SELF-EFFICACY IN DEPRESSION: BRIDGING THE GAP BETWEEN COMPETENCE AND REAL-WORLD FUNCTIONING

by

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Abstract

**Background**: Depression is the largest contributing factor to years lost to disability, and symptom remission does not always result in functional improvement. Comprehensive analysis of functioning requires investigation both of the competence to perform behaviours, as well as actual performance in the real world. Further, two independent domains of functioning have been proposed: adaptive (behaviours conducive to daily living skills and independent functioning) and interpersonal (behaviours conducive to the successful initiation and maintenance of social relationships). To date, very little is known about the relationship between these constructs in depression, and the factors that may play a key role in the disparity between competence and real-world performance in adaptive and interpersonal functioning.

**Purpose**: This study used a multidimensional (adaptive and interpersonal functioning), multi-level (competence and performance) approach to explore the potential discrepancy between competence and real-world performance in depression, specifically investigating whether self-efficacy (one’s beliefs of their capability to perform particular actions) predicts depressed individuals’ underperformance in the real world relative to their ability. A comparison sample of healthy participants was included to investigate the level of depressed individuals’ impairment, across variables, relative to healthy individuals.

**Method**: Forty-two participants with depression and twenty healthy participants without history of, or current, psychiatric illness were recruited in the Kingston, Ontario community. Competence, self-efficacy, and real-world functioning all in both adaptive and interpersonal domains, and symptoms were assessed during a single-visit assessment.

**Results**: Relative to healthy individuals, depressed individuals showed significantly poorer adaptive and interpersonal competence, adaptive and interpersonal functioning, and significantly lower self-efficacy for adaptive and interpersonal behaviours. Self-efficacy significantly predicted functional disability both in the domain of adaptive and interpersonal functioning. Interpersonal self-efficacy accounted for significant variance in the discrepancy between interpersonal competence and functioning.
**Conclusions:** The current study provides the first data regarding relationships among competence, functioning, and self-efficacy in depression. Self-efficacy may play an important role in the deployment of functional skills in everyday life. This has implications for therapeutic interventions aimed at enhancing depressed individuals’ engagement in functional activities. There may be additional intrinsic or extrinsic factors that influence the relationships among competence and functioning in depression.
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# Table of Contents

Abstract ........................................................................................................................................ i
Acknowledgements ....................................................................................................................... iii
List of Tables ................................................................................................................................ vi
Chapter 1 Introduction .................................................................................................................. 1
  Depression: An Overview ........................................................................................................... 1
  Symptom Domains and Course of Illness ..................................................................................... 2
  Functional Impairment in Depression ......................................................................................... 3
  Established Predictors of Functional Disability in Depression .................................................. 4
  Depressive Symptoms and Comorbid Psychiatric Illness ........................................................... 4
  Cognition ..................................................................................................................................... 6
  Functional Disability: The Relationship Between Competence and Performance ..................... 7
  Competence ............................................................................................................................... 8
  Real-world Performance .............................................................................................................. 9
  The Relationship Between Competence and Performance ......................................................... 10
  Self-efficacy as a Bridge of Competence to Performance in Depression ..................................... 11
  The Current Study ...................................................................................................................... 13
  Hypotheses ............................................................................................................................... 14
Chapter 2 Methods ....................................................................................................................... 16
  Participants ............................................................................................................................... 16
  Measures .................................................................................................................................. 17
  Diagnostic Criteria .................................................................................................................... 17
  Symptoms .................................................................................................................................. 17
    Depression ............................................................................................................................... 17
    Anhedonia ............................................................................................................................... 18
    Social Anxiety ......................................................................................................................... 18
  Performance-based Measures of Functional Competence ......................................................... 18
    Adaptive Competence ............................................................................................................ 18
    Interpersonal Competence ....................................................................................................... 19
  Real-world Functional Disability ................................................................................................ 21
    Adaptive Performance ............................................................................................................ 21
    Interpersonal Performance ...................................................................................................... 21
  Measures of Self-efficacy .......................................................................................................... 22
List of Tables

Table 1. Psychotropic medications of depressed sample .......................................................... 25
Table 2. Descriptive characteristics of the overall sample and by group ..................................... 26
Table 3. Observed ranges, means, standard deviations, and ANCOVA group differences on measures used .......................................................................................................................... 30
Table 4. Two-tailed correlations between symptoms and competence, performance, and self-efficacy in the depression group .................................................................................................................. 33
Table 5. Two-tailed correlations among competence, performance, and self-efficacy in the depression group .................................................................................................................................................. 33
Table 6. Correlations between variables in the interpersonal domain hierarchical regression in the depression group ....................................................................................................................... 37
Table 7. Regression coefficients for interpersonal discrepancy regression models in the depression group .................................................................................................................................................. 37
Table 8. Regression coefficients for adaptive functioning regression models in the depression group ................................................................................................................................................ 38
Table 9. Regression coefficients for interpersonal functioning regression models in the depression group ................................................................................................................................................ 39
Chapter 1

Introduction

Depression: An Overview

Depression is characterized by feelings of sadness or emptiness and diminished interest or pleasure in activities. These experiences may be accompanied by feelings of low self-worth, guilt, impaired concentration, disturbances in sleep, and recurrent thoughts of death and suicide (American Psychiatric Association, 2013). Clinical depression is common, affecting 11.3% of Canadians over their lifetime and 4.7% of Canadians annually (Patten et al., 2015).

Depression is currently the leading cause of disability worldwide for both males and females in terms of total years lost to disability (Marcus, Yasamy, van Ommeren, Chisholm, & Saxena, 2012). Further, it has been projected that by 2030 depression will be the leading cause of disease burden in developed countries (World Health Organization, 2008). Problems of social dysfunction, decreased income resulting from workplace absenteeism, as well as underperformance or underemployment are a strain for the depressed individual and his or her family (Lepine & Briley, 2011). Further, depression places burden on the economy due to time missed from work or other occupational roles as well as increased cost of health services (Simon, 2003). The strain of depression extends beyond the disorder itself, influencing mortality risk of the patient. For example, prospective research has found an elevated risk for mortality in depressed individuals, especially from suicide and circulatory disorders in both men and women (Angst, Stassen, Clayton, & Angst, 2002).

As an illness that is both highly prevalent as well as associated with other mental and physical health problems, depression is a significant contributor to the global burden of disease, accounting for significant cost on society. For example, a large-scale community epidemiological survey of mental disorders in the United States found that diagnosis of Major Depressive Disorder (MDD) was associated with a 27 times greater likelihood of work loss than among workers without a mental disorder and that
44% of depressed workers reported missing one or more days of work for emotional problems in the prior 3 months (Kouzis & Eaton, 1994). The estimated annual costs attributable to clinical depression are approximately $83 billion, with indirect costs largely resulting from lessened psychosocial functioning (particularly workplace performance; Greenberg et al., 2003). Furthermore, depressive disorders are associated with a 50% - 75% increase in overall health service costs even after adjusting for comorbid chronic medical conditions (Simon, 2003).

**Symptom Domains and Course of Illness**

The symptoms of depression can be quite heterogeneous; however, the essential feature of a depressive episode is a period of at least two weeks during which there is depressed mood and/or the loss of interest and pleasure in nearly all activities (American Psychiatric Association, 2013). Depressed individuals may describe their mood as sad, hopeless, discouraged, and many report increased irritability. Lack of interest in activities previously found pleasurable may manifest in social withdrawal or neglect of pleasurable avocations. Individuals with depression may also experience an appetite change that involves an increase or reduction, and sleep disturbance taking the form of difficulty falling and staying asleep, or excessive sleep. These individuals may struggle to sit still, pacing and hand-wringing; or alternatively, experience slowed body movements and speech. Decreased energy and fatigue is very common in depression whereby the completion of task efficiency is reduced and simple tasks are seen as exhausting and requiring substantial effort. Further, an unrealistic negative evaluation of one’s worth or rumination over minor past failings can leave a depressed person excessively blaming his or herself for being sick and failing to meet occupational or interpersonal responsibilities. Difficulty in concentrating and making decisions is also typical, and these individuals may complain of memory difficulties. Lastly, thoughts of death, suicidal ideation, or suicide attempts are common, ranging from a passive wish to not awaken in the morning, to recurrent thoughts of committing suicide, to development of a specific suicide plan. Considerable symptom variability has been reported across individuals (Katschnig, Pakesch, & Egger-Zeidner, 1986; Lichtenberg & Belmaker, 2010) and within individuals across time (Oquendo et al., 2004).
The course of depression can be quite variable whereby some individuals rarely, if ever, experience remission (i.e., a period of two or more months with no symptoms, or only one or two symptoms to no more than a mild degree) and may have depressive episodes that increase in severity and frequency over time, while others may have isolated depressive episodes that are separated by years of euthymia (i.e., a non-depressed, generally positive mood) (American Psychiatric Association, 2013). Clinical depression is often associated with a high rate of recurrence and non-recovery, with chronicity rates estimated at approximately 20% (van Randenborgh et al., 2012).

**Functional Impairment in Depression**

As with other psychiatric disorders, diagnosis of depression is possible only when there is evidence of substantial interference with functioning. Indeed, depression is associated with significant functional impairment that results in reduced quality of life, worse psychosocial functioning, and a number of deficits in the workplace, the home, and interpersonal relations (e.g., Petty, Sachs-Ericsson, & Joiner, 2004; Bosc, 2000; Kessler & Frank, 1997). Cross-sectional survey evidence (Kessler et al., 2003) suggests that approximately 60% of depressed individuals report substantial (i.e., severe or very severe) impairment. Even at subsyndromal levels, depression has a significant effect on daily functioning and may cause particular challenge with psychosocial functioning (Judd, Paulus, Wells, & Rapaport, 1996).

Hays and colleagues (1995) have discovered that the long-lasting decrements in functioning for individuals with depression are of equal or greater extent than those caused by other common, chronic medical conditions such as diabetes, hypertension, heart attack, and congestive heart failure (Mathers & Loncar, 2006; Murray & Lopez, 1996). Further, Wells et al. (1998) reported worse social, physical, and role functioning in depressed patients compared to patients without any chronic condition. Taken together, the literature suggests that there is a tendency for functioning to be less responsive to treatment than symptoms (i.e., functional outcomes may lag behind symptom outcomes).

While most researchers and clinicians recognize the concern of functional disability in depression, severity of depression is almost exclusively expressed by phenomenological (i.e., symptom) assessments that do not fully address the effects of depression (McKnight & Kashdan, 2009), and
consequently, inadequate attention may be directed at improvements in real-world function. This is surprising given that functional disability in depression is associated with societal and economic problems, thereby creating a link between impairment and disorder for policy-makers and health care professionals. The wide assumption is that improvement in depressive symptoms during treatment leads to an improvement in quality of life and a decrease in disability (Papakostas et al., 2004); however, disability is only partially associated with depressive symptom severity. Standard pharmacological and psychological treatments target mood symptoms, but the mitigation of depressive symptoms is not always associated with functional improvement or recovery. In light of this, functional impairment in depression ought to be a prominent outcome for clinical and treatment investigations. Thus, in view of the debilitating impact of depression, there is need for research that will comprehensively assess the impact of depression on functioning and shift focus to the identification and understanding of added predictors of functional deficits, beyond diagnostic symptoms of depressive disorders. The human capital cost attributable to depression provides additional impetus to investigate and identify determinants of disabled functioning in this disorder.

Established Predictors of Functional Disability in Depression

Depressive Symptoms and Comorbid Psychiatric Illness

Depressive symptoms of individuals with depressive disorder are associated with limitations in multiple dimensions of patient well-being and functioning when compared with patients who have no chronic conditions. The functioning of depressed patients has been described as comparable to, or worse than, that of patients with a major chronic medical condition (Wells et al., 1998). A recent review found moderate correlations between depressive scores on various screening instruments and measures of impairment (McKnight & Kashdan, 2009).

Clinically, improvement in social functioning has been found to lag behind depression symptom change, persisting longer (for up to 4 years; Bothwell & Weissman, 1977) than depressive symptoms (Hirschfeld et al., 2000). With occupational functioning, as depressive symptoms increase, work
productivity is found to decrease further (Thompson & Richardson, 1999), independent of comorbid medical conditions (Adler et al., 2006). In the domain of physical functioning, Goodwin (2006) explains that as depressive symptoms increase, physical functioning deteriorates and vice versa, most likely attributable to the fact that depressive episodes are defined by three symptoms relevant to physical activity (i.e., diminished interest or pleasure in activities, psycho-motor agitation or retardation, and fatigue or loss of energy; McKnight & Kashdan, 2009). Therefore, as expected, a well-established predictor of functional impairment in depression is the presence and severity of depressive symptoms.

In addition to depressive symptomatology, psychiatric comorbidity is a clinical variable that has been shown to be a risk factor for functional impairment (Papakostas et al., 2004); however, when examined with comorbid symptoms, depressive symptomatology consistently explains the majority of the variance in functioning. For example, Gili et al. (2013) discovered that in depressed patients, variability in functional limitation (as assessed using the 12-item version of the self-administered World Health Organization Disability Assessment Schedule-II, a measure of an individual’s level of functioning in major life domains; Rehm et al., 1999; World Health Organization, 2000) was mostly attributable to depression severity (60%) and less so to comorbid anxiety (5%). Further, van der Werff and colleagues (2010) explored the combined influence of depression severity and a number of comorbid mental disorders (i.e., dysthymia, generalized anxiety disorder, panic disorder, social phobia, agoraphobia, and alcohol dependence) on disability in individuals with diagnosed MDD, as measured using the self-report full version of the World Health Organization Disability Assessment Schedule-II (World Health Organization, 2000), consisting of six domains of functioning (communication, mobility, self-care, getting along with others, life activities, and participation in society). While each comorbid diagnosis had a significant low-moderate correlation with functional disability (r-values from .12 to .25), when combined into a multivariate model, the effects of comorbid diagnosis fell below significance except for agoraphobia (3% of variance). Similar to the findings of Gili et al. (2013), depressive symptom severity was clearly the strongest predictor of functional disability (34% of variance). Although heterogeneity in
disability in persons with depression is partially explained by illness characteristics of depressive disorders, particularly symptom severity, a large proportion of the variance remains unaccounted for.

