, treatment compliance, sleep, energy, pain and fatigue. An example question from the physical domain includes "Do you have enough energy for everyday life?" The psychological domain assesses positive and negative affect, self-esteem, physical appearance, beliefs/values, and attention. An example question includes "Are you able to accept your bodily appearance?" The social relationship domain is designed to assess personal relationships, social support, and sexual activity. An example question from this domain includes "How satisfied are you with your personal relationships?" Finally, the environment domain asks questions related to safety, finances, physical health, opportunities for learning, and recreation. An example question from the environment domain includes "How satisfied are you with the conditions of your living space?" Higher scores indicate higher QoL for each domain, and total scores can be calculated by summing all domains.

The WHOQOL group created the WHOQOL-BREF to develop a more user-friendly measure of QoL that could be applied cross-culturally. In their initial development and validation study, the group administered the measure to thousands of participants over 15 countries around the world. Domain scores of the WHOQOL-BREF correlated highly (.89 or above) with the original WHOQOL-100 domain scores. In

addition, the test-retest reliabilities were all adequate: .66 for physical health, .72 for psychological, .76 for social relationships and .87 for environment. The authors also conducted a confirmatory factor analysis of the four domains and found good fit for the four-factor model.

The WHOQOL-BREF has been used in several studies to assess the QoL of those with BD. In most studies, WHOQOL-BREF scores are lower among those with BD compared to the general population (e.g., Akvardar et al., 2006; Goossens, Hartong, Knoppert-van der Klein, & van Achterberg, 2008). In addition, lower scores on the physical and environmental domains have been shown to be related to poorer insight (Dias, Brissos, Frey, & Kapczinski, 2008) and adverse effects of medication (Yen et al., 2008) in those with BD. Reliability estimates of the WHOQOL-BREF are presented in Table 2, and correlations among the subscales and total score are presented in Table 3.

CHAPTER 3: RESULTS

The SPSS software program (version 14.0) was used in all data analyses. Before conducting analyses, I examined univariate distributions of the variables of interest for normality. Among the demographic variables, age, years of education, NPB occupational prestige scores, and confidant ratings were normally distributed. Family income was positively skewed. I completed a square root transformation on family income to normalize the distribution. The remaining variables of interest were normally distributed.

I then examined the major variables of interest for multivariate outliers using the Cook's D (distance) statistic (Cook, 1977). Cook's D is a measure of the change in overall parameter estimates when a given case's multivariate parameter is deleted. A case's parameter is considered an outlier if its Cook's D statistic is greater than $4/N$ (.095 in the current study; UCLA, 2010). I separately regressed the three primary outcomes (SWB, social functioning, and occupational functioning) on the proposed predictors of interest (see regressions below). This analysis identified several cases considered to be multivariate outliers in their respective predictors-outcome relations. With SWB as the outcome, three cases had Cook's D statistics above the cutoff. Upon examination of these cases, one had a substantially low MSCEIT Total score in relation to the other variables, another had a substantially high current depression score in relation to the other variables, and the third had a substantially high SWB score in relation to the other variables. With confidant ratings as the outcome, two cases were above the Cook's D cutoff. Both of these cases had confidant ratings substantially low in relation to the other variables. Lastly, two cases were considered multivariate outliers when occupational functioning was the outcome. One of the cases was the same case above with

substantially high levels of current depression in relation to the other variables, and the other case had an occupational prestige rating substantially low in relation to the other variables. Thus, these multivariate outlier cases were removed from their respective regression analyses below.

Preliminary Analyses

Correlates of subjective well-being. Bivariate correlations between SWB (as measured by the WHOQOL-BREF) and all other measures of interest are presented in Table 3. In regard to SWB, none of the demographic, cognitive, or functioning variables were significantly correlated with SWB, though there were some trends (see Table 3). Of the clinical variables, only current symptoms of depression were significantly (negatively) related to overall SWB. Self-reported emotional intelligence, as measured by the AES, was robustly positively correlated with overall SWB and its various constituents. On the other hand, ability-based emotional intelligence, as assessed by the MSCEIT, was largely unrelated to SWB. The Using and Experiencing scales of the MSCEIT were significantly positively related to only the Environmental health subscale of the WHOQOL-BREF.

