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INTRODUCTION

Schizophrenia, despite great efforts over the course of the last century, remains a largely enigmatic disorder. According to the National Institute for Mental Health (NIMH, 2010), approximately 1.1% of the general adult population is afflicted with schizophrenia, meaning an estimated 51 million people worldwide are currently living with the disorder. A study assessing public, private, and indirect health costs of schizophrenia found the estimated annual cost of the disorder in the United States to be $62.7 billion in 2002 (Wu et al., 2003). In light of the many advances made, these figures make clear the need for continued attention and dedication to the understanding of schizophrenia. Much of the mystery shrouding schizophrenia has been attributed to the difficulties with the ability of researchers to specify the fundamental nature of the disorder (Heinrichs, 1993). Though a biological model of etiology has been most dominant in the field for the last half-century, researchers have begun to see the complementary value of adopting a phenomenological approach in understanding schizophrenia (Dimaggio, Vanhuele, Lysaker, Carcione, & Nicolo 2009; Fisher, McCoy, Poole, & Vinogradov, 2008; Lallart. Lallart, & Jouvent, 2009; Lysaker & Lysaker, 2005). This approach shifts focus to improving our understanding of the subjective experiences of individuals with schizophrenia. Phenomenological researchers have begun to examine disturbances in an individual’s sense of self as
a feature associated with the disorder (Leube, Whitney, & Kircher, 2008; Giovanni &
Lysaker, 2007). More specifically, it has been postulated that selfdisturbance may be a
core feature of schizophrenia-spectrum disorders (Nelson, Fornito, et al., 2009), and that
this disturbance may be a phenotypic marker that is present even before the onset of
psychotic symptoms (Vollmer-Larsen, 2008). While this area of the literature continues
to expand, little has been done to examine the specificity of self-disturbance to
schizophrenia. Similarly, the relationship between a disrupted sense of self and specific
symptoms or phenomena associated with the disorder has not yet been investigated.

Historically, disturbed sense of self was more readily recognized as a core feature
of schizophrenia – dating as far back as Bleuler’s writings of “dementia praecox”
(1911/1950). As recently as the DSM-III, disturbance in the sense of self was included in
the diagnostic criteria for the disorder (American Psychiatric Association [DSM-III],
1980). However, due to issues surrounding the vagueness of the term “self” and a
perceived lack of clinical utility surrounding the concept of a disrupted sense of self, this
item was no longer present in DSM-IV (American Psychiatric Association [DSM-IV],
2000). However, several schizophrenia researchers have criticized what they call an
“overreliance on a purely operational approach” (Sass & Parnas, 2003) in the form of
diagnostic criteria and conceptualization that may overemphasize reliability at the
expense of validity. While such tools are clearly useful in some aspects of understanding
psychopathology, the subjective concomitants of psychological disorders are less often
examined. Identifying the neurobiological correlates and underpinnings of psychological
disorders has been vital in advancing our understanding of specific mechanisms and risk
factors – especially in the case of schizophrenia (Torrey, 2006). However, psychopathology is fundamentally rooted in a disruption of conscious experience; it is not a complaint of neurochemical imbalance that brings patients to treatment centers or psychiatric hospitals – it is instead the disturbances these individuals encounter in their daily experiences of self, others, and the world that ultimately bring them to the point of seeking intervention (Nelson, Yung, Bechdolf, & McGorry, 2007). Understanding subjective experience in schizophrenia is therefore crucial to creating a more complete and coherent conceptualization of the disorder.