**Cognition**

Replicated evidence indicates that cognitive dysfunction both causes and maintains psychosocial impairment in severe mental disorders (Jaeger, Berns, Uzelac, & Davis-Conway, 2006; Conradi, Ormel, & de Jonge, 2010; Buist-Bouwman et al., 2008). In depression, available evidence proposes that cognitive dysfunction is a critical determinant of functional outcome (Buist-Bouwman et al., 2008). A common convention among extant research is the reporting and comparison of group means as opposed to emphasizing individuals who fall below a pre-specified cut score for cognitive impairment (e.g., 1-2 standard deviations [SD] below the norm; Gualtieri & Morgan, 2008). Notwithstanding, it is reported that approximately 25-50% of depressed patients exhibit deficits that are greater than 1 SD below the mean on at least one cognitive domain and as many as 48% score more than 2 SD below the mean (McIntyre et al., 2013; Gualtieri & Morgan, 2008).

McIntyre and colleagues (2013) report that cognitive deficits in MDD are replicable, consistent, clinically significant, and of small-to-medium effect size. The most replicated deficits have been observed in the cognitive domains of executive function, working memory, attention, and psychomotor speed (Lee, Hermens, Porter, & Redoblado-Hodge, 2012). Further, individuals who have remitted MDD have been shown to exhibit persistent cognitive deficits despite depressive symptom improvement. For example, Preiss et al. (2009) found patients in remission from MDD performed significantly worse than healthy individuals on tasks of working memory, executive function and attention.

It has been observed that cognitive deficits account for a significant percentage of variance with respect to the link between psychosocial dysfunction and depressive disorder (Buist-Bouwman et al., 2008; Gualtieri & Morgan, 2008; Birnbaum et al., 2010). For example, in a preliminary study investigating the relationship between objectively-measured cognitive deficit and self-rated disability in depressed individuals, the authors found that impaired cognition accounted for 16% of variance in disability (Naismith, Longley, Scott, & Hickie, 2007). Further, research has suggested that difficulty in
updating contents of, and removing irrelevant negative material in, one’s working memory is related to depressive symptoms experienced in MDD (Joorman & Gotlib, 2008). Due to well-established and replicated findings of cognitive impairment and their relationship to depression, recent investigations of cognitive remediation with those who experience depression have sought to improve functional outcomes through enhancing cognition in collaboration with real-world simulations and goal setting techniques (e.g., Bowie, Grossman, Gupta, Holshausen, & Best, 2016).

In spite of prior research investigating how symptomatology, comorbidity, and cognitive deficits relate to functional disability in depression, a large proportion of the variance in functional outcome remains unaccounted for, thereby making it difficult to comprehensively decipher why individuals with depression often fail to deploy functional skills in the real world. This fact provides the impetus to investigate other factors outside of those already explored that might help to explain this gap.

**Functional Disability: The Relationship Between Competence and Performance**

Two distinct domains of functioning tend to be impaired in depression: adaptive and interpersonal behaviour (Gili et al., 2013; Herrman et al., 2002). Adaptive behaviours are those that are conducive for everyday living and independent functioning (Mausbach et al., 2008), including self-care, recreation, vocation, and household maintenance. Interpersonal behaviours consist of the actions required for successful initiation and maintenance of social relationships (Meyer & Kurtz, 2009). Since functional impairments may persist even when patients are in remission from a major depressive episode (Greer, Kurian, & Trivedi, 2010; McKnight & Kashdan, 2009; Coryell et al., 1993), recovery from depression requires not only the treatment of depressive symptoms but also an improvement in the interaction of individuals with their social environment and their function in everyday life (Greer et al., 2010).

Recent advances in the assessment of disability in individuals with severe mental illness have separated the measurement of ability to perform everyday tasks from actual real-world outcomes (Harvey, Velligan, & Bellack, 2007). This separation provides a comprehensive understanding of functioning as a multidimensional construct, including consideration for both one’s competence (what one can do) to perform adaptive and interpersonal behaviours, as well as his or her performance (what one
actually does) in these domains in the real world. This enables a more precise set of predictors of outcome (Harvey et al., 2007).

Competence

The measurement of competence (also referred to as capacity) in mental illness provides assessment of the functional consequences of impairment related to the particular condition being considered (Patterson & Mausbach, 2010). Functional capacity can be measured by assessing an individual’s ability, under controlled conditions, to perform tasks and activities that are necessary or desirable for everyday functioning. By focusing on real-world assessment in a controlled laboratory setting, it is possible to establish an individual’s level of ability in the skills needed to function independently in the real world. These measures allow researchers and clinicians to assess the capacity of an individual to perform specific skills necessary for independent living (e.g., household management, communication, social, planning, and financial skills) by using props and role-play where appropriate.

While performance on a measure of functional competence does not inform whether participants are performing instrumental tasks in the real world, it identifies whether these individuals can perform them. Within the existing literature, functional capacity has not been a primary investigative target in depression. The University of California, San Diego Performance-Based Skills Assessment Battery (UPSA; Patterson, Goldman, McKibbin, Hughes, & Jeste, 2001a) is the most widely used measure of functional capacity in the U.S. (Mantovani, Teixeira, & Salgado, 2015), developed for use with individuals who have severe mental illness, primarily schizophrenia. On this measure healthy individuals score approximately 93% accuracy, while individuals with schizophrenia or schizoaffective disorder have accuracy scores ranging from 59 – 70% (Patterson et al., 2001a; Mausbach, Harvey, Goldman, Jeste, & Patterson, 2007). Scant research has been conducted using the UPSA in a unipolar depressed sample. To date it has been used in two separate investigations of depressed individuals. The resulting mean accuracy scores on the UPSA in these separate investigations were discrepant: Harvey et al. (2015) observed an average UPSA performance of 78% accuracy in their sample whereas McIntosh and colleagues’ (2011) sample of depressed individuals performed with a mean accuracy of 48%. These scant and discrepant
findings on the UPSA with depressed samples warrants further investigation of this measure in those with depression to determine its effectiveness in identifying functional consequence of this mental illness.

In the domain of interpersonal competence, a unique measure has been developed for the assessment of social skills in severe mental illness, primarily schizophrenia (Social Skills Performance Assessment; SSPA; Patterson, Moscona, McKibbin, Davidson, & Jeste, 2001b). On this assessment, individuals with schizophrenia have been shown to perform on average with 60% accuracy, whereas healthy individuals perform with 90% accuracy. Similar to the UPSA, scant research has employed the SSPA in a unipolar depressed sample. Gupta (2011) has used the SSPA in an investigation of individuals with treatment-resistant depression, whereby these individuals performed with 70% accuracy.

While unique measures have been developed to assess both adaptive and interpersonal competence, they have been primarily developed for severe mental illness, most often utilized in samples with schizophrenia. At this point, it is necessary to employ these measures in a sample of individuals with unipolar depression, to investigate their sensitivity and effectiveness in identifying impairment in depressed relative to healthy individuals.

**Real-world Performance**

Historically, everyday functioning measurements have focused on the endpoint of real-world performance, in an effort to classify level of disability on the basis of daily activities carried out incorrectly or not at all (Mantovani et al., 2015). Current assessments of everyday performance include scales to measure various areas of functioning (e.g., self-care, socially useful activities, handling finances, managing the household, and vocational performance). Real-world performance is assessed either through third party ratings of behaviour, direct observation, or self-report. While each has its benefits, self-report interviews have the virtue of being simplistic, economic in delivery time, and they integrate a person’s own perception of how well they are functioning (Patterson & Mausbach, 2010).

Prior investigations using functional disability scales have typically observed moderate to severe impairment in depressed patients. For example, using the Sheehan Disability Scale (Sheehan, Harnett-Sheehan, & Raj, 1996), a self-report functional impairment scale across the domains of work/school,
social/leisure activities, and family/home responsibilities, Sheehan et al. (2016) observed an average score of 20 (out of a maximum of 30), corresponding to moderate functional disability. In another study, Hirschfeld and colleagues (2002) observed substantial impairment in clinically depressed individuals’ overall psychosocial functioning as measured by the Social Adjustment Scale – Self-report (Weissman, Prusoff, Thompson, Harding, & Meyers, 1978) and the Medical Outcome Study 36-item Short Form – Social Functioning subscale (Ware & Sherbourne, 1992). On these two measures, depressed individuals performed at 2.4 and 1.8 standard deviations below the mean of a healthy community sample, respectively (Hirschfeld et al., 2002). These participants were also rated “poor” or “very poor” on the social adjustment scale of the Longitudinal Interval Follow-Up Evaluation (Keller et al., 1987), an interviewer-administered instrument assessing symptoms and psychosocial functioning, with scores in the mild to moderately impaired range for work functioning.

The Relationship Between Competence and Performance

Although the association between depression and disability has been well established (Rhebergen et al., 2010; Papakostas et al., 2004; Judd et al., 2000; Wells et al., 1998), the relationship between competence and real-world performance in depressed individuals has received scant attention. In contrast, these constructs have been investigated in studies using cognitive remediation treatment for schizophrenia (e.g., Bowie et al., 2016), to detect the influence of improved cognition on proximal (i.e., competence) and distal (i.e., real-world performance) measures of functional outcome as a means of determining the efficacy of the treatment. Within the schizophrenia literature, these constructs have consistently shown to be correlated (Keefe, Poe, Walker, & Harvey, 2006; Bowie et al., 2006, 2008, 2010). For example, Bowie and colleagues (2006) discovered that functional capacity predicted real-world functioning in interpersonal, community, and work domains (r-values = .34, .61, and .54, respectively) in a sample of individuals with schizophrenia. While capacity was predictive of a significant proportion of real-world functioning, variance remains unaccounted for. This highlights that while capacity serves as a proxy for real-world functioning, there is a discrepancy that exists between capacity and performance. Indeed, Gupta and colleagues (2012) explain that level of performance is likely to be influenced by factors
external to ability, and therefore these factors should be considered distinct constructs and distinctly assessed.

A recent review (Harvey et al., 2012) maintained that functional impairment is a candidate endophenotype for severe mental illness, and the authors argued that measures of functional capacity are strongly related to real-world outcome; however, in spite of this, efforts to explain this relationship in depression remain incipient. One study (Gupta, 2011) has incorporated both competence and real-world performance in the depression literature, investigating a sample of individuals with treatment-resistant depression. In this research, participants’ interpersonal and adaptive competence were measured using a social skills role play developed for individuals with severe mental illness (Patterson et al., 2001b) and an adaptive everyday living skills task (Heaton et al., 2004), respectively, and their impairment in functioning was rated by a clinician-conducted semi-structured interview (Leon et al., 1999). The author found that neurocognitive variables and depressive symptoms predicted competence, but that only depressive symptoms predicted functional performance, suggesting that in a sample of individuals with severe and non-remitting depression, symptoms outweigh other factors in predicting how an individual performs in the real world. Additional investigations are needed to explore the relationship between competence and functioning in depressed individuals, importantly, to explore other intrinsic or extrinsic factors that influence functioning in individuals with this psychiatric illness.

As shown in schizophrenia, perhaps competence is likewise discrepant from functional performance in depression, warranting an investigation of these constructs. This would permit investigation of the factors that predict the difference between having important life skills and actually using those skills in the real world. In depression, this exploration remains a necessary step in identifying factors that influence individuals’ optimal deployment of their abilities in complex situations faced in everyday life.

**Self-efficacy as a Bridge of Competence to Performance in Depression**

One of the strongest theoretical candidates in bridging the competence-to-performance gap in depression is self-efficacy, which refers to an individual’s belief that he or she can produce certain desired
effects from his or her actions. Expectations of efficacy influence individuals’ choices and hopes, their level of effort and perseverance, their resilience to adversity and their vulnerability to stress and depression (Bandura, 1997). According to self-efficacy theory, one’s self-efficacy is a critical factor in the interaction between the environment and his or her behaviour (Bandura, 2012). For example, Bandura (2012) explained that peoples’ level of self-efficacy influences how they deal with barriers presented in the environment as well as which goals they will pursue. Meta-analytic research has found that self-efficacy relates to positive functioning in important areas of life, such as goal setting, good health behaviours, high well-being and adaptive coping strategies (Luszczynska, Scholz, & Schwarzer, 2005). Self-esteem is a related but broad concept, whereas self-efficacy is more discrete, easier to measure and more predictive of future functioning (Connolly, 1989).

In order to produce and regulate life events, Bandura (1997) explained the importance of developed self-efficacy. Performing well in real-world circumstances is a function of having the skills as well as the self-belief that one can use them (Bandura, 1997). For example, when challenged with obstacles, individuals who experience immense doubts about their capabilities have a tendency to lessen their efforts or forfeit a task, whereas those who feel a strong sense of self-efficacy will exert more effort (Bandura & Schunk, 1981). Low self-efficacy is a psychological concept related to Seligman’s theory of learned helplessness (Seligman, 1974) and Beck’s cognitive theory of depression (Beck, 1976). In adults, low self-efficacy is inversely correlated with depressive symptoms (Gondoli & Silverberg, 1997; Gross, Conrad, Fogg, & Wothke, 1994; Pakenham, Smith, & Rattan, 2007), thus the experience of depression might be particularly threatening to one’s self-efficacy. Within depression, characteristic withdrawal and disengagement from pleasurable and challenging activities may reduce or eliminate the opportunity to persevere through, and succeed in, important life situations. Without engagement in these experiences, depressed individuals may not be afforded the opportunity to exercise their skills to maintain a sense of self-mastery. As a result, depressed individuals’ self-efficacious beliefs about their abilities may deteriorate and further perpetuate disengagement from daily activities. In this way, self-efficacy may be
an integral factor in bridging the relationship between competence and real-world performance in depression.

Indeed, in the self-efficacy framework there is an apparent difference between having the competence to perform a task, and actually performing it well. Those with depression may have developed and maintained competence for interpersonal and adaptive functioning behaviours, but lack the confidence (i.e., self-efficacy) in their ability to successfully perform these behaviours in real-world settings, resulting in underperformance relative to ability level. To date, no study has examined the role of self-efficacy when trying to understand depressed individuals’ underperformance and functional disability in the real world. Further, an understanding of the relationship between competence and real-world performance in depression remains to be determined. The current study aimed to address these matters.