Correlates of emotional intelligence. Table 4 shows the bivariate correlations between the MSCEIT scale scores and the various other measures of interest. The Understanding Emotions scale was significantly positively related to years of education, executive function, and general intelligence. The Emotional Reasoning scale was related to occupational prestige scores, general intelligence, executive function, and years of education. The Managing Emotions scale was related to occupational prestige scores and

to job stability. Lastly, the MSCEIT Total scale was significantly related to general intelligence.

Models of the role of emotional intelligence in the QoL of individuals with BD. As presented above, previous literature on the quality of life of individuals with BD has shown consistent relations between QoL and the following variables: illness history (i.e., number of episodes of depression and mania), current symptoms of depression and mania, general intelligence, years of education, and executive function. Based on this literature, I created three parallel hierarchical regression models of the three primary domains of QoL (SWB, social functioning and occupational functioning) as separate criterion variables.[1] Each of the above predictors was entered as an independent variable in block 1. To determine whether emotional intelligence added any significant variance in QoL above and beyond these predictors, I added the two measures of emotional intelligence in block 2. These regression models are presented in Tables 5 (for SWB), 6 (for social functioning), and 7 (for occupational functioning).

As can be seen in Table 5, current symptoms of depression (MHRSD scores) significantly negatively predicted SWB after controlling for number of episodes of depression and mania, current symptoms of mania (MAS), general intelligence (SILS), executive function (TMT-B), years of education, and the measures of emotional intelligence (MSCEIT and AES). There was also a nonsignificant tendency for number of previous manic episodes predicting lower SWB ($p = .07$), after controlling for the remaining variables. In Block 2, MSCEIT Total scores were not predictive of SWB after controlling for the other variables. Self-reported emotional intelligence as measured by the AES, however, did significantly predict SWB. In regard to social functioning (Table

6), self-reported emotional intelligence also predicted confidant ratings. Lastly, the only variable that significantly positively predicted occupational functioning (as measured by the NPB occupational prestige score) after controlling for the other predictors was years of education (see Table 7).

Secondary Analyses

I proposed to test the role of emotional intelligence as mediator of the relationship between executive function and QoL, based on the idea that the relationship between deficits in executive function and poor QoL in those with BD was at least partially explained by the negative effect that deficits in executive function have on emotional intelligence (as has been shown in individuals with schizophrenia; see Sergi et al., 2007). To conduct this analysis, Baron and Kenny's (1986) criteria must be met. First, the relation between executive function and QoL must be significant. Second, the relation between emotional intelligence and QoL must be significant. As neither of these relations was significant in the current study (see Table 3), the proposed mediational model was not examined further.

As a post-hoc analysis, I examined the role of emotion regulation (as measured by the MSCEIT Emotion Management subscale) in the above regression models. I did this because there was a theoretical reason to believe that the ability to regulate emotions— apart from other abilities of emotional intelligence—may help individuals with BD better navigate their social world, and thus relate to better quality of life. Emotion Management failed to predict QoL in these analyses.

CHAPTER 4: DISCUSSION

In the current study I examined the role of emotional intelligence in the subjective well-being, social functioning, and occupational functioning of 42 participants diagnosed with bipolar I disorder. I hypothesized that a significant portion of the variance in quality of life (both subjective and objective indicators) would be explained by ability-based emotional intelligence. I examined this relation while considering the variance explained by illness history (number of episodes of mania and depression) and current symptoms, general intelligence, educational attainment, and executive function. I also hypothesized that the relationship between executive function and quality of life would be mediated by ability-based emotional intelligence.

Hypothesis 1 was not supported, as ability-based emotional intelligence failed to predict significantly better subjective well-being and social functioning, above and beyond that explained by the other predictors. Self-reported emotional intelligence, however, did predict subjective well-being and social functioning. The only significant predictor of occupational functioning was educational attainment. Hypothesis 2 was not supported, in that neither executive function nor ability-based emotional intelligence significantly predicted quality of life. In this section I will discuss these findings in light of issues surrounding measurement, construct validity, and sample characteristics.