*Ipseity-Disturbance Model.*

One response to the need for better understanding of subjective schizophrenic experience, and the framework for the present study, is the ipseity disturbance model (Sass & Parnas, 2003). The term ipseity comes from the Latin word *ipse*, meaning “self” or “itself”, and in the case of the phenomenological model posited by Sass and Parnas (2003), is meant to describe the most fundamental, pre-reflective level of self. Normal human experience involves absorption in activity within a world of both animate and inanimate objects, and this absorption provides a sense of “inhabiting our self in a pre-reflective, tacit, or automatic fashion,” (Nelson, Sass, et al., 2009). As a function of this process, experiences are interpreted as occurring in a first-person mode of representation (Nelson, Sass, et al., 2009). For example, when engaging in a normal conversation one does not generally need to recognize or question that they are sitting back and listening while the other person is speaking – instead, an individual has an inherent “mineness” to
their experiences that creates a background of pre-reflective self-awareness upon which other conscious activity takes place. Therefore an individual’s awareness of what another person is saying to them takes place against a background of implicitly knowing that they themselves are aware of and listening to the other person speak. A disturbance at this ipseity level would then generate the potential for abnormalities of consciousness, as the background on which an individual experiences stimuli and the world would not be properly intact.

As justification for the integration of phenomenology in understanding schizophrenia, proponents of the ipseity disturbance model argue that in order to improve our understanding of the pervasive and enduring abnormalities of consciousness that characterize the disorder, consideration of subjective experiences is required (Sass & Parnas, 2003). Based upon what they refer to as “complementary distortions of consciousness,” Sass and Parnas (2003) posit that many of the symptoms and phenomena associated with schizophrenia are ultimately attributable to a disruption in the sense of self. The first concept in this pair of distortions is known as hyper-reflexivity, a term that describes a form of exaggerated self-consciousness involving an individual experiencing the self, or what would normally be experienced as an implicit aspect or feature of the self, as extremely salient (Sass & Parnas, 2003). For instance, the act of breathing is generally tacit for most individuals. In the presence of hyper-reflexivity, however, the normally implicit process would become a focus of acute awareness and would be experienced as especially important and prominent. The complementary process that comprises the disturbance of self is known as diminished self-affect. Within this model,
this concept is characterized by the attenuation of one’s basic sense of self-presence, or a lessening of the “implicit sense of existing as a vital and self-possessed subject of awareness,” (Sass & Parnas, 2003). Diminished self-affect describes difficulties with distinguishing and subsequently understanding features of the self as being components of the inherent self-hood that exists as part of normal human experience. Alterations of consciousness caused by hyper-reflexivity and diminished self-affect are important in understanding how certain experiences of typically tacit stimuli become extremely salient for those living with schizophrenia. More specifically, if an individual with schizophrenia is not able to recognize the “self” as an autonomous entity, and also has a propensity to assign great valence to experiences that would otherwise be implicitly accepted as part of the self, it is likely that this individual will experience perceptual abnormalities. For example, the experience of auditory hallucinations is thought to be related to abnormal perception of internal speech (Frith, 1987). Many schizophrenia patients report experiencing “running commentary” hallucinations that involve a voice describing the patient’s thoughts or actions as they occur. According to the ipseity-disturbance model, if a patient fails to recognize the self as the source of the internal speech (diminished self-affect) and also perceives the speech as especially striking or intrusive (hyper-reflexivity), they will perceive this inner speech as being external – in this case, as a commenting voice. This example is relevant in demonstrating how normative human experience – inner speech – can become distorted by means of diminished self-affect and hyper-reflexive awareness (Sass & Parnas, 2003).
Source-Monitoring.

Additionally, the ipseity-disturbance model asserts an association with phenomena observed in schizophrenia, such as source-monitoring errors (Sass & Parnas, 2003). Source-monitoring refers to the ability of an individual to accurately identify or recall the source from which information was acquired. Source monitoring is often studied within an experimental framework that requires participants to remember whether a specific piece of information in memory was presented during a task, and then to discern which specific information was obtained from which particular source. In one paradigm, participants must determine if information originated from either an external (e.g., words recited by a test administrator) or internal (e.g., words generated by the participant) source. Research on source-monitoring in schizophrenia has revealed patient deficits in discriminating between internal and external sources of information (Ditman & Kuperberg, 2005; Gallagher, 2004). Relatedly, schizophrenia patients demonstrate deficits in discriminating between information self-generated internally versus externalized. For example, in one study (Keefe, Arnold, Bayen, & Harvey, 1999), schizophrenia patients had significantly poorer performance compared to non-psychiatric controls when discriminating between words they had been instructed to say out loud (externalized) versus words they had been instructed to imagine saying to themselves (internal). This performance discrepancy is consistent with deficits in appropriately discriminating between internal and external information amongst schizophrenia patients (Keefe, Arnold, Bayen, McEvoy, & Wilson, 2002). In keeping with the ipseity
disturbance model, the inability of an individual to discriminate between internally versus externally generated information, and between internal versus externalized, socially-shared information, could be understood as products of a disrupted sense of self. Purely internal information, if perceived as external, may become confusing and potentially disturbing and may result in reality-distortion symptoms.