The Current Study

Research conducted on functional impairment in depression has largely focused on the role of depressive symptoms, comorbid psychiatric illness, and neurocognition. To date, there are no published data examining the potential discrepancy between competence and real-world performance in this population, and specific factors that may help understand whether or not depressed individuals deploy functional skills in their everyday life. Further, while measures of adaptive and interpersonal competence have been developed for use in severe mental illness, investigations of these tools in depressed samples remains sparse. An investigation of depressed individuals’ performance on these tools is required if they will be used in future research exploring the impact of depression on capacity to perform adaptive and interpersonal tasks.

The purpose of this study is to explore the discrepancy between competence (i.e., objective, performance-based measures of functioning) and real-world functional performance in depression, focusing on two domains of functioning (i.e., adaptive and interpersonal). Further, this study will investigate whether self-efficacy accounts for a significant proportion of these discrepancies after accounting for depressive symptomatology, a factor consistently found in previous research to predict disability in depression. Severity of anhedonia and social anxiety will also be measured, to investigate
how these symptoms may be associated with competence and functioning beyond depressive symptoms, and to adjust for the impact of these symptoms in analyses between self-efficacy and competence-performance discrepancy. Self-efficacy is commonly understood as being task- or domain-specific (Bandura, 1997), therefore domain-specific self-efficacy (i.e., adaptive versus interpersonal) will be parsed apart in the investigation of adaptive versus interpersonal functioning.

There are two objectives for this study:

1. Contextualize the impairment of depressed individuals on measures of adaptive and interpersonal competence and real-world functioning, and self-report measures of psychiatric symptoms and domain-specific self-efficacy, by comparing their scores to a sample of healthy comparison participants.

2. Identify the competence-performance discrepancy in the domains of adaptive and interpersonal functioning in a sample of depressed individuals, and determine whether self-efficacy significantly bridges this gap beyond the variance explained by depressive symptomatology, using domain-specific self-efficacy measures (i.e., interpersonal and adaptive self-efficacy).

Hypotheses

The following are hypothesized:

1. A. The depression group will perform significantly worse than healthy individuals on adaptive competence.

   B. The depression group will report significantly greater disability than healthy individuals in adaptive real-world functioning.

   C. The depression group will perform significantly worse than healthy individuals on interpersonal competence.

   D. The depression group will report significantly greater disability than healthy individuals in interpersonal real-world functioning.
(2) The depressed group will have significantly lower scores on self-efficacy (adaptive and interpersonal domains) than the healthy comparison group.

(3) Investigation of the depressed group will reveal that:

A. Adaptive self-efficacy (i.e., one’s belief in his or her ability to perform tasks conducive to everyday living and independent functioning) will account for a significant proportion of variance in the discrepancy between adaptive competence and real-world performance, beyond depressive symptomatology.

B. Interpersonal self-efficacy (i.e., one’s belief in his or her ability to perform actions conducive to successful initiation and maintenance of social skills) will account for a significant proportion of variance in the discrepancy between interpersonal competence and real-world functioning, beyond depressive symptomatology.
Chapter 2

Methods

Participants

An *a priori* power analysis was conducted using the program G*Power* (Faul, Erdfelder, Lang, & Buchner, 2007) to determine the appropriate sample size needed for the depression group in order to achieve the conventional power level of .80 in multiple regression, with a large effect size of .30. This supported a sample size of 40 participants in the depression group. Since the purpose of recruiting a healthy participant sample was for comparison with the depressed group to identify impairment of the depressed relative to healthy participants, the healthy participant group was smaller in size. It was decided *a priori* to attempt to recruit the groups so that they were matched on age and gender. Since the depression and healthy comparison groups were different in sample sizes, these groups were matched for age by recruiting an approximately equal proportion per sample in each of the following age bins: ages 18-28, 29-39, 40-50, and 51-60. The groups were matched for sex by recruiting an approximately equal proportion per sample of males to females. In total, 53 participants were recruited in the depression group and 23 in the healthy comparison group.

The inclusion criteria for both groups were English-speaking men and women, aged 18-60. Exclusion criteria for both groups included a medical diagnosis associated with neurocognitive impairment (e.g., dementia, cerebrovascular accident, traumatic brain injury), and other Axis I disorders. Additional exclusion criteria for the healthy comparison group included presently meeting criteria for any psychiatric illness, or having ever received a diagnosis of a psychiatric illness in the past. Eleven recruited individuals met exclusion criteria from the depression group following diagnostic interviewing (bipolar disorder, n = 6; substance dependence, n = 3; mood disorder with psychotic features, n = 1) or had neurocognitive impairment (n = 1) such that the participant was unable to understand instructions in order
to complete various study tasks. Three individuals in the healthy comparison group were excluded due to history of head trauma (n = 1) or current substance abuse (n = 2).

The final depression group consisted of a sample of community-dwelling individuals with a unipolar depressive disorder (N = 42) whereby the individuals either met current criteria for a major depressive episode (n = 31) or dysthymia (n = 6), with 19 individuals meeting criteria for both a major depressive episode and dysthymia at the time of participation. The remaining participants (n = 5) did not meet criteria for a major depressive episode or dysthymia at the time of study participation; however, these participants had received a formal diagnosis of MDD previously through a clinician, which was confirmed with retrospective diagnostic interviewing in this study. The final comparison sample of healthy individuals consisted of 20 community-dwelling participants. Participants were recruited using community advertisements in the Kingston, Ontario area.

**Measures**

**Diagnostic Criteria**

All participants were administered the Mini-International Neuropsychiatric Interview (M.I.N.I.; Sheehan et al., 1998), a structured diagnostic psychiatric interview, to determine whether participants in the depressed sample currently met criteria for major depressive episode, dysthymia, or other psychiatric disorders; and to ensure the healthy comparison sample did not currently meet criteria for any psychiatric illnesses. The participants in the healthy comparison sample were also asked about previous diagnoses or experience with symptoms pertaining to each of the M.I.N.I. diagnoses, to screen for having met criteria previously for each of the mental disorders queried. Further, the depressed sample was also asked about previous experience with symptoms pertaining to the M.I.N.I. diagnoses to identify whether they had previously met criteria for each of the diagnoses queried.

**Symptoms**

**Depression**
Presence and severity of depressive symptoms was obtained using the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996), a 21-item self-report measure. The BDI-II scores range from 0 to 63, with higher scores indicating more severe depressive symptoms. The BDI-II had an internal consistency of .92 among outpatients (Beck et al., 1996). The internal consistency reliability coefficient for the BDI-II in the current sample was .958 for the total sample, and .918 for the depressed sample.

**Anhedonia**

Anhedonia, the inability to experience pleasure, was measured using the Snaith-Hamilton Pleasure Scale (SHAPS; Snaith et al., 1995), a 14-item self-report measure. The SHAPS scores range from 0 to 14, with higher scores representing lower hedonic capacity. This measure had an internal consistency coefficient of .82 among outpatient individuals with MDD (Nakonezny et al., 2015). In the current sample, the internal consistency coefficient was .847 for the full sample, and .797 for the depressed sample.

**Social Anxiety**

Social anxiety was measured using the Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998), a 20-item self-report measure with scores ranging from 0 to 80 (higher scores indicating greater social anxiety). The internal consistency of the SIAS was .90 in community samples, and .91-.93 in clinical samples (Mattick & Clarke, 1998). In the present study, internal consistency was .950 for the total sample, and .945 for the depressed sample.

**Performance-based Measures of Functional Competence**

**Adaptive Competence**

The University of California, San Diego Performance-Based Skills Assessment Battery (UPSA; Patterson et al., 2001a) was used to assess participants’ competence to perform functional skills in four domains through utilization of various props and role-plays in which the participant demonstrated financial skills (counting change and reading/understanding a utility bill in order to properly pay it), instrumental communication (calling directory assistance for a telephone number and leaving a voicemail
to reschedule a medical appointment), planning activities (planning items to bring and activities to do on a trip to a water park), and understanding and interpreting public transportation (using a bus schedule to plan bus routes to destinations provided by the assessor). Scores per domain on the UPSA were totaled, and this value was converted to percent accuracy out of 100, thus scores range from 0 – 100 % with higher accuracy indicating better adaptive competence. Consistent with previous studies (Bowie et al., 2006, 2008, 2010), the household activities domain (cooking and groceries) of the UPSA was not included due to limited variability and reliability. In prior research, the UPSA had a 12-month test-retest reliability of .80 (Leifker, Patterson, Bowie, Mausbach, & Harvey, 2010).

**Interpersonal Competence**

The Social Skills Performance Assessment (SSPA; Patterson et al., 2001b) is a measure of social competence and communication consisting of three scenes, each in which the participants initiated and maintained a conversation with the examiner. In Scene 1 (1 minute in length) the participant was asked to discuss making recreational plans with a friend. In Scene 2 (3 minutes in length) the participant was to greet a new neighbor. In Scene 3 (3 minutes in length) the participant was asked to call a landlord to request a repair for a leak that has gone unrepaired. The examiner reciprocated the conversation as initiated by the participant, using prescribed prompts as needed. The SSPA was audiotaped and independently scored by two trained raters who were unaware of diagnosis, study purpose or procedures, and all other data. Traditionally, Scene 1 has been used as a practice session, with only Scenes 2 and 3 being scored. In the present study, a scoring scheme was developed for Scene 1 to enable interpersonal competence in making recreational plans with a friend to be integrated with the other two scenes into a comprehensive score in interpersonal competence that consisted of skills in engaging in social recreational plan-making, greeting a new neighbor, and negotiating with a landlord.

To create scoring anchors for Scene 1, the scoring key for Scene 2 was adapted to reflect the context and goals of Scene 1 (Patterson & Goldman, 2008). Each scene was scored on a behaviourally anchored rating scale from 1 (*low*) to 5 (*high*) in the following categories: Interest/Disinterest (the participant’s motivation and willingness to engage in the interaction), Fluency (the participant’s overall
flow of conversation as determined by speech mannerisms), Clarity (a measure of the extent to which the participant was able or willing to express him/herself clearly and directly), Focus (the participant’s ability to consistently concentrate on and track the content of the role play), Affect (a quantification of paralinguistics such as voice volume, tone of voice, and inflection), Overall Conversation (a comprehensive rating of the participant’s ability to make plans with a friend or meet the new neighbor in Scenes 1 and 2, respectively), and Social Appropriateness (reflects the participant’s adequate conduct during the scene). The landlord scene (Scene 3) includes additional ratings for Negotiation Ability (rating of the willingness and ability of the participant to generate solutions and make compromises), Submission/Persistence (the extent to which the participant was able/willing to stick firmly to his/her goal of reaching a resolution), and Overall Argument (a comprehensive rating of the participant’s interaction with the landlord). The administrator also scored the participants’ grooming, an item ranging from 1 – 5. Per scene, scores range from 7 – 35 for Scenes 1 and 2, and 9 – 45 for Scene 3. The total score across the 3 SSPA Scenes ranges from 23 – 115. With the addition of the grooming item, scores range from 24 – 120. Accuracy in interpersonal competence per participant was defined as the proportion of the maximum possible score achieved, resulting in accuracy scores that range from 0 – 100 %. Higher accuracy scores indicated better interpersonal competence.

The two SSPA raters, undergraduate research assistants who were trained to the gold standard ratings proposed by the instrument developers (ICC = .86), independently scored each participant’s SSPA recording. Consensus meetings were held with the principal investigator and the two raters to discuss all ratings on which raters were discrepant, until consensus on ratings was met. The reliability of the items that comprise the SSPA total score in the current sample was .853 for the full sample and .845 for the depressed group. Cronbach’s alpha was .747 for the full sample and .748 for the depressed group on Scene 1; .688 for the full sample and .709 for the depressed group on Scene 2; and .766 for the full sample and .745 for the depressed group on Scene 3.
Real-world Functional Disability

Real-world disability in the domains of adaptive and interpersonal functioning were measured using the World Health Organization Disability Assessment Schedule-II (WHODAS-II; World Health Organization, 2000), a 36-item disability assessment interview that assesses six domains of real-world functioning (understanding and communicating, getting around, self-care, getting along with people, life activities, and participation in society), asking the participant to rate the extent to which he or she experienced difficulty on each item in the last 30 days, using a response Likert-scale from 1 = none to 5 = extreme/cannot do.

Adaptive Performance

Functional disability in adaptive behaviours was assessed using the “Life activities” domain of the WHODAS-II, referred to in the current study as WHODAS-II – Adaptive domain. The “Life activities” domain consists of 4 items asked by the interviewer assessing difficulty in managing household tasks (i.e., difficulties in completing all necessary housework), and 4 items that determine difficulty in vocational or student roles (i.e., difficulties in daily work/school and completing all necessary work/school tasks). WHODAS-II scores for the “Life activities” domain (i.e., WHODAS-II – Adaptive domain) may range from 8 to 40 (higher scores indicate greater functional disability in adaptive behaviours). The present sample had an internal consistency of .933 in the total sample and .870 in the depressed group on the WHODAS-II – Adaptive domain.

Interpersonal Performance

To measure interpersonal functional impairment (i.e., disability in social behaviours) the “Getting along with people” domain of the WHODAS-II (5 items) was used, which assesses difficulty in social interactions (i.e., difficulties in getting along with close others, or making new friends). In addition, two items from the “Understanding and communicating” domain (i.e., difficulties in understanding what people say, and difficulties initiating and maintaining conversation) were included due to their theoretical link to social functioning. Reliability analysis revealed fairly low internal consistency (α = .685) among
the 7 items in the depressed group. Removal of the sexual functioning item (i.e., difficulties in sexual activities) increased Cronbach’s alpha among the remaining 6 items to .710 for the depressed group and .791 for the full sample. Theoretically, difficulties in sexual functioning may not fit with the other items used in the interpersonal domain that inquire more broadly about communicative situations, for example, about difficulties associated with understanding what others say, getting along with close others, and maintaining social relationships. The remaining 6 items comprising the WHODAS-II – Interpersonal domain sample functional disability pertaining to successful and maintained social interactions; therefore, sexual performance is not surprisingly inconsistent with these items, and thus this item was excluded. Participants responded based on the 5-point Likert scale explained above, resulting in a range of social disability from 6 to 30 (a higher score indicates greater social disability).