Measurement, Construct Validity, and Sample Characteristics

Although one may believe a potential reason for the lack of findings in the current study may have been related to a lack of sufficient power, this is unlikely the case. Before collecting data, I conducted a power analysis using the free software program G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) to determine the sample size needed

to detect a significant proportion of variance explained with 80% power. According to this program, 42 participants were required to detect a significant portion of incremental variance at an alpha level of .05 (small effect size [f^2] of .02). Some of the findings were in the expected direction. Subjective well-being, however, was nonsignificantly correlated with MSCEIT total scores at $r = .20$, still a small relation. Regression models indicated negligible relations between the MSCEIT and any of the quality of life indicators, so the possibility that larger samples would have resulted in different findings is unlikely.

Quality of life. As discussed in the introduction, quality of life is a broad construct encompassing myriad factors related to an individual's overall level of functioning and adaptation to their environment. In an attempt to capture the breadth of this construct, quality of life was measured across three pertinent domains: subjective well-being, social functioning, and occupational functioning. Subjective well-being was assessed via the World Health Organization's well-validated self-report measure of quality of life. Social functioning was measured via ratings of confidant support. Lastly, occupational functioning was measured via standardized ratings of occupational prestige. Given that neither executive function nor ability-based measures of emotional intelligence predicted measures of quality of life, it is important to consider potential problems in measurement of this construct.

In terms of psychometric properties, the WHOQOL-BREF performed adequately. That is, there was sufficient variability in responses and all scales demonstrated strong reliability. It was puzzling, then, to see a general lack of relations between total scores and the other measures of interest. In fact, among the over two dozen correlations with

WHOQOL-BREF examined in the current study, total scores were significantly correlated only with self-reported emotional intelligence and current symptoms of depression (negatively). This finding was surprising because several other variables in the current study have been found to be related to the WHOQOL-BREF total scores in previous research, including educational attainment (Ohaeri, Awadalla, & Gado, 2009), general intelligence (Hofer et al., 2009), and executive function (Brissos, Dias, Carita, & Martinez-Arán, 2008).

One potential explanation for the lack of findings is that the total score of the WHOQOL-BREF was an inappropriate indicator of subjective well-being, and perhaps subscales should have been examined separately in regressions. The overall pattern of relations of the WHOQOL-BREF subscales with other variables of interest, however, mirrored findings with the total score—namely, no relations. The one exception to this pattern was that the Environmental health subscale was significantly correlated with two of the MSCEIT subscales (Using and Experiencing emotions). There is no reason I can think of, however, that would explain why the Environmental health scale would be more related to these emotional abilities. Lastly, I wanted to understand what factors contributed to one's overall level of subjective well-being rather than contributors to specific facets. Thus, at least for the current study, the total score was an appropriate indicator.

Ratings of confidant support were used as indicators of social functioning in the current study. It is possible that this was not the most appropriate indicator of social functioning. That is, ratings were undoubtedly influenced by one's perception of support, as opposed to objective indicators of this construct. There is, however, empirical

evidence for the idea that perceived confidant support is perhaps the most critical social

support variable influencing outcomes, and objective indicators are not always predictive

(see Barrera, 1986). Nonetheless, it is certainly plausible that one can function well in

social domains while at the same time lack sufficient perceived social support.

Interestingly, confidant ratings were unrelated to WHOQOL-BREF Social Relations

subscale scores. It is unclear why this was the case, given both scales appear to measure

one's overall satisfaction with social relationships. Unfortunately, the other potential

objective indicator of social functioning included in the current study (marital status) was

not appropriate for the sample, given the substantial number of participants identifying

themselves as single. More specifically, there was no reason to believe that single

participants were socially lower functioning. That is, single participants were

significantly younger than married participants. In addition, there were at least two

instances in which participants were in a same-sex relationship in which they claimed

they would have been married if it were legally viable to do so.

Occupational functioning was measured via occupational prestige ratings based

on standardized rankings of jobs included in the 2000 U.S. Census. These ratings

provided a measure of occupational functioning that assesses the degree to which

employed individuals perceive a given occupation as prestigious. Using this measure,

occupations that may be considered less prestigious based on salary alone (e.g.,

professor) are weighted as having more prestige by consensus. Although these ratings

have been used as valid indicators of functioning in previous research (Sutin, Costa,

Miech, & Eaton, 2009; Tennstedt et al., 2007), the occupation one holds may not be as

informative as how well they perform their duties within that occupation. Thus, a measure of work quality would have been helpful to include.