Emotion Perception and Social Functioning.

Building upon the model of Sass and Parnas (2003), Nelson, Sass, et al. (2009) put forth an extension of the ipseity-disturbance model accounting for social cognitive deficits observed in schizophrenia as well. In this model, social cognitive difficulties, such as deficits in emotion perception, and impairments in social functioning, are understood as secondary indexes or markers of the more primary disturbance of self (Bell, Bryson, & Lysaker, 1997). This phenomenologically oriented framework posits that self-presence is the primary, most basic ground for the intentionality of consciousness – including the capability to direct consciousness towards others and the surrounding world. A disruption in this basic ground of conscious life then has a resounding impact on social perception and functioning.

Sense of Self in the Present Study.

As normal human experience involves constant immersion in subjective experience, conceptualizing self in an objective manner is a demanding task. In the present study, self can be understood as comprising the foundation upon which we have
subjective experiences of our daily lives. A disruption in the sense of self as seen in schizophrenia is representative of a broad abnormality of consciousness (i.e., the way we experience ourselves and the world around us) that provides a platform for the presentation of psychiatric symptoms and other manifestations of the disorder. As previously mentioned, subjective experience, and the underlying sense of self, are inherently difficult to measure. Though an individual can potentially be assessed objectively by determining developmental level or utilizing behavioral measures, sense of self is a phenomenological construct that cannot be captured adequately by strictly objective measures. Rather, subjective, spontaneous descriptions of the self were analyzed systematically to assess aspects of the sense of self. This relatively unstructured approach allows a more spontaneous response that, though grounded in conscious description, permits access to unconscious experience by means of verbal report, similar to projective assessment techniques and the narrative methods of psychotherapy (Blatt, Bers, & Schaeffer, 1992). The Assessment of Self Descriptions (Blatt et al., 1992) is a collection of subscales that assess sense of self as revealed in minimally prompted self-descriptions. These scales were developed to operationally define and measure aspects of the sense of self within a psychodynamic framework, and are based upon a review of literature relevant to clinical, social, and developmental psychology, with an emphasis on identification of aspects of the sense of self. These scales are designed to measure “important dimensions of self-representations across a broad range from normality to severe psychopathology,” (Blatt et al., 1992).
To assess sense of self as conceptualized in the present study, we chose to focus on several overarching domains of self central to the ipseity disturbance model: integration of the self, modes of description of the self, sense of agency, self definition, and relatedness to others. Integration of the self assesses the degree to which an individual understands the self as having multiple, compatible life roles (e.g., mother, coworker, patient, film aficionado, etc.), and the degree to which they are able to integrate these roles in a cohesive way. The ability to accommodate multiple roles is likely indicative of flexibility in the sense of self, in contrast to a static or ambiguous understanding of one’s self that does not readily accommodate variable life roles. Similarly, the variety in modes of description one uses when describing the self (e.g., personality traits, physical and demographic properties, etc.) offers a sense of the depth of self understanding. Individuals with an intact sense of self are more readily able to describe themselves in a multitude of modes, rather than focusing mostly or even exclusively on a particular aspect of the self. Sense of agency, which is defined inconsistently across the literature, is understood in the present study as the extent to which an individual views the self as stable and able to achieve goals in personally relevant life areas. A deficient sense of agency may manifest as negative and overly critical regard for the self, as well as a lack of ambition or inability to specify life domains that are personally meaningful. Similarly, level of self definition is important to sense of self in that it indicates the extent to which an individual has a clearly defined identity and is able to articulate personal values. High levels of self definition indicate a well-developed sense of self and an accompanying sense of purpose. Finally, the sense of
relatedness was also of interest in the present study. While this domain may seem to be less central as it assesses social relationships, it is still meaningful in measuring sense of self. Human beings are naturally social creatures and, while individual differences exist, social interaction is typically advantageous from an evolutionary perspective. The relatedness domain of self encompasses the extent to which an individual articulates his or her relationships when describing the self, and also the impact of others and relationships. An individual with an intact sense of self will likely mention and describe relationships in detail, while an individual with a disrupted sense of self may not focus as much on relationships as a result of being preoccupied with confusing or disturbing self experiences. A healthy sense of self better equips an individual to engage with others around them, and thus have more developed relationships.