**Measures of Self-efficacy**

Participants completed a Revised Self-Efficacy Scale (RSES; McDermott, 1995; Cardenas et al., 2013) to assess level of confidence for performing certain desired behaviours on a scale from 1 = *not at all confident* to 5 = *extremely confident*. The RSES consists of 35 items that can be broken up into 2 different subscales/domains representing one’s self-efficacy for: (1) performing everyday functioning tasks (e.g., “Go to a job interview”, “Go shopping for groceries”; 19 items [scores range from 19-95]; referred to in the current study as RSES – Adaptive domain) and (2) engaging in social activities (e.g., “Begin a conversation with a friend”, “Introduce yourself to someone you don’t know”; 16 items [scores range from 16-80]; referred to in the present study as RSES – Interpersonal domain). Higher scores represent greater self-efficacy. Internal consistency for the RSES – Adaptive domain was .938 for the total sample and .843 for the depression group. For the RSES – Interpersonal domain, internal consistency was .913 for the total sample and .864 for the depression group.

**Procedure**

The current study was granted ethics approval by the Queen’s University Health Sciences & Affiliated Teaching Hospitals Research Ethics Board (HSREB; see Appendix A for letter of ethics.
clearance). Data were collected over one session taking approximately 1.5 to 2 hours to complete per participant. Participants were compensated $40 for their time. Full assessments were conducted by the primary investigator, a graduate student in a clinical psychology program. The order of assessment was fixed. Upon arrival, the graduate student reviewed the letter of information and consent form with each participant. After participants provided written, informed consent, demographic information (age, marital status, education, work status, present diagnoses) was collected. Next, participants completed self-report measures of self-efficacy and depression symptom severity. Participants were then administered the SSPA and the UPSA. The order of the SSPA and UPSA was randomized by assigning an order generated by a web-based randomizer (Urbaniak & Plous, 2015). Next, the graduate student administered the M.I.N.I., WHODAS-II interview, and lastly, participants completed two final self-report measures: SHAPS and SIAS.

**Data Analysis**

Chi-square analyses were conducted with depressed and healthy comparison groups on categorical descriptive characteristics (sex, ethnicity, highest level of education achieved, and marital status). The only demographic variable on which the groups significantly differed was years of education, thus this difference was adjusted for in analyses completed to address the hypothesis that the depressed group would perform more poorly than the healthy comparison group across measures. Analysis of covariance was conducted between the groups on the measures of competence (UPSA Accuracy and SSPA Accuracy), real-world functioning (WHODAS-II – Adaptive domain and WHODAS-II – Interpersonal domain), self-efficacy (RSES – Adaptive domain and RSES – Interpersonal domain), and symptoms (BDI-II, SHAPS, and SIAS).

The remainder of analyses included the depressed sample only. Two-tailed bivariate correlations were examined between each competence (UPSA Accuracy and SSPA Accuracy), real-world functioning (Adaptive and Interpersonal domains of the WHODAS-II), and self-efficacy (Adaptive and Interpersonal domains of the RSES) variable and symptoms (BDI-II, SHAPS, and SIAS) to explore the relationship of symptoms to ability, deployment of ability in the real world, and self-efficacy beliefs, respectively. Also,
two-tailed bivariate correlations were used to examine the strength of association between competence, real-world functioning and self-efficacy variables.

To address whether self-efficacy predicted the discrepancy between competence and performance, regression analyses were performed between each individual’s adaptive competence (UPSA Accuracy; predictor) and functional performance (WHODAS-II – Adaptive domain; outcome) score, as well as between their interpersonal competence (SSPA Accuracy) and functioning (WHODAS-II – Interpersonal domain) score. The residuals that remained after accounting for variability in adaptive and interpersonal functioning explained by the respective competence variables were defined as the discrepancies between competence and performance for the two domains of functioning.

Next, hierarchical regression analysis was conducted to determine whether self-efficacy predicted additional variance in competence-performance discrepancy after accounting for depression symptoms. For each regression, BDI-II total score was entered into block 1 to quantify the variance in discrepancy accounted for by depressive symptom severity. In block 2, self-efficacy (either RSES – Adaptive for the adaptive domain, or RSES – Interpersonal for the interpersonal domain) was entered to see whether this variable predicted significant additional variance in the competence-performance discrepancy. Additional symptoms (SHAPS and/or SIAS) were included in a second hierarchical regression per domain if they were significantly correlated with the respective residual variable, to determine whether these symptoms further predicted the gap between competence and performance, external to depressive symptoms, prior to entering self-efficacy. Analyses were checked for multicollinearity using the tolerance and variance inflation matrix values.

Correlation coefficients were examined between the two types of self-efficacy and corresponding functional disability (adaptive and interpersonal). These correlations were transformed to z-scores and a two-sample z-test for the significance of the difference between the correlations was conducted. This exploration of the specificity of self-efficacy was done to inform whether adaptive self-efficacy was more highly correlated with adaptive functioning than interpersonal self-efficacy was with interpersonal functioning, and vice versa.
Chapter 3

Results

Participants

The depression group was comprised of a sample of 42 participants. Twenty-seven of these participants (i.e., 64% of the depressed sample) were taking psychotropic medication at the time of participation (see Table 1 for medications). The comparison sample of healthy individuals consisted of 20 participants. Please refer to Table 2 for descriptive characteristics of the overall sample and by group. The groups were matched for age and sex and they did not significantly differ on these two variables. A significant difference between depressed individuals and healthy participants on ethnicity and marital status was not found; however, the depressed sample had significantly fewer years of education.

Table 1. Psychotropic medications of depressed sample

<table>
<thead>
<tr>
<th>Medication</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antidepressants</strong></td>
<td></td>
</tr>
<tr>
<td>Norepinephrine-Dopamine Reuptake Inhibitor</td>
<td>6 (14.29)</td>
</tr>
<tr>
<td>Serotonin-Norepinephrine Reuptake Inhibitor</td>
<td>8 (19.05)</td>
</tr>
<tr>
<td>Selective Serotonin Reuptake Inhibitor</td>
<td>16 (38.10)</td>
</tr>
<tr>
<td>Tetracyclic</td>
<td>7 (16.67)</td>
</tr>
<tr>
<td><strong>Benzodiazepine</strong></td>
<td></td>
</tr>
<tr>
<td>Atypical Antipsychotic</td>
<td>8 (19.05)</td>
</tr>
<tr>
<td><strong>Atypical Antipsychotic</strong></td>
<td></td>
</tr>
<tr>
<td>Atypical Antipsychotic</td>
<td>4 (9.52)</td>
</tr>
</tbody>
</table>
Table 2. Descriptive characteristics of the overall sample and by group

<table>
<thead>
<tr>
<th></th>
<th>Depression Group</th>
<th>Healthy Comparison Group</th>
<th>Total</th>
<th>Statistic</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n = 42)</td>
<td>(n = 20)</td>
<td>(N = 62)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age M (SD)</td>
<td>37.64 (13.61)</td>
<td>39.50 (10.76)</td>
<td>38.24 (12.71)</td>
<td>F(1,60) = .29</td>
<td>.595</td>
</tr>
<tr>
<td>Sex n (%)</td>
<td></td>
<td></td>
<td></td>
<td>χ²(1) = .02</td>
<td>.897</td>
</tr>
<tr>
<td>Female</td>
<td>28 (66.67)</td>
<td>13 (65.0)</td>
<td>41 (66.13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>14 (33.33)</td>
<td>7 (35.0)</td>
<td>21 (33.87)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnicity n (%)</td>
<td></td>
<td></td>
<td></td>
<td>χ²(4) = 2.59</td>
<td>.628</td>
</tr>
<tr>
<td>Caucasian</td>
<td>35 (83.33)</td>
<td>19 (95.0)</td>
<td>54 (87.10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latino/Hispanic</td>
<td>2 (4.76)</td>
<td>0</td>
<td>2 (3.23)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle Eastern</td>
<td>2 (4.76)</td>
<td>1 (5.0)</td>
<td>3 (4.84)</td>
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<td></td>
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<tr>
<td>South Asian</td>
<td>2 (4.76)</td>
<td>0</td>
<td>2 (3.23)</td>
<td></td>
<td></td>
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<tr>
<td>Aboriginal</td>
<td>1 (2.39)</td>
<td>0</td>
<td>1 (1.60)</td>
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<tr>
<td>Highest Education Achieved n (%)</td>
<td></td>
<td></td>
<td></td>
<td>χ²(5) = 21.26</td>
<td>.001</td>
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<tr>
<td>Some high school</td>
<td>2 (4.76)</td>
<td>0</td>
<td>2 (3.23)</td>
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<tr>
<td>High school diploma/GED</td>
<td>3 (7.14)</td>
<td>0</td>
<td>3 (4.84)</td>
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<tr>
<td>Some college/university</td>
<td>14 (33.33)</td>
<td>0</td>
<td>14 (22.58)</td>
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<td></td>
</tr>
<tr>
<td>College diploma</td>
<td>12 (28.57)</td>
<td>3 (15.0)</td>
<td>15 (24.19)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University degree</td>
<td>7 (16.67)</td>
<td>8 (40.0)</td>
<td>15 (24.19)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post graduate degree</td>
<td>4 (9.53)</td>
<td>9 (45.0)</td>
<td>13 (20.97)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Years of Education M (SD)</td>
<td></td>
<td></td>
<td></td>
<td>F(1,60) = 18.05</td>
<td>.000</td>
</tr>
<tr>
<td>Marital Status n (%)</td>
<td></td>
<td></td>
<td></td>
<td>χ²(4) = 6.15</td>
<td>.188</td>
</tr>
<tr>
<td>Never married</td>
<td>20 (47.62)</td>
<td>6 (30.0)</td>
<td>26 (41.94)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married/Common-law</td>
<td>10 (23.81)</td>
<td>10 (50.0)</td>
<td>20 (32.26)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separated</td>
<td>7 (16.67)</td>
<td>1 (5.0)</td>
<td>8 (12.90)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divorced and not remarried</td>
<td>4 (9.53)</td>
<td>3 (15.0)</td>
<td>7 (11.29)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td>1 (2.37)</td>
<td>0</td>
<td>1 (1.61)</td>
<td></td>
<td></td>
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<tr>
<td>Symptoms M (SE)a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression (BDI-II)</td>
<td>26.80 (1.64)</td>
<td>5.02 (2.49)</td>
<td>15.91 (1.41)</td>
<td>F(1,59) = 47.84</td>
<td>.000</td>
</tr>
<tr>
<td>Anhedonia (SHAPS)</td>
<td>3.56 (.42)</td>
<td>.03 (.64)</td>
<td>1.79 (.36)</td>
<td>F(1,59) = 19.30</td>
<td>.000</td>
</tr>
<tr>
<td>Social Anxiety (SIAS)</td>
<td>37.53 (2.56)</td>
<td>24.38 (3.89)</td>
<td>30.96 (2.19)</td>
<td>F(1,59) = 7.19</td>
<td>.010</td>
</tr>
</tbody>
</table>

a Covariate used in ANCOVA evaluated at the value of 15.06 years of education. b Higher score = more symptoms. c Possible range: 0 – 63. d Possible range: 0 – 14. e Possible range: 0 – 80.
Between Group Analyses

Between group analysis was conducted between the depression and healthy comparison groups for each of the competence, functional disability, and self-efficacy variables to determine group differences. Since the groups significantly differed on years of education \( F(1,60) = 18.05, p < .001, \eta_p^2 = .231 \), analysis of covariance (ANCOVA) was run to test between group differences, to adjust for the difference in years of education. See Table 3 for non-adjusted means and standard deviations, and the ANCOVA results between the groups for all measures. The following results state ANCOVA-adjusted group means and standard errors. The covariate of years of education used in the ANCOVA analyses was evaluated at the value of 15.06 years of education. All measures listed in Tables 3 had a skewness value below 1.5 and a kurtosis value below 3.0.

Competence

Adaptive Competence

The ANCOVA between the depressed \((M = 85.46, SE = 1.05)\) and healthy \((M = 88.73, SE = 1.56)\) groups on UPSA Accuracy was not statistically significant, \( F(1,59) = 2.66, p = .109, \eta_p^2 = .043 \). The UPSA consisted of 4 domains: financial skills, instrumental communication, comprehension and planning, and transportation. Differences between groups were compared per domain for exploratory purpose, to isolate any specific domains of impairment in the depressed relative to healthy group that wash out when all domains are compiled into the complete measure. There was no significant difference between the depressed group \((M = 90.73, SE = 1.42)\) and healthy comparison group \((M = 95.31, SE = 2.15)\) on financial skills \( F(1,59) = 2.85, p = .097, \eta_p^2 = .046 \). There was no significant difference between the depressed \((M = 86.10, SE = 1.52)\) and healthy \((M = 87.40, SE = 2.30)\) on comprehension and planning \( F(1,59) = .20, p = .657, \eta_p^2 = .003 \), nor was there a significant difference between the depressed \((M = 83.85, SE = 2.27)\) and healthy \((M = 86.14, SE = 3.44)\) on transportation \( F(1,59) = .28, p = .599, \eta_p^2 = .005 \). The depressed group performed significantly worse on instrumental
communication ($M = 80.60, SE = 1.53$) than the healthy group ($M = 86.99, SE = 2.33$), $[F(1,59) = 4.75, p = .033, \eta^2_p = .074]$. 

**Interpersonal Competence**

The depressed group ($M = 86.73, SE = .90$) was significantly lower than the healthy comparison group ($M = 90.95, SE = 1.36$) on SSPA Accuracy, $[F(1,59) = 6.03, p = .017, \eta^2_p = .093]$. To explore whether there were differences between groups per scene of the SSPA, additional ANCOVA were run. The depressed group ($M = 89.17, SE = 1.04$) performed significantly worse than the healthy group ($M = 96.12, SE = 1.58$) on Scene 1 (making plans with a friend), $[F(1,59) = 12.13, p = .001, \eta^2_p = .171]$. There was a trend-level significant difference between the groups on Scene 2 (greeting a new neighbor) in favor of better performance by the healthy comparison group ($M = 91.45, SE = 1.55$) relative to the depressed group ($M = 87.82, SE = 1.02$), $[F(1,59) = 3.44, p = .069, \eta^2_p = .055]$. There was no significant difference between the depressed ($M = 84.67, SE = 1.18$) or healthy comparison ($M = 86.79, SE = 1.80$) groups on Scene 3 (negotiating with a landlord), $[F(1,59) = .87, p = .354, \eta^2_p = .015]$. 