Lastly, one cannot ignore the influence of subjective perception on self-reported well-being. Especially relevant to this study are the effects of current symptoms on one's subjective well-being. That is, several studies have found symptoms to be the most important, if not the only, significant predictor of subjective well-being, even when participants are in remission (Dias, Brissos, Frey, & Kapczinski, 2008; Gazzalle et al., 2006). These studies, however, did not examine multivariate models that included the various predictors included in the current study. Thus, although I believed current symptoms would influence one's subjective well-being, I did not expect them to be the only significant predictor.

Executive Function. The Trail Making Test – Part B was used as an indicator of executive function in the current study. This measure was chosen because of its substantial use in previous research, its established validity, its ease of administration, and its purported ability to assess inhibition. Although the TMT-B has been shown to be related to better quality of life among individuals with bipolar disorder in previous research (e.g., Dias, Brissos, Frey, Kapczinski, 2008; Tabarés-Seisdedos et al., 2008), this relation was not found in the current study. Scores in the current sample were better than those found in previous studies. That is, the mean time to complete the test in the current study was just over 50 seconds, substantially faster than that found in previous research (e.g., Tabarés-Seisdedos et al., 2008). Thus, the sample in the current study may exhibit significantly better executive function abilities than those examined in previous studies. This finding may be partly due to the fact that the current sample was recruited via

advertisements and not from outpatient clinics, samples that may exhibit different neurocognitive profiles associated with course of illness (see Dixon, Kravariti, Frith, Murray, & Mcguire, 2004). Findings of an association between executive function and quality of life may be more robust in samples that include individuals with poorer neurocognitive functioning.

Emotional intelligence. Emotional intelligence was measured in two ways: by the AES, a self-report questionnaire, and by the MSCEIT, an ability-based assessment. As noted above, the AES, but not the MSCEIT, showed expected correlations with subjective well-being and social functioning. Further, the AES was unrelated to any of the MSCEIT subscales or total score in the current study.

Although the AES was significantly predictive of subjective well-being and social functioning, several limitations preclude the accurate interpretation of these findings. For one, because the AES is a self-report measure, scores only reflect one's subjective perception of how emotionally intelligent they may be. Second, demand characteristics (or, conversely, stereotype threat associated with having a mental illness) may contribute to one's reporting of their emotional intelligence. Finally, those who feel that their functioning is poor may evaluate their emotional intelligence more harshly. Thus, emotional intelligence as measured by the AES may not accurately reflect an individual's actual level of emotional intelligence.

In an attempt to avoid the ambiguity in interpretation associated with using a self-report measure of emotional intelligence alone, I included the MSCEIT as an ability-based assessment of the construct. The creators of the MSCEIT contend that emotional intelligence is a construct best assessed using an ability-based measure, as self-report

measures of the construct may assess different domains (e.g., general intelligence,

personality traits) and are subject to response bias (Salovey & Mayer, 1990).

Researchers have recently documented some psychometric limitations, including a lack

of consistent factor structure and low reliability of the subscales (Keele & Bell, 2008;

Rossen & Kranzler, 2008). In the current sample, however, split-half reliabilities of the

scales were adequate (total scale $r = .94$). What is more, scores were normally distributed

and appeared to measure a unitary construct, as subscales were highly inter-correlated.

Thus, although it would be helpful to examine the factor structure of the MSCEIT in a

sample of people with bipolar disorder, given the adequate psychometric properties in the

current study, the lack of relations between this measure and other variables is unlikely

due to measurement limitations.