Study Aims.

Though an ever-expanding literature base exists for the phenomenology of schizophrenia and, more recently, the self and the ipseity-disturbance model, fairly limited empirical research has been conducted to test these ideas. This may be, in part, due to the difficulties that exist in terms of measuring phenomenological constructs (Rhinewine, 2004), as subjective experience cannot be directly measured. Using the previously specified scales from The Assessment of Self Descriptions (Blatt et al., 1992), we assessed aspects of the sense of self from spontaneous self-descriptions. Previous research conducted with these scales (Bers, Blatt, Sayward, & Johnston, 1993) has demonstrated adequate inter-rater reliability. Additionally, a previous investigation of the
use of the sense of self scales in schizophrenia (Rhinewine, 2004) found that schizophrenia patients and their first-degree relatives exhibited abnormalities in their sense of self compared with matched controls. Guided by Sass and Parnas’ model, the current study assessed the extent to which sense of self is disrupted in schizophrenia, and also whether or not this disruption is specific to schizophrenia rather than to psychosis in general. This was accomplished by examining relevant sense of self scale score differences between patients with schizophrenia, patients with bipolar disorder with psychotic features, and non-psychiatric controls. The psychiatric control group was included to assess the hypothesized specificity of ipseity-disturbance to schizophrenia rather than to psychosis in general and thus to assess the discriminant validity of the SOS model. Psychosis, by definition, involves serious alterations of consciousness and subjective experience. Understandably, an individual prone to experiencing psychotic symptoms may also experience abnormalities of consciousness that may be difficult to differentiate from a disrupted sense of self more specifically. Previous research demonstrating that deficient sense of self has been observed in prodromal schizophrenia patients (Vollmer-Larsen, 2008) provides evidence that these abnormalities are not attributable solely to psychosis. Evidence suggesting that psychosis may cause structural changes to the brain also exists (Pantelis et al., 2002). While other work has not replicated these findings (Ho et al., 2003), the inclusion of a patient group that also has a history of psychosis is helpful to test whether disturbed sense of self may be solely a cause or a product of psychotic disturbance, or whether it is specifically schizophrenia related. Specificity to schizophrenia would be most consistent with ipseity-disturbance as
presented by Sass & Parnas (2003). Lastly, the relationships of disturbed sense of self in schizophrenia to the specific phenomena of emotion perception, source-monitoring, and social functioning were examined. If disturbance in sense of self was found to be a marker of schizophrenia, further research to assess the ability of such measures to identify at-risk individuals or those in the prodromal phases of schizophrenia could be highly beneficial in terms of earlier identification, which has been associated with better prognosis and outcome (Wu et al., 2003).

Hypotheses

The present study tested five hypotheses: it was anticipated that (1) schizophrenia patients would demonstrate significantly lower sense of self scale scores on selected subscales than either (a) the patients with bipolar disorder with psychotic features or, (b) the non-psychiatric controls; (2) in schizophrenia patients, lower scores on selected sense of self domains would be associated with (a) poorer performance on emotion perception tasks, (b) poorer performance on source-monitoring tasks, and (c) lower scores on a measure of interpersonal social functioning.
METHODS

Participants.