**Real-world Performance: Adaptive and Interpersonal Domains**

The depressed group reported significantly greater disability in adaptive behaviours ($M = 23.08, SE = 1.09$) than the healthy comparison group ($M = 9.54, SE = 1.66$), $[F(1,59) = 41.84, p < .001, \eta^2_p = .415]$. The depressed group reported significantly greater disability in interpersonal behaviours ($M = 12.66, SE = .57$) than the healthy comparison group ($M = 8.32, SE = .86$), $[F(1,59) = 15.78, p < .001, \eta^2_p = .290]$. 

**Self-efficacy: Adaptive and Interpersonal Domains**

The depressed group reported significantly lower adaptive self-efficacy ($M = 56.19, SE = 1.54$) than the healthy comparison group ($M = 76.80, SE = 2.34$), $[F(1,59) = 48.67, p < .001, \eta^2_p = .452]$. The depressed group reported significantly lower interpersonal self-efficacy ($M = 46.93, SE = 1.47$) than the healthy comparison group ($M = 60.80, SE = 2.24$), $[F(1,59) = 24.16, p < .001, \eta^2_p = .290]$. 

28
Post-hoc Investigation of Education Level

There was a significant difference between the depressed and healthy groups on all variables (in favor of the healthy comparison group for better competence, less functional impairment, higher self-efficacy and less symptoms) except for accuracy on the UPSA. This warrants a post-hoc exploration into whether depressed individuals are indeed not likely significantly impaired relative to healthy participants, or if this finding was perhaps a result of having recruited healthy individuals with significantly more education relative to depressed individuals than would be expected in the population. Unintentionally, the healthy comparison group consisted only of individuals who had achieved at least a college degree or higher. In an exploratory analysis, a subgroup of the depressed sample who achieved a college degree or higher (n = 23) were selected for comparison to the healthy comparison sample. This new depression group no longer significantly differed from healthy individuals on years of education \( F(1,41) = 3.19, p = .081, \eta_p^2 = .072 \), nor did the groups significantly differ on age \( F(1,41) = .12, p = .728, \eta_p^2 = .003 \), gender \( \chi^2(1) = .08, p = .780, \phi = .043, p = .780 \), ethnicity \( \chi^2(3) = 1.83, p = .609, \phi_{Cramer} = .206, p = .609 \), or marital status \( \chi^2(3) = 2.84, p = .418, \phi_{Cramer} = .257, p = .418 \). Analysis of variance conducted between these groups on UPSA Accuracy revealed the higher education depression subsample performed significantly poorer (\( M = 85.52, SD = 6.99 \)) than the healthy comparison sample (\( M = 89.55, SD = 5.65 \)), \( F(1,41) = 4.23, p = .046, \eta_p^2 = .094 \). This suggests that plausibly, a significant difference was not detected between the groups on UPSA Accuracy in the initial ANCOVA analysis due to sampling error (i.e., significantly lower years of education in the depressed sample as compared to the healthy comparison sample) rather than an actual lack of difference between the groups. Indeed, when the groups are similar in education level, a significant difference on UPSA Accuracy exists.
<table>
<thead>
<tr>
<th></th>
<th>Depression Group</th>
<th>Healthy Comparison Group</th>
<th>ANCOVA Statistic (adjusting for years of education)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Observed Range</td>
<td>M</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Competence</td>
<td></td>
<td>Observed Range</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>UPSA Accuracy a</td>
<td>74 – 98</td>
<td>85.07</td>
<td>6.86</td>
<td></td>
</tr>
<tr>
<td>(Possible range: 0 – 100%)</td>
<td></td>
<td>80 – 98</td>
<td>89.55</td>
<td>5.65</td>
</tr>
<tr>
<td>F(1,59) = 2.66</td>
<td></td>
<td>.109</td>
<td>F(1,59) = 2.85</td>
<td>.097</td>
</tr>
<tr>
<td>UPSA – Financial a</td>
<td>67 – 100</td>
<td>89.88</td>
<td>10.00</td>
<td></td>
</tr>
<tr>
<td>(Possible range: 0 – 100 %)</td>
<td></td>
<td>75 – 100</td>
<td>97.08</td>
<td>6.21</td>
</tr>
<tr>
<td>F(1,59) = 4.75</td>
<td></td>
<td>.033</td>
<td>F(1,59) = .20</td>
<td>.657</td>
</tr>
<tr>
<td>UPSA – Communication a</td>
<td>58 – 100</td>
<td>80.36</td>
<td>9.53</td>
<td></td>
</tr>
<tr>
<td>(Possible range: 0 – 100 %)</td>
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<td>67 – 100</td>
<td>87.50</td>
<td>9.17</td>
</tr>
<tr>
<td>F(1,59) = .20</td>
<td></td>
<td>.097</td>
<td>F(1,59) = .28</td>
<td>.599</td>
</tr>
<tr>
<td>UPSA – Planning a</td>
<td>64 – 100</td>
<td>86.22</td>
<td>9.39</td>
<td></td>
</tr>
<tr>
<td>(Possible range: 0 – 100 %)</td>
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<td>71 – 100</td>
<td>87.14</td>
<td>9.15</td>
</tr>
<tr>
<td>F(1,59) = .20</td>
<td></td>
<td>.097</td>
<td>F(1,59) = .28</td>
<td>.599</td>
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<tr>
<td>UPSA – Transportation a</td>
<td>56 – 100</td>
<td>83.33</td>
<td>15.37</td>
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<tr>
<td>(Possible range: 0 – 100 %)</td>
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<td>67 – 100</td>
<td>87.22</td>
<td>10.37</td>
</tr>
<tr>
<td>F(1,59) = .28</td>
<td></td>
<td>.097</td>
<td>F(1,59) = .28</td>
<td>.599</td>
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<tr>
<td>SSPA Accuracy a</td>
<td>73 – 97</td>
<td>86.33</td>
<td>6.37</td>
<td></td>
</tr>
<tr>
<td>(Possible range: 0 – 100 %)</td>
<td></td>
<td>86 – 98</td>
<td>91.79</td>
<td>3.42</td>
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<tr>
<td>F(1,59) = 6.03</td>
<td></td>
<td>.017</td>
<td>F(1,59) = 12.13</td>
<td>.001</td>
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<tr>
<td>SSPA – Scene 1 a,d</td>
<td>73 – 100</td>
<td>89.17</td>
<td>7.56</td>
<td></td>
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<tr>
<td>(Possible range: 0 – 100 %)</td>
<td></td>
<td>93 – 100</td>
<td>96.13</td>
<td>2.36</td>
</tr>
<tr>
<td>F(1,59) = 12.13</td>
<td></td>
<td>.001</td>
<td>F(1,59) = 3.44</td>
<td>.069</td>
</tr>
<tr>
<td>SSPA – Scene 2 a,d</td>
<td>68 – 100</td>
<td>87.08</td>
<td>7.53</td>
<td></td>
</tr>
<tr>
<td>(Possible range: 0 – 100 %)</td>
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<td>88 – 98</td>
<td>93.00</td>
<td>3.77</td>
</tr>
<tr>
<td>F(1,59) = 3.44</td>
<td></td>
<td>.069</td>
<td>F(1,59) = .87</td>
<td>.354</td>
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<tr>
<td>SSPA – Scene 3 a,d</td>
<td>68 – 94</td>
<td>84.10</td>
<td>7.74</td>
<td></td>
</tr>
<tr>
<td>(Possible range: 0 – 100 %)</td>
<td></td>
<td>74 – 98</td>
<td>88.00</td>
<td>6.68</td>
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<td>Observed Range</td>
<td>M</td>
<td>SD</td>
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<tr>
<td>Adaptive domain b</td>
<td>9 – 40</td>
<td>23.38</td>
<td>8.13</td>
<td></td>
</tr>
<tr>
<td>(Possible range: 8 – 40)</td>
<td></td>
<td>8 – 12</td>
<td>8.90</td>
<td>1.12</td>
</tr>
<tr>
<td>F(1,59) = 41.84</td>
<td></td>
<td>.000</td>
<td>F(1,59) = 15.78</td>
<td>.000</td>
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<tr>
<td>Interpersonal domain b</td>
<td>6 – 21</td>
<td>13.05</td>
<td>4.29</td>
<td></td>
</tr>
<tr>
<td>(Possible range: 6 – 30)</td>
<td></td>
<td>6 – 11</td>
<td>7.50</td>
<td>1.47</td>
</tr>
</tbody>
</table>

* Table continued on next page
### Self-efficacy (RSES)

<table>
<thead>
<tr>
<th></th>
<th>Depression Group</th>
<th></th>
<th>Healthy Comparison Group</th>
<th></th>
<th>ANCOVA Statistic (adjusting for years of education)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Observed Range</td>
<td>M</td>
<td>SD</td>
<td>Observed Range</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Adaptive domain †</td>
<td>37 – 86</td>
<td>54.88</td>
<td>10.41</td>
<td>66 – 93</td>
<td>79.55</td>
<td>9.36</td>
</tr>
<tr>
<td>Interpersonal domain †</td>
<td>29 – 77</td>
<td>45.86</td>
<td>10.34</td>
<td>53 – 79</td>
<td>63.05</td>
<td>7.29</td>
</tr>
</tbody>
</table>

*Higher score = better competence, †Higher score = greater functional disability, ‡Higher score = greater self-efficacy, ††SSPA Grooming item applied as a constant in each of the 3 domains.
Correlations

Correlations among all measures used in this study are presented in Tables 4-6. Two-tailed correlations were conducted among variables since the analyses between the variables were novel, uninformed by the literature.
Table 4. Two-tailed correlations between symptoms and competence, performance, and self-efficacy in the depression group

<table>
<thead>
<tr>
<th></th>
<th>UPSA Accuracy b</th>
<th>SSPA Accuracy b</th>
<th>WHODAS-II (Adaptive) c</th>
<th>WHODAS-II (Interpersonal) c</th>
<th>RSES (Adaptive) d</th>
<th>RSES (Interpersonal) d</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDI-II a</td>
<td>.013</td>
<td>-.436</td>
<td>.637</td>
<td>.588</td>
<td>-.549</td>
<td>-.571</td>
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<tr>
<td></td>
<td>(p = .935)</td>
<td>(p = .004)</td>
<td>(p &lt; .001)</td>
<td>(p &lt; .001)</td>
<td>(p &lt; .001)</td>
<td>(p &lt; .001)</td>
</tr>
<tr>
<td>SHAPS a</td>
<td>.022</td>
<td>-.563</td>
<td>.268</td>
<td>.357</td>
<td>-.207</td>
<td>-.494</td>
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<tr>
<td></td>
<td>(p = .889)</td>
<td>(p &lt; .001)</td>
<td>(p = .087)</td>
<td>(p = .020)</td>
<td>(p = .189)</td>
<td>(p = .001)</td>
</tr>
<tr>
<td>SIAS a</td>
<td>-.170</td>
<td>-.405</td>
<td>.262</td>
<td>.541</td>
<td>-.504</td>
<td>-.756</td>
</tr>
<tr>
<td></td>
<td>(p = .282)</td>
<td>(p = .008)</td>
<td>(p = .094)</td>
<td>(p &lt; .001)</td>
<td>(p = .001)</td>
<td>(p &lt; .001)</td>
</tr>
</tbody>
</table>

a Higher score = more symptoms, b Higher score = better competence, c Higher score = greater functional disability, d Higher score = greater self-efficacy.

Table 5. Two-tailed correlations among competence, performance, and self-efficacy in the depression group

<table>
<thead>
<tr>
<th></th>
<th>UPSA Accuracy a</th>
<th>SSPA Accuracy a</th>
<th>WHODAS-II (Adaptive) b</th>
<th>WHODAS-II (Interpersonal) b</th>
<th>RSES (Adaptive) c</th>
<th>RSES (Interpersonal) c</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPSA Accuracy a</td>
<td>-</td>
<td>.135</td>
<td>.087</td>
<td>-.133</td>
<td>.058</td>
<td>.096</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(p = .395)</td>
<td>(p = .582)</td>
<td>(p = .402)</td>
<td>(p = .716)</td>
<td>(p = .543)</td>
</tr>
<tr>
<td>SSPA Accuracy a</td>
<td></td>
<td></td>
<td>-.290</td>
<td>-.474</td>
<td>.173</td>
<td>.457</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(p = .062)</td>
<td>(p = .002)</td>
<td>(p = .273)</td>
<td>(p = .002)</td>
</tr>
<tr>
<td>WHODAS-II (Adaptive) b</td>
<td></td>
<td></td>
<td></td>
<td>.515</td>
<td>-.576</td>
<td>-.372</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(p &lt; .001)</td>
<td>(p &lt; .001)</td>
<td>(p = .015)</td>
</tr>
<tr>
<td>WHODAS-II (Interpersonal) b</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.443</td>
<td>-.593</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(p = .003)</td>
<td>(p &lt; .001)</td>
</tr>
</tbody>
</table>

a Higher score = better competence, b Higher score = greater functional disability, c Higher score = greater self-efficacy.
**Symptom Severity, Competence, Real-world Performance, and Self-efficacy**

BDI-II was significantly positively correlated with WHODAS-II – Adaptive domain and WHODAS-II – Interpersonal domain, such that greater depressive symptoms was significantly associated with greater adaptive and interpersonal functional disability. BDI-II significantly negatively correlated with SSPA Accuracy, RSES – Adaptive domain and RSES – Interpersonal domain, such that greater depressive symptoms was significantly associated with poorer interpersonal competence and lower self-efficacy in adaptive and interpersonal domains. SHAPS was significantly positively correlated with WHODAS-II – Interpersonal domain and significantly negatively correlated with SSPA Accuracy and RSES – Interpersonal domain such that greater anhedonia was significantly related to greater interpersonal disability, lower interpersonal competence, and lower interpersonal self-efficacy. SIAS significantly positively correlated with WHODAS-II – Interpersonal domain and significantly negatively correlated with SSPA Accuracy, RSES – Adaptive domain and RSES – Interpersonal domain, such that greater social anxiety was significantly related to greater interpersonal disability, worse interpersonal competence, and lower adaptive and interpersonal self-efficacy.

A family-wise Bonferroni correction was applied, such that depression (BDI-II), anhedonia (SHAPS) and social anxiety (SIAS) symptoms were classified as separate families. The adjusted critical p-value for the correlations between each of the symptom measures (i.e., BDI-II, SHAPS, SIAS) and the competence, real-world functioning, and self-efficacy measures was .05/6 = .008. After applying this correction, all correlations initially significant remained as such; however, WHODAS-II – Interpersonal domain no longer retained a significant correlation with SHAPS.