It is also possible that the validity of the MSCEIT is questionable. Although the

MSCEIT was designed as an ability measure, the measurement of emotional intelligence

as an ability may not be appropriate (Petrides, 2009). Petrides has argued that the

MSCEIT primarily measures abstract semantic knowledge about emotions, rather than

emotional intelligence. Thus, the lack of relations between the MSCEIT and the other

variables of interest in the current study may provide further evidence for the potential

limitations of ability-based measures of emotional intelligence. In fact, the validity of the

MSCEIT has been questioned in several recent studies. Zeidner and Olnick-Shemesh

(2010), in a study of over 200 high school students, found no relations between MSCEIT

total scores and subjective well-being. In a recent study of individuals with

schizophrenia, MSCEIT total scores were uncorrelated with measures of work

productivity, family network relationships, social relationships, and social adjustment

(Kee et al., 2009). Thus, a potential reason for the lack of findings regarding the MSCEIT in the current study may be due to questionable construct validity.

Other factors that were not measured in the current study but have been found to influence the quality of life of individuals in the general population may be more central to these individuals when outside of mood episodes. For example, personality traits, such as neuroticism, extraversion, and conscientiousness, have all been shown to impact quality of life (for a review see Narud & Dahl, 2002). These personality factors may be the most crucial determinants of one's overall level of functioning when euthymic.

Lastly, one must consider the possibility that emotional intelligence may simply have negligible effects on the quality of life of individuals with bipolar disorder while in remission. Although there was no control group in the current study for direct comparison, mean scores and variability in responses on the MSCEIT were comparable to those obtained in previous research with nonclinical samples (Kee et al., 2009; Rossen & Kranzler, 2009; Zeidner & Olnick-Shemesh, 2010). This suggests that individuals with bipolar disorder may not be impaired in emotional abilities while in remission. If this is the case, the lack of relations between the MSCEIT and quality of life indices may suggest that emotional intelligence may only be predictive of quality of life during more extreme moods. That is, an important question is whether the relatively strong emotional intelligence scores might diminish as people develop more substantial symptoms. The preservation of emotional intelligence during symptomatic periods (or lack thereof) would be expected to be particularly important for outcomes. For example, perception of changes in mood may help one experiencing the onset of a manic episode take precautionary measures against spiraling into a full-blown episode. In addition, the

ability to read emotions in others may help one experiencing symptoms to use informative social cues to modify one's behavior accordingly. Higher emotional intelligence during mood episodes, then, may serve as a buffer against the most severe consequences of these episodes and thus contribute to a higher quality of life overall.

Summary

In sum, several factors associated with the measurement of the various constructs in the current study may have contributed to the overall lack of significant findings supporting the proposed hypotheses. Quality of life is a very broad construct, and I attempted to capture three primary factors contributing to its overall concept: subjective well-being, social functioning, and occupational functioning. A potential reason for the lack of findings concerning subjective well-being may be related to the effect of symptoms of depression. The lack of findings concerning executive function may have been related to the fact that the current sample did not evince deficits found in samples used in previous studies. Finally, ability-based emotional intelligence may lack validity, or this construct may simply be unrelated to the quality of life of individuals with bipolar disorder. Although self-reported emotional intelligence scores were significantly related to both subjective well-being and social functioning, the potential bidirectionality of these findings precludes definitive interpretation (i.e., higher subjective well-being could just as readily predict higher perceived emotional intelligence as the other way around). In line with previous research (see Petrides, 2009), it is possible that emotional intelligence cannot be assessed using currently available ability-based measures, such as the MSCEIT.

Future Directions

Findings of the current study suggest the need for a broader model examining the complex factors associated with quality of life in bipolar disorder. Although the current study included a comprehensive, multidimensional assessment of quality of life, each factor was assessed using only one primary measure. Future research could benefit from using more objective indicators of quality of life, and combining these measures to form more powerful latent constructs. Indeed, researchers have recently found discrete neurocognitive domains to differentially predict functional competence and performance in the real-world behavior of individuals with schizophrenia (Bowie et al., 2008). The authors suggest that separating competence and performance may provide a clearer picture on precise correlates of functioning. Along these lines, the current study may be improved upon by relating emotional intelligence indices to more specific social or occupational outcomes. For example, social functioning could be assessed via observation coding of participants in a social interaction paradigm.

In the future, researchers are encouraged to examine the role of emotional intelligence in the quality of life of individuals with bipolar disorder as these individuals encounter adversity associated with the illness. It remains possible that emotional intelligence will decline as people develop more substantial symptoms, and that the level of emotional intelligence during symptomatic periods will be a predictor of functional outcomes. To test the dynamical interactions between symptoms and emotional intelligence, it will be important to conduct longitudinal studies that conjointly measure emotional intelligence and symptoms over time, and to examine whether these more dynamical patterns help predict outcomes.