Participants (N=91) were drawn from a larger study of cognitive bases of language symptoms in schizophrenia (Docherty, 2011). The sample included three groups: schizophrenia patients, bipolar patients, and a group of non-psychiatric controls. Descriptions of these groups follow. A summary of mean ages, years of education, and gender proportions by group appear in Table 1. Participants meeting any of the following exclusion criteria were excluded from the study: history of epilepsy or seizures, current substance abuse, history of drug or alcohol dependence serious enough to warrant inpatient detoxification, history of traumatic brain injury or history consistent with or indicative of any other sort of organic brain damage, mental retardation, or any history of inhalant use. These exclusion criteria were put in place to exclude participants with cognitive deficits based upon possible brain injury, damage attributable to these types of conditions or psychological states rather than to the conditions of interest. Informed consent was obtained from each participant before undertaking any study-related procedures. All participants spoke English as their primary language. Subjects were financially compensated commensurate with the time and travel associated with participation in the study.
Table 1: Group Demographics and Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>Schizophrenia¹</th>
<th>Bipolar</th>
<th>Control³</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>50</td>
<td>17</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Mean Age (SD)</td>
<td>39.09(9.87)</td>
<td>37.24(9.02)</td>
<td>38.22(19.17)</td>
<td>p = 0.778</td>
</tr>
<tr>
<td>Gender (%)</td>
<td>Male 25 (50)</td>
<td>10 (59)</td>
<td>13 (54)</td>
<td>p = .806</td>
</tr>
<tr>
<td></td>
<td>Female 25 (50)</td>
<td>7 (41)</td>
<td>11 (46)</td>
<td></td>
</tr>
<tr>
<td>Race (%)</td>
<td>African American 36 (72)</td>
<td>5 (29)</td>
<td>14 (58)</td>
<td>p = .016*</td>
</tr>
<tr>
<td></td>
<td>Caucasian 14 (28)</td>
<td>10 (59)</td>
<td>10 (42)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Native American --</td>
<td>1 (6)</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Asian --</td>
<td>1 (6)</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Mean Years of Education (SD)</td>
<td>11.74(1.84)</td>
<td>12.59(2.09)</td>
<td>15.13(2.24)</td>
<td>p &lt; .001*</td>
</tr>
<tr>
<td>Mean Highest Parent Education (SD)</td>
<td>12.48(2.69)</td>
<td>13.56(2.68)</td>
<td>12.35(1.43)</td>
<td>p = .242</td>
</tr>
<tr>
<td>Mean GAF³ (SD)</td>
<td>47.64(13.38)</td>
<td>56.00(8.10)</td>
<td>83.07(8.71)</td>
<td>p &lt; .001*</td>
</tr>
<tr>
<td>Mean PANSS⁵ (SD)</td>
<td>66.05(17.99)</td>
<td>52.87(12.75)</td>
<td>--</td>
<td>p = .011*</td>
</tr>
<tr>
<td>Positive</td>
<td>17.15(6.83)</td>
<td>13.31(4.18)</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>15.15(4.80)</td>
<td>10.81(3.97)</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>33.41(9.63)</td>
<td>28.40(8.24)</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Mean Word Count for Narratives⁷</td>
<td>541.20(231.51)</td>
<td>484.00(262.56)</td>
<td>579.08(200.31)</td>
<td>p = .430</td>
</tr>
<tr>
<td>Mean SOS Scores (SD)</td>
<td>Articulation of Relatedness 4.20(0.97)</td>
<td>4.06(1.25)</td>
<td>4.50(0.89)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quality of Relatedness 3.59(1.36)</td>
<td>4.02(1.54)</td>
<td>4.87 (1.51)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Level of Relatedness 4.57(1.39)</td>
<td>5.44(1.66)</td>
<td>6.43(1.21)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Level of Self-Definition 4.50(1.54)</td>
<td>6.18(1.67)</td>
<td>7.25(1.65)</td>
<td></td>
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<tr>
<td>----------------------------------------------</td>
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<td></td>
</tr>
<tr>
<td>Positive Self Regard</td>
<td>4.08(1.21)</td>
<td>4.88(.93)</td>
<td>5.42(1.10)</td>
<td></td>
</tr>
<tr>
<td>Substantiality</td>
<td>3.98(1.02)</td>
<td>4.19(.83)</td>
<td>4.45(.67)</td>
<td></td>
</tr>
<tr>
<td>Agency, Striving</td>
<td>2.51(.81)</td>
<td>2.82(.99)</td>
<td>3.37(.86)</td>
<td></td>
</tr>
<tr>
<td>Substantiation</td>
<td>2.88(.94)</td>
<td>3.06(.90)</td>
<td>3.46(.59)</td>
<td></td>
</tr>
<tr>
<td>Differentiation/Integration</td>
<td>3.48(1.07)</td>
<td>3.88(1.27)</td>
<td>5.54(1.22)</td>
<td></td>
</tr>
<tr>
<td>Agency Index</td>
<td>11.09(2.69)</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Differentiation Index</td>
<td>6.36(1.80)</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Relatedness Index</td>
<td>12.37(1.80)</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Emotion Perception</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Ekman Faces</em></td>
<td>22.04(6.06)</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td><em>BLERT</em></td>
<td>13.29(3.97)</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Source-Monitoring</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Total Correct</em></td>
<td>13.33(3.57)</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Social Functioning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Prosocial Performance</em></td>
<td>108.47(16.23)</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td><em>Social Engagement</em></td>
<td>100.44(11.98)</td>
<td>--</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td><em>Interpersonal Functioning</em></td>
<td>118.38(14.41)</td>
<td>--</td>
<td>--</td>
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</tr>
</tbody>
</table>