**Competence, Real-world Performance, and Self-efficacy**

UPSA Accuracy was not significantly correlated with SSPA Accuracy, WHODAS-II Adaptive and Interpersonal domains, or RSES Adaptive and Interpersonal domains. SSPA Accuracy significantly positively correlated with RSES – Interpersonal domain and significantly negatively correlated with WHODAS-II – Interpersonal domain, such that greater interpersonal competence was significantly related
to greater interpersonal self-efficacy and lower interpersonal disability. WHODAS-II – Adaptive domain significantly positively correlated with WHODAS-II – Interpersonal domain, and significantly negatively correlated with RSES – Adaptive domain and RSES – Interpersonal domain, such that greater disability in adaptive functioning was significantly related to greater disability in interpersonal functioning and lower adaptive and interpersonal self-efficacy. WHODAS-II – Interpersonal domain significantly negatively correlated with RSES – Adaptive domain and RSES – Interpersonal domain, such that greater interpersonal disability was significantly related to lower adaptive and interpersonal self-efficacy.

A Bonferroni correction was applied, such that social competence (SSPA Accuracy) and functional disability (WHODAS-II) were classified as separate families. This correction was not applied to bivariate correlations including UPSA Accuracy since this variable did not significantly correlate with any other variable. The adjusted critical $p$-value for the correlations between SSPA Accuracy and the remaining variables was $0.05/4 = 0.013$. The adjusted critical $p$-value for the correlations between the two domains of WHODAS-II and the remaining variables was $0.05/5 = 0.010$. After applying this correction, all significant correlations remained as such, except for the correlation between WHODAS-II – Adaptive domain and RSES – Interpersonal domain.

**Hierarchical Regressions**

To address the objective of determining whether self-efficacy accounts for discrepancy between competence and performance in depression, hierarchical regression was performed in the depressed group. First, a hierarchical regression was conducted in the interpersonal domain (see Table 6 for correlations between the interpersonal competence-performance residual and variables considered for the model) to determine the independent predictive strength of interpersonal self-efficacy on the competence-performance discrepancy (i.e., the residual that remains after regressing SSPA Accuracy onto WHODAS-II – Interpersonal domain), after accounting for depression severity.

The regression equation for the interpersonal discrepancy was significant with BDI-II entering first, $[F(1,40) = 9.24, p = .004, R^2\Delta= .188]$ and RSES – Interpersonal domain entering next, $[F(2,39) =$
6.01, \( p = .005, R^2\Delta = .048 \). These steps remained significant after Bonferroni adjustment (corrected \( p \)-value = .05/2 = .025). However, once RSES – Interpersonal domain was entered in the second step, the beta coefficients for BDI-II and RSES – Interpersonal domain became non-significant (Table 7), suggesting that the addition of a second variable in the regression equation did not add much value. For exploratory purposes, BDI-II and RSES – Interpersonal domain were entered into the equation in the reverse order. A similar pattern in the regression equation emerged with RSES – Interpersonal domain entered first, \( F(1,40) = 8.93, p = .005, R^2\Delta = .183 \) and BDI-II entered second \( F(2,39) = 6.01, p = .005, R^2\Delta = .053 \) (see Table 7). Tolerance and Variance Inflation Factor (VIF) values were all within acceptable range (i.e., VIF lower than 10, Tolerance greater than .2); therefore, multicollinearity was not a concern.

Since SIAS significantly correlated with the interpersonal discrepancy, it was entered into the equation in a separate analysis to determine the predictive strength of social anxiety on the competence-performance discrepancy after accounting for depression. Self-efficacy (RSES – Interpersonal domain) was entered third, to determine whether remaining variance could be accounted for in part by self-efficacy for social behaviours. When SIAS was entered into the regression equation for interpersonal discrepancy, the equation was significant with BDI-II entering first, \( F(1,40) = 9.24, p = .004, R^2\Delta = .188 \), SIAS entering second, \( F(2,39) = 5.42, p = .008, R^2\Delta = .030 \), and RSES – Interpersonal domain entered third, \( F(3,38) = 3.95, p = .015, R^2\Delta = .020 \) (see Table 7). These steps remained significant after Bonferroni adjustment (corrected \( p \)-value = 0.05/3 = .017). Tolerance and VIF values were all within acceptable range. Similar to the two-step regression equation above, once the second and third steps (SIAS and RSES – Interpersonal domain, respectively) were entered after the first step (BDI-II), the beta coefficients for BDI-II, SIAS, and RSES – Interpersonal domain did not reach statistical significance.
Table 6. Correlations between variables in the interpersonal domain hierarchical regression in the depression group

<table>
<thead>
<tr>
<th></th>
<th>BDI-II</th>
<th>SIAS</th>
<th>SHAPS</th>
<th>RSES (Interpersonal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpersonal Discrepancy a</td>
<td>.433</td>
<td>.396</td>
<td>.102</td>
<td>-.427</td>
</tr>
<tr>
<td></td>
<td>(p = .004)</td>
<td>(p = .009)</td>
<td>(p = .519)</td>
<td>(p = .005)</td>
</tr>
</tbody>
</table>

a The interpersonal discrepancy is the residual that remains after regressing SSPA Accuracy onto WHODAS-II – Interpersonal domain.

Note: With Bonferroni correction applied, the adjusted critical p-value for the correlations between interpersonal discrepancy and each of BDI-II, SIAS, SHAPS, and RSES (Interpersonal) was .05/4 = .013. The correlations between the interpersonal discrepancy and BDI-II, SIAS, and RSES (Interpersonal) remain significant.

Table 7. Regression coefficients for interpersonal discrepancy regression models in the depression group

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
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</thead>
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<td>Interpersonal Discrepancy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 1 BDI-II</td>
<td>.04</td>
<td>.01</td>
<td>.43</td>
<td>3.04</td>
<td>.004</td>
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<tr>
<td>Model 2 BDI-II</td>
<td>.02</td>
<td>.01</td>
<td>.28</td>
<td>1.65</td>
<td>.108</td>
</tr>
<tr>
<td>RSES – Interpersonal domain</td>
<td>-.03</td>
<td>.02</td>
<td>-.27</td>
<td>-1.57</td>
<td>.125</td>
</tr>
<tr>
<td>Interpersonal Discrepancy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 1 RSES – Interpersonal domain</td>
<td>-.04</td>
<td>.01</td>
<td>-.43</td>
<td>-2.99</td>
<td>.005</td>
</tr>
<tr>
<td>Model 2 RSES – Interpersonal domain</td>
<td>-.03</td>
<td>.02</td>
<td>-.27</td>
<td>-1.57</td>
<td>.125</td>
</tr>
<tr>
<td>BDI-II</td>
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<td>.01</td>
<td>.28</td>
<td>1.65</td>
<td>.108</td>
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<td>Interpersonal Discrepancy including SIAS</td>
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<tr>
<td>Model 1 BDI-II</td>
<td>.04</td>
<td>.01</td>
<td>.43</td>
<td>3.04</td>
<td>.004</td>
</tr>
<tr>
<td>Model 2 BDI-II</td>
<td>.03</td>
<td>.01</td>
<td>.31</td>
<td>1.74</td>
<td>.090</td>
</tr>
<tr>
<td>SIAS</td>
<td>.01</td>
<td>.01</td>
<td>.22</td>
<td>1.22</td>
<td>.229</td>
</tr>
<tr>
<td>Model 3 BDI-II</td>
<td>.02</td>
<td>.02</td>
<td>.26</td>
<td>1.46</td>
<td>.153</td>
</tr>
<tr>
<td>SIAS</td>
<td>.004</td>
<td>.01</td>
<td>.07</td>
<td>.32</td>
<td>.755</td>
</tr>
<tr>
<td>RSES – Interpersonal domain</td>
<td>-.02</td>
<td>.02</td>
<td>-.22</td>
<td>-1.00</td>
<td>.323</td>
</tr>
</tbody>
</table>

A similar analysis in the adaptive domain of functioning was not able to be performed since the correlation between adaptive competence (UPSA Accuracy) and real-world functioning (WHODAS-II – Adaptive domain) was not significant (r = .087, p = .582). Instead, hierarchical regression was performed.
with adaptive functional disability (WHODAS-II – Adaptive domain) as the outcome to identify predictors of functional deficit in adaptive behaviours. A parallel analysis was conducted in interpersonal functioning. In each regression, variables that were entered into the model were those that correlated with the respective outcome measure of functional disability (see Tables 4-5).

Predictors of Functioning

Adaptive Domain

To determine whether adaptive self-efficacy predicts adaptive disability after accounting for depressive symptoms, BDI-II was entered into the first step and adaptive self-efficacy (RSES – Adaptive domain) entered into the second step. SHAPS and SIAS were not significantly correlated with WHODAS-II – Adaptive domain, thus they were not entered. The equation was significant with BDI-II entered first \([F(1,40) = 27.25, p < .001, R^2\Delta = .405]\) and RSES – Adaptive entered next \([F(2,39) = 17.93, p < .001, R^2\Delta = .074]\) (see Table 8). These steps remained significant after Bonferroni adjustment (corrected \(p\)-value = .05/2 = .025). Tolerance and VIF values were all within acceptable range.

Table 8. Regression coefficients for adaptive functioning regression models in the depression group

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptive domain (WHODAS-II disability)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BDI-II</td>
<td>.43</td>
<td>.08</td>
<td>.64</td>
<td>5.22</td>
<td>.000</td>
</tr>
<tr>
<td>Model 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BDI-II</td>
<td>.31</td>
<td>.09</td>
<td>.46</td>
<td>3.32</td>
<td>.002</td>
</tr>
<tr>
<td>RSES – Adaptive domain</td>
<td>-.25</td>
<td>.11</td>
<td>-.33</td>
<td>-2.35</td>
<td>.024</td>
</tr>
</tbody>
</table>

Interpersonal Domain

To determine whether interpersonal self-efficacy predicts interpersonal disability above and beyond symptoms a hierarchical regression was conducted on the dependent variable of WHODAS-II – Interpersonal domain, with BDI-II entered first, SHAPS and SIAS entered in a second step (stepwise), and interpersonal self-efficacy (RSES – Interpersonal domain) entered last. SHAPS and SIAS were forced out of the regression, resulting in a significant equation with BDI-II entered first \([F(1,40) = 21.12, p < .001, R^2\Delta = .397]\) and RSES – Interpersonal entered last \([F(2,38) = 7.83, p < .001, R^2\Delta = .192]\) (see Table 9). These steps remained significant after Bonferroni adjustment (corrected \(p\)-value = .05/2 = .025). Tolerance and VIF values were all within acceptable range.
.001, \( R^2 \Delta = .346 \) and RSES – Interpersonal domain entered next \( [F(2,39) = 15.57, p < .001, R^2 \Delta = .098] \) (see Table 9). These steps remained significant after Bonferroni adjustment (corrected \( p \)-value = .05/2 = .025). Tolerance and VIF values were all within acceptable range.

Table 9. Regression coefficients for interpersonal functioning regression models in the depression group

<table>
<thead>
<tr>
<th>Interpersonal domain (WHODAS-II disability)</th>
<th>( B )</th>
<th>SE</th>
<th>Beta</th>
<th>( t )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1 BDI-II</td>
<td>.21</td>
<td>.05</td>
<td>.59</td>
<td>4.60</td>
<td>.000</td>
</tr>
<tr>
<td>Model 2 BDI-II</td>
<td>.13</td>
<td>.05</td>
<td>.37</td>
<td>2.54</td>
<td>.015</td>
</tr>
<tr>
<td>RSES – Interpersonal domain</td>
<td>-.16</td>
<td>.06</td>
<td>-.38</td>
<td>-2.63</td>
<td>.012</td>
</tr>
</tbody>
</table>

**Self-efficacy Specificity**

Fisher’s r-to-z test was conducted to determine whether adaptive self-efficacy (RSES – Adaptive domain) correlates significantly more strongly with adaptive than interpersonal functioning (WHODAS-II), and if interpersonal self-efficacy (RSES – Interpersonal domain) correlates significantly more strongly with interpersonal than adaptive functioning (correlations can be found in Table 5). This was found not to be the case. Adaptive self-efficacy did not have a significantly higher correlation with adaptive than interpersonal disability, \( z = -.80, p = .424 \) (two-tailed). Similarly, interpersonal self-efficacy did not have a significantly higher correlation with interpersonal than adaptive disability, \( z = 1.29, p = .197 \) (two-tailed).
Chapter 4

Discussion

The current study was the first of its kind to examine the role of self-efficacy in the relationship between competence and real-world functioning in depressed individuals, as well as contextualize the impairment of a depressed sample, relative to a comparison sample of healthy individuals, on measures of adaptive and interpersonal competence, real world functional disability, and self-efficacy. This study investigated whether self-efficacy helped to explain the gap between ability and everyday performance in depression, above and beyond symptoms of depression, and to add to the literature on predictors of functional impairment in depressed individuals.

Impairment of Depressed Relative to Healthy Individuals

In line with the hypotheses, examination of the performance of depressed individuals relative to healthy participants suggested that individuals with unipolar depression show impairments in adaptive and interpersonal competence as well as functioning, and lower adaptive and interpersonal self-efficacy.

Adaptive and Interpersonal Competence in Depression

This study provided some of the first data on measures of competence in depression, using tools initially developed and validated for severe mental illness, mainly schizophrenia. The depressed individuals performed significantly worse than healthy participants; however, their performance was not as low as has been reported in investigations with schizophrenia (Leifker et al., 2010; Mausbach et al., 2007; Patterson et al, 2001b). Indeed, schizophrenia is a condition with significant deficits in numerous areas of functioning and cognition and a poorer premorbid course of illness that obstructs acquisition of skills; therefore, impaired competence may be more easily detected on the UPSA.

Interestingly, the domain of adaptive competence from the UPSA with one of the largest effect sizes was instrumental communication. Taken together with significantly poorer interpersonal competence, it is possible that individuals with depression show the most robust skill deficit in their ability to engage socially with others. Indeed, Cresswell and colleagues (1992) commented that a reduced
ability to cope with stresses and daily life demands accompanies mental illness, which can affect critical social skills needed to establish and maintain mutually rewarding social relationships and transactions with others. People who judge themselves to be socially efficacious seek out and cultivate social relationships that provide models on how to manage difficult situations, soften the adverse effects of chronic stressors, and bring positivity and satisfaction to people’s lives. As a result of more withdrawal and disengagement from others, those with depression may lack the opportunity to feel and give affection and overall be less likely to experience effective social interactions with others.