The current study was a novel examination of the role of emotional intelligence in the quality of life of individuals with bipolar disorder. The topic addressed is of significant importance given the decrements—even during periods of remission—in quality of life associated with this illness. Additional strengths of the current study include the broad array of measures employed and the use of a clinical sample. Ultimately, the current study provides further insight into the complexities associated with the quality of life of individuals with bipolar disorder. For one, symptoms of depression may significantly interfere with one's subjective well-being. Thus, even while in remission, individuals with bipolar disorder may benefit from interventions addressing subsyndromal symptoms. Second, it is possible that the employment difficulties experienced by those with bipolar disorder may be associated with disruptions in education due to debilitating episodes. Identifying factors that contribute to the quality of life of individuals with bipolar disorder is a complex task, but the current study contributes further to the burgeoning literature in this important area of research.

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Notes

[1]Curvilinear effects of the predictors on the various outcomes were also examined. This was done by squaring the predictors, entering them in to the regression models, and checking their coefficients for unique variance explained in the outcomes. No curvilinear effects were significant.

Table 1

Sample Characteristics

Marital Status

    Single   31.0%

    Cohabitating   9.5%

    Married   23.8%

    Divorced   23.8%

    Widowed   2.4%

    Separated   9.5%

Employment

    Full-time   35.7%

    Part-time   26.2%

    Student   7.1%

    Disability   19.0%

    Retired   4.8%

    Unemployed   7.1%

Race

    Native American/Alaskan Native   2.4%

    Asian American   7.1%

    Pacific Islander/

      Hawaiian   2.4%

    Black   7.1%

White	78.6%
Mean (*SD*, Range) number months	
employed in current or most recent job	44.95 (60.47, 0-240)
Mean (*SD*, Range) number months in	
current or most recent romantic relationship	80.17 (105.94, 0-396)
Mean (*SD*, Range) confidant rating score	13.71 (2.10, 7-16)
Mean (*SD*, Range) number of days	
spoken to confidant in the last month	21.83 (11.11, 0-30)
History of Major Depressive Disorder	85.7%
Mean Age at first MDE	18.34
Number of MDEs	
1-3	25.0%
4-6	19.4%
>6	55.6%
Number of Hospitalizations for MDE	
0	63.9%
1	16.7%
>1	19.4%
Mean Age at first Manic Episode	24.12
Number of Manic Episodes	
1-3	45.2%
4-6	14.3%
>6	40.5%

Number of Hospitalizations for Mania

0	57.1%
1	14.3%
>1	28.6%
Mean (*SD*, Range) MAS Score	5.36 (4.67, 0-15)
Mean (*SD*, Range) MHRSD Score	5.52 (4.42, 0-15)

MAS = Bech-Raefelson Mania Rating Scale; MDE = Major Depressive Episode;
MHRSD = Mofified Hamilton Rating Scale for Depression

Table 2

Means, Standard Deviations, and Reliabilities of the Self-Report and Ability Measures

Measure	*M*	*SD*	Reliability*
AES	119.45	15.52	.89
TMT-B	53.60	22.63	-
SILS	31.88	5.63	.87
WHOQOL-BREF			
Physical	25.05	4.39	.72
Psychological	19.60	3.69	.73
Social Relations	9.29	3.16	.81
Environment	27.24	5.75	.77
Total	87.90	14.05	.88
MSCEIT (Standard Scores)			
Perceiving Emotions	100.66	13.92	.92
Using Emotions	99.39	16.36	.85
Understanding Emotions	94.26	11.51	.69
Managing Emotions	96.91	10.57	.85
Emotional Experiencing	99.02	16.99	.94
Emotional Reasoning	95.55	9.23	.84
Total	96.66	14.10	.94

*Reliabilities are presented as alpha coefficients for the AES, SILS, and WHOQOL-BREF subscale scores, and as split-half reliabilities for the MSCEIT scores

AES = Self-Report Emotional Intelligence Test; MSCEIT = Mayer-Salovey-Caruso

Emotional Intelligence Test; SILS = Shipley Institute of Living Scale; TMT-B = Trail-