Notes: 1n=50, 2n=17, 3n=24, 4Global Assessment of Functioning, 5Positive and Negative Syndrome Scale for Schizophrenia, total score listed first followed by subscale scores 6Speech Samples assessed with The Assessment of Self Descriptions, 7Agency index is the sum of the level of self-definition, sense of agency negative-positive self regard, and sense of agency striving/ambitious variables, 8Differentiation index is the sum of the substantiability and differentiation/integration variables, 9Relatedness index is the sum of the articulation of relatedness, quality of relatedness, and level of relatedness variables, 10total 35 possible, 11total 21 possible, 12total 24 possible, 13Scaled scores. *Significant at the p = .05 level.
Schizophrenia Patients. The schizophrenia patient group (N=50) included outpatients being treated at community mental health centers in Akron, Ohio. All participants met Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition, Text Revised (American Psychiatric Association [DSM-IV], 2000) criteria for schizophrenia when assessed in connection with the larger study. Diagnoses were confirmed using the Schedule for Affective Disorders and Schizophrenia ([SADS]; Spitzer & Endicott, 1977). SADS interviews were conducted by graduate level psychology students with appropriate backgrounds in the study of schizophrenia and psychosis. All diagnoses were confirmed under the supervision of a licensed clinical psychologist. Current psychiatric symptoms were assessed and appear in Table 1.

Bipolar Patients. The bipolar patient group (N=17) included outpatients being treated at community mental health centers in Akron, Ohio. All participants met Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition, Text Revised criteria for bipolar disorder with psychotic features when assessed in connection with the larger study. Diagnostic status was confirmed using the same method as previously discussed. Patients were in a current manic, hypomanic, or euthymic phase of illness; individuals currently in a depressive phase of illness were not included. Current psychiatric symptoms were assessed and appear in Table 1.
Controls. Control participants (N=24) were individuals recruited from the Akron, Ohio metro area by means of flyers placed in local churches, community centers, social service agencies, community laundry facilities, and throughout the university campus. Controls were administered the SADS to rule out any history of psychotic symptoms. These participants were comparable to the psychiatric participants in terms of age, gender, and ethnicity.