The importance of social interactions has been highlighted in prior research that suggests that perceived social support fosters feelings of belonging, security, and a sense of control over the environment, which may improve confidence in one’s own worth and abilities, and thus protect against negative psychological outcomes (Cohen & Hoberman, 1983; Kawachi & Berkman, 2001). A recent investigation (Lichtenstein et al., 2015) exploring the role of social support in cancer patients’ experience of depression has suggested that social support – particularly intimate partner support – is an important factor to be addressed in depression due to a moderate negative correlation (Spearman’s rho = -.42) between this form of support and depression status on the Patient Health Questionnaire (PHQ; Huang, Chung, Kroenke, Delucchi, & Spitzer, 2006). Lichtenstein et al. (2015) also found that social undermining (i.e., perceived negative evaluations of an individual that impede their progress toward achieving their goals) correlates with increased depression scores, suggesting that feeling unsupported and negatively evaluated is a risk factor for depressive symptoms.

Adaptive and Interpersonal Real-world Functioning in Depression

Depressed participants in the current study experienced mild to moderate impairment as a group in adaptive and interpersonal functioning as measured by the WHODAS-II. This is comparable to existing findings in the literature. For example, Judd et al. (2008) employed a retrospective clinician-rated semi-structured interview (the Longitudinal Interval Follow-up – Range of Impaired Functioning Tool [LIFE-RIFT; Leon et al., 1999], which measures psychosocial impairment due to psychopathology in the participant’s role functioning [work, school, household duties], interpersonal relationships [spouse/mate,
children, other relatives, friends], limitations in recreation/hobbies, and overall negative subjective satisfaction) as a measure of functioning in a sample of patients with unipolar depression. These individuals were experiencing mild functional impairments in recreation, work and household duties, school, and relationships with others. Godard and colleagues (2011), who employed the same interview, found moderate to severe impairments in work and home functioning roles, as well as mild to moderate impairments in relationships. Patients not only neglected housework, as was expected, they also reported more disability related to work. Their relations with family members and friends were characterized by conflicts or limited contacts. Similar to the present study, participants with depression reported significantly higher impairment in work and home duties, as well as more hindered social functioning.

**Adaptive and Interpersonal Self-efficacy in Depression**

As anticipated the depressed group reported significantly lower self-efficacy in adaptive and interpersonal behaviours than healthy individuals. Bandura (1994) explained that self-efficacy beliefs influence an individual’s thought patterns and emotional reactions in a way that positive mood enhances an individual’s sense of self-efficacy while despondent mood diminishes it. Negative self-perceptions are both a cause and maintenance factor in depression, and the development of depression is related to dejected ruminative thoughts in conjunction with low sense of efficacy to control those thoughts (Bandura, 1994). Depressed individuals in this study, therefore, had poorer self-efficacious beliefs about their abilities to perform behaviours conducive to necessary daily activities and successful social interactions.

**The Relationships Between Symptoms, Competence and Disability in Depression**

Consistent with the literature, greater depressive symptomatology was associated with more disability in adaptive and interpersonal behaviours; however, at the competence level, depression was only associated with interpersonal competence. As proxy measures of disability, competence should presumably be affected by depressive symptoms; however, relationships were not observed with the UPSA.
The average level of anhedonia observed in the present sample was comparable to published samples with MDD (e.g., mean SHAPS of 4.0 and 3.1 in Nakonezny et al. [2010, 2015], respectively). In the current investigation, anhedonia was consistently found to be significantly related to interpersonal, but not adaptive variables (i.e., the SHAPS was significantly negatively correlated with interpersonal competence and self-efficacy, and positively correlated with real-world interpersonal functioning). Thus, anhedonia was related to impaired engagement in, and interaction with, others (as measured by the WHODAS-II – Interpersonal domain), but not with impaired performance of household and occupational/student roles (as measured by the WHODAS-II – Adaptive domain). This latter finding is in contrast with previous work in MDD finding that greater anhedonia (measured using the Montgomery-Asberg Depression Rating Scale; MADRS; Montgomery & Asberg, 1979) predicted disability (measured using the Sheehan Disability Scale; Sheehan et al., 1996) and was related to unemployment (Rizvi et al., 2015). Thus, although the present findings suggest that in depression anhedonia may more strongly underlie social isolation than impaired occupational and household functioning, claims of the relationship of anhedonic symptoms with functioning are cautioned, particularly since the current sample displayed a limited range of anhedonic symptoms.

Higher social anxiety, as expected, significantly correlated with lower interpersonal competence and higher interpersonal disability. This is not surprising given that depression and social phobias are among the most common psychiatric disorders, with approximately 27% of individuals with lifetime depression also having comorbid lifetime social phobia (Kessler, Stang, Wittchen, Stein, & Walters, 1999). Patients with comorbid depression and anxiety have fewer social interactions and demonstrate greater social dysfunction relative to those with a singular psychiatric diagnosis (Gorman, 1997); thus, the impact of social phobia on social skills and engagement with others is significant.

Taken together, the symptoms measured in the present study were found to more consistently relate to variables of the interpersonal, as opposed to adaptive domain, with only depressive symptomatology significantly correlating with disability in adaptive behaviours. While not surprising that social anxiety correlated with interpersonal but not adaptive competence and functioning, the fact that the
same pattern was observed between functioning and anhedonic symptoms is a curious finding, because it may suggest that loss of pleasure – a characteristic symptom of depression (and in fact one of the two symptoms necessary for a diagnosis of MDD) – may more accurately be a loss of pleasure received from social interactions and less so from everyday adaptive activities. Social interaction is both rewarding and associated with a high level of affiliation, and the present results suggest that having greater loss of pleasure significantly relates to poorer social skills, greater social disability and lower social self-efficacy. This curious finding might be an indication that the scale used to measure anhedonia (SHAPS) may not provide an adequate measure of loss of pleasure related to household and occupational/student roles. Indeed, the SHAPS samples loss of pleasure related to hobbies, pastimes, and hedonic experiences (e.g., “I would enjoy my favourite television or radio program”, “I would enjoy a warm bath or refreshing shower”, “I would enjoy reading a book, magazine or newspaper”) as well as social encounters (e.g., “I would enjoy being with my family or close friends”); however, the items do not directly correspond to adaptive functioning. The three anhedonia scales most commonly used in depression research are the SHAPS, the Fawcett-Clark Pleasure Capacity Scale (FCPS; Fawcett, Clark, Scheftner, & Gibbons, 1983) and the Revised Chapman Physical Anhedonia Scale (CPAS; Chapman, Chapman, & Raulin, 1979). The FCPS is a questionnaire that asks participants to rate imagined hedonic reactions to hypothetical pleasurable situations (e.g., “You sit watching a beautiful sunset in an isolated, untouched part of the world”); whereas the CPAS is a questionnaire that asks participants to respond true or false to self-statements about their typical feelings about normally pleasurable stimuli and activities in the domains of activities and hobbies, sensory experiences, pastimes, social interaction and food/drink (e.g., “I have usually found love making to be intensely pleasurable”). Together, these commonly used anhedonia scales do not seem to sample pleasure derived from adaptive behaviours as measured using the WHODAS-II. Future work might explore the development of scales of anhedonia that independently assess pleasure derived from adaptive and interpersonal activities, and that map onto respective domains of published measures of functioning.
The Role of Self-efficacy in Depressed Individuals’ Competence-performance Gap

As hypothesized, self-efficacy accounted for a significant proportion of variance between competence and performance beyond depressive symptoms; however, investigation of this relationship was only permitted in the interpersonal domain of functioning since a relationship between adaptive competence and performance was not observed, thwarting a meaningful discrepancy between these variables (i.e., residual) for the adaptive domain. It is surprising that a significant correlation between adaptive competence and real-world functioning was not observed in the current depressed sample, as prior research using the UPSA reported significant moderate correlation with real-world functioning in schizophrenia (Keefe et al., 2006). It is possible that the real-world measure of functioning used by Keefe and colleagues (2006), the Independent Living Skills Inventory (ILSI; Menditto et al., 1999), more closely overlaps with the UPSA. Indeed, the ILSI is an assessment instrument that measures individuals’ ability to perform a broad range of skills important for successful community living (e.g., basic skills such as remembering a personal phone number, home maintenance, money management, cooking, medication management). On the ILSI, the respondent rates the extent to which he or she is able to perform each skill, as well as the extent of assistance or guidance required. In this way, the ILSI measures extent of skills or competence as opposed to actual disability in functioning. Despite this, the UPSA has been shown previously to have good criterion validity with a number of real-world outcome measures. For example, Twamley and colleagues (2002) discovered that level of residential independence was significantly related to participants’ total UPSA scores in schizophrenia; Mausbach et al. (2008) predicted current residential status of adults with schizophrenia or schizoaffective disorder using their total UPSA scores; and Cardenas et al. (2008) found that higher UPSA scores correlated with ability of older individuals with schizophrenia to engage in various activities including working for pay, volunteer work, and attending school. One reason that the adaptive competence and adaptive functioning measures used in the present study did not significantly correlate could be the result of a poor overlap between them, such that they may not be measuring the same skills and performance of those skills in the real world. The UPSA is a tool that assesses skills that are important for everyday functioning: financial, instrumental
communication, comprehension and planning, and ability to understand and use a transportation schedule. In contrast, in the WHODAS-II – Adaptive domain the participant is asked to rate how much difficulty was faced in the past month while performing household and work/school activities (e.g., difficulty in getting all the work done that needed to be completed, difficulty in getting household or work tasks done well). While abilities measured by the UPSA (e.g., financial skills, planning, using communication for specific purpose) are indeed relevant for household and workplace functioning, the measure of adaptive real-world performance used may simply not be an analogous measure to adaptive competence as measured by the UPSA.

While interpersonal self-efficacy accounted for a significant proportion of variance between interpersonal competence and performance beyond depressive symptoms, once self-efficacy was entered into a hierarchical regression predicting interpersonal competence-performance discrepancy after accounting for depressive symptoms, neither the depressive symptoms nor interpersonal self-efficacy retained significant coefficients in the regression equation. This suggests that the addition of a second variable into the equation did not add much predictive value despite this variable accounting for a significant proportion of variance in the discrepancy. When a hierarchical regression was run with interpersonal self-efficacy entered first and depressive symptoms second, the same pattern emerged: while interpersonal self-efficacy contributed significantly to the equation, the addition of a second variable did not add predictive value. While this finding may be due to low power, a possible interpretation is that when trying to best explain why individuals with depression may underperform in the real world relative to their ability, either interpersonal self-efficacy or depressive symptoms, independently, might significantly predict the underperformance, but combining these variables together does not result in significantly greater predictive capacity. However, interpersonal self-efficacy accounts for a significant proportion of the variance in the interpersonal competence-performance discrepancy above and beyond depressive symptoms. The relationship of self-efficacy in the competence-performance gap in adaptive functioning requires further investigation, perhaps with different instruments that allow a significant correlation between measured competence and real-world functioning.
The significant role of interpersonal self-efficacy as a factor that helps to account for depressed individuals’ social underperformance in the real world relative to their competence is fitting with Bandura’s (1994) explanation that there is a marked difference between possessing knowledge and skills and being able to use those skills well in taxing situations. Not only is the skill to complete a task important in personal accomplishments, but so too are self-efficacious beliefs to use these skills well. Of course, depressive symptoms and self-efficacy are not the only factors that affect performance relative to competence in depression, as there is still a proportion of variance that remains to be accounted for. With much variance unexplained, future work is needed to gain a clearer understanding of this gap. However, the present findings propose that while two depressed individuals may have the same knowledge and skills, their performance may differ depending on fluctuations in their self-efficacy. Indeed, Trower, O’Mahoney and Dryden (1982) suggest that individuals who experience dysphoria or depression may not necessarily lack social skills, but due to their negative performance expectancies and symptoms, may fail to use the skills that they have in their behavioural repertoire. When faced with tasks perceived as challenging, those with low self-efficacy might dwell on personal deficiencies and adverse outcomes, which could affect perseverance in the face of difficulties. In contrast, a strong sense of self-efficacy may foster an individual’s interest and engrossment in activities, as well as approach, rather than avoidance tendencies when faced with difficult challenges, because these individuals might be more likely to have the assurance that they can exercise control over threatening situations. This self-efficacious outlook, Bandura (1994) explains, produces personal accomplishments and lowers vulnerability to depression. In the context of functioning, the present findings support that self-efficacy is a significant factor in the relationship between competence and functioning: with low social self-efficacious beliefs, depressed individuals may underestimate their ability to perform interpersonal actions, and as a consequence, withdraw or disengage from performing them in the real world.

**Predicting Functional Disability in Depression**

Self-efficacy significantly predicted functional disability even after accounting for depressive symptoms, both in adaptive and interpersonal functioning. Other symptoms (anhedonia and social
anxiety) did not add predictive strength to either model. Theoretically, it is not surprising that self-efficacy predicted real-world functioning in depression. People who are sad or depressed attend to negative aspects of their experience more than non-depressed people do (Bower, 1983; Lishman, 1972; Lloyd & Lishman, 1975), and they evaluate their own performance more negatively (Forgas, Bower, & Krantz, 1984; Lobitz & Post, 1979). Lewinsohn (1974) explains that from a behavioural perspective, depressive social functioning is characterized by reduced skills, resulting in low positive reinforcement in interpersonal relationships, and eventual social withdrawal. In depression and dysthymia, negative cognitions about low capabilities have potentially been rehearsed so frequently, and the negatively biased judgments of depressed individuals may well affect their engagement and performance in daily activities. Indeed, negative cognitive style, considered a cognitive vulnerability to depression described in hopelessness theory has been thought to lead vulnerable individuals to have a negative perception of their self-worth (Abramson, Metalsky, & Alloy, 1989). Buist-Bouwman and colleagues (2008) found that negative self-evaluation of individuals in a major depressive episode is related to their impaired role functioning at home and in paid employment as measured using items from the WHODAS-II. The present results not only extend these findings to interpersonal disability, they support a predictive relationship between depressed individuals’ beliefs in their ability to perform adaptive and interpersonal behaviours and their real-world functional disability in these domains.