Making Test –

Part B; WHOQOL – BREF = World Health Organization Qualify of Life Brief form

Table 3

Bivariate Correlations between Measures of Interest and the WHOQOL-BREF

	Physical	Psychological	Social Relations	Environment	Total
Age	-.10	.14	-.12	-.18	-.09
Sex	-.14	-.17	.00	.24	.02
Years Education	.29†	.05	-.04	.05	.16
NPB Score	.29†	.07	-.23	-.07	.03
Family Income	.26	-.01	-.08	-.01	.06
Confidant Rating	-.29†	.01	.11	-.01	.23
SILS	.06	.02	.14	-.06	-.02
TMT-B	.05	.18	.09	.21	.16
MDD Age of Onset	-.17	.02	-.19	-.16	-.18
Number MDE	.08	.23	.13	-.02	.16
Hospitalizations					
For MDE	-.30†	.25	.08	-.04	.01

Number Manias	.20	.11	-.05	-.12	.07
Hospitalizations					
For Mania	.13	.33*	-.11	-.02	.11
Mania Age of Onset	.01	-.11	-.05	.06	-.02
MAS	-.32*	-.05	-.18	-.06	-.17
MHRSD	-.51**	-.16	-.17	-.21	-.38*
AES	.38*	.40**	.29†	.28†	.46**
MSCEIT					
Perceiving	.14	-.21	-.11	.13	.01
Using	.19	-.03	.13	.34*	.25
Understanding	.05	-.02	-.03	.07	.06
Managing	-.13	-.15	-.28†	.02	-.17
Experiencing	.26	-.11	.10	.35*	.24
Reasoning	-.03	-.09	-.18	.08	-.04
Total	.07	-.16	-.13	.16	.01
WHOQOL-BREF					

Physical	-	.37*	.28†	.47**	.74***
Psychological	-	-	.36*	.35*	.68***
Social Relations	-	-	-	.47**	.65***
Environment	-	-	-	-	.82***

*$p < .05$, **$p < .01$, ***$p < .001$, †$p < .10$

AES = Assessing Emotions Scale; MAS = Bech-Raefelson Mania Rating Scale; MDD = Major Depressive Disorder; MDE = Major

Depressive Episode; MHRSD = Modified Hamilton Rating Scale for Depression; MSCEIT = Mayer-Salovey-Caruso Emotional

Intelligence Test; NPB = Nam-Powers-Boyd occupational scores; SILS = Shipley Institute of Living Scale – Vocabulary; TMT-B =

Trail Making Test-B; WHOQOL-BREF = World Health Organization Quality of Life – Brief Form

Table 4

Bivariate Correlations between Measures of Interest and the MSCEIT

	Perceiving	Using	Understanding	Managing	Experiencing	Reasoning	Total
Age	-.01	-.12	.16	.07	-.06	.20	.02
Sex	.07	.26	.05	.11	.19	.13	.16
Years Education	.07	-.02	.45**	.15	.04	.42**	.19
NPB Score	.23	.05	.27	.35*	.09	.38*	.29†
Family Income	.14	-.09	.10	.02	-.03	.05	.09
Confidant Rating	-.03	-.09	-.25	.11	-.03	-.07	-.11
SILS	.12	.11	.60***	.29†	.02	.58***	.40**
TMT-B	-.15	.04	-.50**	-.20	.04	-.42**	-.30†
AES	-.09	.18	-.32*	.00	.09	-.22	-.09
Age First MDE	-.04	-.33†	.07	-.11	-.26	-.02	-.11
Hospitalizations							
For MDE	-.21	.21	-.03	-.11	.08	-.11	-.11

Number Manias	-.04	.19	-.06	.18	.18	.11	.03
Hospitalizations							
For Mania	-.12	-.10	-.30†	-.17	-.04	-.29†	-.26†
Age First Mania	.17	-.10	.20	-.03	-.01	.10	.11
MAS	-.12	-.02	-.11	.07	-.06	-.02	-.09
MHRSD	-.04	-.07	-.16	.19	-.11	.00	-.01
MSCEIT							
Perceiving	-	.48**	.42**	.33*	.84***	.43**	.79***
Using	-	-	.39*	.43**	.88***	.57***	.86***
Understanding	-	-	-	.24	.36*	.79***	.71***
Managing	-	-	-	-	.38*	.79***	.69***
Experiencing	-	-	-	-	-	.51**	.92***
Reasoning	-	-	-	-	-	-	.86***