**Specificity of Depressed Individuals’ Self-efficacy**

The specificity of self-efficacy was explored in this investigation. While the strength of correlation between domain specific self-efficacy and functioning (e.g., interpersonal self-efficacy and interpersonal functional disability) was greater than for cross-domain correlations (e.g., interpersonal self-efficacy and adaptive functional disability), the strength of association was not significantly greater for domain-specific relationships between self-efficacy and functioning. Adaptive self-efficacy was not more highly correlated with adaptive than interpersonal disability nor was interpersonal self-efficacy significantly higher correlated with interpersonal than adaptive disability. This is compatible with the argument of Eccles and Wigfield (2002) that efficacy beliefs need not be specific to the tasks being
performed in order to predict real-world performance. While an interpretation of these results may be that improving self-efficacy more generally might assist in the enhancement of self-belief in more domain-specific activities, further work with larger and more diverse samples is necessary to definitively determine whether there is indeed specificity in the relationships between domain-specific self-efficacy and functioning.

**Limitations and Future Directions**

The current study produced novel findings regarding self-efficacy and functioning in depression. Particularly, depressed individuals showed significant impairments on measures of capacity; however, these impairments were not as large as those in their everyday functioning, and self-efficacy may aid in understanding this gap. Furthermore, while improvement in capacity may be necessary for improved functioning in depression, it might not be sufficient when self-efficacious beliefs are low. This has particular relevance in clinical work and research designed to improve functioning: clinicians and researchers should consider assessment of self-efficacy along with capacity when considering the individual’s ability to function in the real world.

As this study has pioneered some of the first data regarding the relationships among competence, self-efficacy, symptoms and functional outcomes in depression, it has brought to light ideas to take forth into future research. It must be acknowledged that due to the scant literature in this area, the theory that informed the hypotheses of this investigation stemmed from research in another psychiatric diagnosis: schizophrenia. Literature in schizophrenia has shown large impairment on measures of competence (e.g., 59 – 70% accuracy on adaptive and interpersonal competence; Patterson et al., 2001a, 2001b; Mausbach et al., 2007). Here, the depressed sample was significantly impaired relative to healthy individuals (performing at 85 and 86% accuracy on adaptive and interpersonal competence measures, respectively); however, their accuracy was not as poor as reported in schizophrenia. Interestingly, this suggests that despite being impaired relative to healthy participants, depression may constitute a mental illness whereby individuals have only mild skill deficits; however, they do not make optimal use of their skills in real-world functioning. Thus, while life skills are an important remediation focus in depression, so too is a
critical focus of treatment on clients’ self-efficacy to enhance their likelihood of utilizing their skills in their everyday functioning.

An additional limitation to this study concerns the measure of real-world behaviour. There is no agreed upon gold standard measure of gauging performance in the real world in depression. The instrument used in the present study was the WHODAS-II, an interview that is administered by an assessor to a participant who reports the severity of impairment that he or she faced concerning a number of functional behaviours in the past month. As such, in spite of being an interview, this measure is susceptible to biases in self-report, especially since the negative attributional style of depressed thinking can affect recall of autobiographical memory (Kuyken & Dalgleish, 2011), influence more negative assertions about functional impairment (Geisser, Roth, Theisen, Robinson, & Riley, 2000), and is related to self-evaluations that are more negative than those of non-depressed participants in the absence of differences in actual performance (Lobitz & Post, 1979; Smolen, 1978). Future work would likely benefit from objective assessment of observed behaviour and usage of instruments less susceptible to self-report biases (e.g., third party report, observational methods), though these come with pragmatic issues related to burden. In addition to the subjectivity inherent in this measure, the WHODAS-II domains do not consist of a large number of items, thereby limiting the breadth of functional activities that are sampled. Future research should employ measures that provide a more thorough sampling of the functional behaviours of interest.

Another limitation of this study is its cross-sectional design which precludes the ability to interpret causality in the results. To determine the causality of the relationships presented here, future research might employ a longitudinal or experimental design, in which self-efficacy is manipulated in the context of stable capacity to determine if changes in self-efficacy produce changes in functional outcomes. Prior research has used experimental design to manipulate participants’ self-efficacy, by providing computer-generated false feedback relative to their performance (e.g., inducing higher self-efficacy through congratulatory praise and feedback that the individual’s performance was high relative to a normative sample, or inducing lower self-efficacy by indicating that the individual’s performance was
much lower than their peer group; Marquez, Jerome, McAuley, Snook, & Canaklisova, 2002). Using this strategy in a sample of healthy individuals, Marquez et al. (2002) found that increasing participants’ self-efficacy for exercising ability was related to a reduction in their state anxiety responses. To better gauge directions of causality between self-efficacy, depressive symptomatology, and performance in depression, future research might apply a computerized experimental paradigm to manipulate self-efficacy in a depressed sample, and measure the effect of this change on changes in task performance and reported symptomatology.

Further, capacity was assessed in the current study by using measures that have not been extensively used in depressed samples and were created for and validated on samples with severe mental illness (e.g., schizophrenia). The authors of these measures of competence have noted the importance of investigating the utility of them in other psychiatric samples (e.g., depression, anxiety, Alzheimer’s disease), and the present study has provided an exploration of the utility of the UPSA and SSPA in a depressed sample. Since the usage of the UPSA and SSPA in depressed samples is in its infancy, it will be important for future investigations to employ them in order to further determine how useful they are in this condition. For example, utility of the SSPA and UPSA in characterizing depression might also be derived from the response of these measures to treatment. If they are able to gauge improvements in depression over course of treatment, this would support their sensitivity to impairment and recovery in treating depression. In a cognitive remediation behavioural intervention, individuals with severe mental illness (psychotic and mood disorders) showed significant improvement on the UPSA after treatment (Bowie et al., 2016). Further, improvements on the UPSA in people with MDD after an 8-week treatment with Vortioxetine, an antidepressant, have been observed (Jacobson et al., 2015; Harvey et al., 2015). Thus, UPSA is reportedly sensitive to treatment effects in severe mental illness. Future treatment-based work should independently explore depressed samples to definitely answer whether these measures of competence are reliable and useful tools in this particular psychiatric illness.

In addition, it will be important to monitor the utility of the UPSA not only in depressed samples, but other psychiatric groups relative to healthy individuals to investigate the relevance of this tool as
technological advances continue. For example, with the advancement of online access to bus route and trip planning resources, it is not as necessary for people to read and interpret a traditional bus schedule as was the case before, which may outdate the transportation domain of the UPSA. Further, the instrumental communication domain requires the participant to call directory assistance to find a phone number, which is no longer as important of a skill given that the Internet provides quick and easy access to contact information. Updated domains that integrate more modern methods of completing everyday tasks (e.g., writing an email instead of leaving a voicemail or using online map systems to plan the route to a destination instead of a traditional printed bus schedule) may need to be developed in order to maintain relevance as a measure of capacity.

**Implications**

The current study revealed several findings that are important in characterizing competence, functioning, and self-efficacy in depression and looking towards functional improvement. Depressed individuals’ adaptive competence did not significantly differ from healthy individuals’; however, when the depressed group was restricted to individuals who had achieved the same range of education as the healthy individuals, significant impairment of the depressed sample in adaptive competence was present. Further, participants who were depressed had significantly poorer social competence than healthy individuals. While this depressed sample did not score as low in accuracy on adaptive and interpersonal competence as has been observed in schizophrenia samples, their impairment relative to healthy individuals suggests that reduced adaptive and social competence might be transdiagnostic factors among these mental illnesses.

The present findings are very helpful in informing treatment aimed at the functional recovery of those with depression, whereby competence impairments may be important targets of treatment directed at translating skills into everyday functioning, but these efforts are likely to require accompaniment of efforts tailored to addressing self-efficacious beliefs in this diagnostic group. While evidence for a significant role of self-efficacy in the discrepancy between competence and performance was only able to be discovered in the interpersonal domain in the present investigation, it was observed that adaptive self-
efficacy significantly predicted adaptive functioning; therefore, it does appear to be an influential factor in adaptive functional performance as well. Thus, the significance of strengthening psychological resources such as self-efficacy should be a treatment focus for depressed individuals.

A common and theory-consistent strategy for motivating clients with Cognitive Behavioural Therapy (CBT) is to focus on expectancies, or the client’s confidence and optimism about the effectiveness of counseling and his or her own capacity to change (Ryan, Lynch, Vansteenkiste, & Deci, 2011). Indeed, self-efficacy is explained to be a key factor explaining treatment gains and behavioural change (Clarke et al., 2014). Insofar as clients lack the belief that they are capable of successfully achieving an outcome, they are unlikely to put effort into behavioural change. Further, self-efficacy has been found to be a strong mediator of the relationship between depressive symptoms and adherence to health recommendations and treatment (Tovar, Rayens, Gokun, & Clark, 2015). Related to this, Westra, Dozois, and Marcus (2007) observed that expectancy predicted early compliance with homework in CBT, which mediated the relationships between expectancy and symptom change in individuals with anxiety. Therefore, treatment-related self-efficacious and expectancy beliefs are purportedly important for sustained involvement, motivation, and outcomes of treatment. In light of present findings, self-efficacy might be further targeted in treatment to enhance engagement with the environment, working particularly to lessen functional disability in depressed individuals. Self-efficacious beliefs might be targeted though cognitive-focused therapy to identify the client’s maladaptive beliefs about their abilities to complete tasks, in an effort to change those specific interpretations and beliefs, and subsequently testing them empirically by trying out new cognitive frameworks in the context of daily life. This might take the form of behavioural experiments designed to engage in activities that clients may not experience the self-efficacious beliefs to complete. In this process, the therapist should highlight and respect the client’s autonomy to make or not make choices and complete challenging behaviours (Ryan et al., 2011), and importantly, review the pros and cons of engaging in behaviours that may seem challenging, while setting realistic goals for the direction of greater and more positive engagement of the client in adaptive and social everyday activities. The current findings suggest that within this process, tracking the client’s
perceived self-efficacy may be an important factor in enhancing his or her functional performance and behavioural engagement with the real-world.

Wagner and King (2005) have commented on the importance of existential needs in individuals with mental illness. A sense of self-worth and meaning are often bypassed as more basic needs take precedence for those with mental illness. Rutz (2003) advocates the role that community based mental health services can play in quality of life by providing services that promote social networks, psychological environment and existential identity at the home base. Psychosocial programs that raise clients’ sense of self-mastery can help them fulfill new and more desirable roles, thereby raising their psychological wellbeing and life satisfaction (Arns & Linnet, 1993; Corrigan & Buican, 1995). While individuals with depression may not always achieve complete symptom remission, the main goal of treatment should be to help the individual live with their condition at minimal personal cost and maximum benefit, particularly in terms of achieving an optimum level of functioning (Murphy & Murphy, 2006). By including self-efficacy measures and competence assessments to determine ability, treatment can be tailored to meet the needs of each individual and help to enhance the deployment of their available skills in the real world. In light of the findings from the current study, interventions concerned with level of self-efficacy will be important in helping depressed individuals lead more functional lives.
References


Appendix A Queen’s University Health Sciences & Affiliated Teaching Hospitals Research Ethics Board (HSREB) Approval of Study

QUEEN’S UNIVERSITY HEALTH SCIENCES & AFFILIATED TEACHING HOSPITALS RESEARCH ETHICS BOARD (HSREB)

HSREB Initial Ethics Clearance

July 21, 2015

Ms. Melissa Milanovic Department of Psychology Queen’s University

ROMEO/TRAQ #:6015623
Department Code: PSYC-162-15
Study Title: Self-efficacy in depression: Bridging the gap between competence and real-world functioning
Co-Investigators: Dr. C. Bowie, Miss A. Martin, Miss E. Ayukawa, Miss M. Cornett, Miss M. Borsuk-Gudz
Review Type: Delegated
Date Ethics Clearance Issued: July 21, 2015
Ethics Clearance Expiry Date: July 21, 2016

Dear Ms. Milanovic,

The Queen's University Health Sciences & Affiliated Teaching Hospitals Research Ethics Board (HSREB) has reviewed the application and granted ethics clearance for the documents listed below. Ethics clearance is granted until the expiration date noted above.

- Protocol
- Budget
- Advertisement
- Telephone Recruitment Script
- Clinician Information Sheet – Version: 22 May 2015
- Information/Consent Form

Documents Acknowledged: CORE Certificates (Milanovic, Martin, Ayukawa, Cornett, Borsuk-Gudz)
Amendments: No deviations from, or changes to the protocol should be initiated without prior written clearance of an appropriate amendment from the HSREB, except when necessary to eliminate immediate hazard(s) to study participants or when the change(s) involves only administrative or logistical aspects of the trial.

Renewals: Prior to the expiration of your ethics clearance you will be reminded to submit your renewal report through ROMEO. Any lapses in ethical clearance will be documented on the renewal form.

Completion/Termination: The HSREB must be notified of the completion or termination of this study through the completion of a renewal report in ROMEO.

Reporting of Serious Adverse Events: Any unexpected serious adverse event occurring locally must be reported within 2 working days or earlier if required by the study sponsor. All other serious adverse events must be reported within 15 days after becoming aware of the information.

Reporting of Complaints: Any complaints made by participants or persons acting on behalf of participants must be reported to the Research Ethics Board within 7 days of becoming aware of the complaint. Note: All documents supplied to participants must have the contact information for the Research Ethics Board.

Investigators please note that if your trial is registered by the sponsor, you must take responsibility to ensure that the registration information is accurate and complete.

Yours sincerely,

Chair, Health Sciences Research Ethics Board

The HSREB operates in compliance with, and is constituted in accordance with, the requirements of the TriCouncil Policy Statement: Ethical Conduct for Research Involving Humans (TCPS 2); the International Conference on Harmonisation Good Clinical Practice Consolidated Guideline (ICH GCP); Part C, Division 5 of the Food and Drug Regulations; Part 4 of the Natural Health Products Regulations; Part 3 of the Medical Devices Regulations, Canadian General Standards Board, and the provisions of the Ontario Personal Health Information Protection Act (PHIPA 2004) and its applicable regulations. The HSREB is qualified through the CTO REB Qualification Program and is registered with the U.S. Department of Health and Human Services (DHHS) Office for Human Research Protection (OHRP). Federalwide Assurance Number: FWA#:00004184, IRB#:00001173

HSREB members involved in the research project do not participate in the review, discussion or decision.