*$p < .05$, **$p < .01$, ***$p < .001$, †$p < .10$

AES = Assessing Emotions Scale; MAS = Bech-Raefelson Mania Rating Scale; MDD = Major Depressive Disorder; MDE = Major

Depressive Episode; MHRSD = Modified Hamilton Rating Scale for Depression; MSCEIT = Mayer-Salovey-Caruso Emotional

Intelligence Test; NPB = Nam-Powers-Boyd occupational scores; SILS = Shipley Institute of Living Scale – Vocabulary; TMT-B =

Trail Making Test-B

Table 5

Hierarchical Multiple Regression Model of Subjective Well-Being[a]

Predictor	β	t	p	ΔR^2
(Constant)		0.95	.351	.17
Past Times Depressed	.19	1.54	.133	
Past Times Manic	-.26	-1.86	.073	
MAS	.05	0.32	.754	
MHRSD	-.44	-2.50	.018	
SILS	-.07	-0.35	.731	
TMT-B	.34	1.83	.078	
Years of Education	.25	1.39	.175	
MSCEIT Total	-.04	-0.27	.786	
AES	.48	3.37	.002	

*Coefficients of the final model are reported

[a] Criterion variable = WHOQOL-BREF Total

AES = Assessing Emotions Scale; MAS = Bech-Raefelson Mania Rating Scale; MHRSD = Modified Hamilton Rating Scale for Depression; MSCEIT = Mayer-Salovey-Caruso Emotional Intelligence Test; SILS = Shipley Institute of Living Scale; TMT-B = Trail Making Test – Part B; WHOQOL-BREF = World Health Organization Quality of Life scale – Brief version

Table 6

Hierarchical Multiple Regression Model of Social Functioning[a]

Predictor	β	t	p	ΔR^2
(Constant)		0.27	.791	.14
Past Times Depressed	-.25	-1.56	.130	
Past Times Manic	-.02	-0.12	.907	
MAS	.02	0.13	.896	
MHRSD	.33	1.78	.084	
SILS	.23	0.95	.350	
TMT-B	.00	-0.01	.991	
Years of Education	-.09	-0.39	.701	
MSCEIT Total	-.19	-1.09	.283	
AES	.38	2.22	.033	

*Coefficients of the final model are reported

[a] Criterion variable = Confidant ratings

AES = Assessing Emotions Scale; MAS = Bech-Raefelson Mania Rating Scale; MHRSD = Modified Hamilton Rating Scale for Depression; MSCEIT = Mayer-Salovey-Caruso Emotional Intelligence Test; SILS = Shipley Institute of Living Scale; TMT-B = Trail Making Test – Part B; WHOQOL-BREF = World Health Organization Quality of Life scale – Brief version

Table 7

Hierarchical Multiple Regression Model of Occupational Functioning[a]

Predictor	β	t	p	ΔR^2
(Constant)		-1.57	.126	.04
Past Times Depressed	-.02	-0.18	.860	
Past Times Manic	.05	0.33	.745	
MAS	-.18	-1.21	.237	
MHRSD	.11	0.61	.550	
SILS	.14	0.72	.480	
TMT-B	-.19	-1.03	.310	
Years of Education	.55	2.94	.006	
MSCEIT Total	.06	0.41	.683	
AES	.21	1.51	.141	

*Coefficients of the final model are reported

[a] Criterion variable = NPB

AES = Assessing Emotions Scale; MAS = Bech-Raefelson Mania Rating Scale; MHRSD = Modified Hamilton Rating Scale for Depression; MSCEIT = Mayer-Salovey-Caruso Emotional Intelligence Test; NPB = Nam-Powers-Boyd occupational prestige rating; SILS = Shipley Institute of Living Scale; TMT-B = Trail Making Test – Part B; WHOQOL-BREF = World Health Organization Quality of Life scale – Brief version