Measures

Self-Descriptions. The self-descriptions utilized in the present study were transcriptions of participant speech collected in connection with the larger study of language. Following the method of Blatt et al. (1992), interviewers elicited the self-descriptions with the simple instruction to “describe yourself as fully as you can.” Participants were asked to spontaneously respond to this prompt for five minutes, and their responses were audio-recorded. The interviewers were instructed not to speak during the self-descriptions, with the exception of a single probe of “is there anything more you can tell me to describe yourself?” if the participant stopped speaking for more than thirty seconds.

Sense of Self Scales. The Assessment of Self Descriptions (Blatt, Bers, & Schaeffer, 1992): was used to measure sense of self from the transcribed self-descriptions. From
eighteen original scales, we selected nine subscales as the most relevant to the measurement of sense of self as conceptualized in the present study. The remaining scales are not without merit in the measurement of sense of self, but are designed to measure cognitive aspects (introspection, level of cognitive development) or affective components (anxiety and depression) that were not as relevant to our conceptualization of self. The Cronbach’s alpha for the sense of self scales in the present study was within an acceptable range (α = 0.792). Specific descriptions of the scales selected for the present study follow. Descriptive values for these scale scores can be found in Table 1 and Figure 1.

![Figure 1 – Sense of Self Scale Scores by Group](image-url)
**Substantiality.** The substantiality scale assesses and counts the modes of representation an individual uses when describing the self. Four modes are counted: (1) physical and demographic properties, (2) overt behavioral features, (3) personality traits, and (4) inner thoughts, feelings, and values. One point is given for each mode used, for a total of four possible points.

**Differentiation and Integration.** The differentiation and integration scale is a measure of the degree to which a self-description is characterized by multiple life domains, including social life, leisure activities, interests, work, school, family, and personal qualities. One point is given for each domain mentioned, with a total of six points possible. The integration of the domains as articulated in the self-description adjusts this total up by one point for high integration, or down one point for low integration. No score adjustment is made for moderate levels of integration. A score of (7) is given when the individual refers to six or more domains which are highly integrated.

**Level of Self Definition.** The level of self definition scale examines the extent to which the self-description conveys that the individual has a clearly defined identity, along with particular goals and values that demonstrate a sense of agency. Scores are given on a scale of (1) to (7), with lower scores characterized by no articulation of a sense of self or a reactive preoccupation with defining or protecting one’s own rights or individuality.
Higher scores are indicative of an integration of past and present experiences into an identity that allows the articulation of values and a sense of purpose.

*Sense of Agency, Negative-Positive Self-Regard.* The Negative-Positive Self-Regard scale evaluates the primary way in which the individual views the self. Scores are given on a scale of (1) to (7), with lower scores indicating the self is viewed in a primarily negative and harsh way, whereas higher scores indicate a stable sense of self with feelings of confidence, strength, and positive self-regard.

*Sense of Agency, Self-Critical*. The self-critical scale evaluates the degree to which the individual makes specific harsh judgments about the self, indicating a lack of satisfaction with oneself. Scores are given on a scale of (1) to (5), with low scores indicating a non-critical view of the self, and high scores demonstrating that the individual is highly critical and feels driven by standards that are unmet. Both the intensity and pervasiveness of self-criticism are taken into account when scoring this item. Scores on this item were reversed for data analysis so that lower scores indicated higher levels of self-criticism.

1 While the Self-Critical and Negative-Positive Self-Regard variables appear similar, they measure different facets of self-perception and thus both were included in the present study. Negative-Positive Self-Regard assesses the *overall* way in which one views the self, while the Self-Critical variable takes account *specific* articulations of self-criticism. It is possible to make critical statements about the self, yet still view the self in a primarily positive way.
**Sense of Agency, Striving/Ambitious.** The striving/ambitious scale measures the individual’s drivenness and striving for accomplishments. Interests, occupations, and other work central to the individual’s sense of self are scored; these motivations may be either self-generated or determined by external factors. Scores are given on a scale of (1) to (5), where low scores demonstrate an explicit mention of lack of ambition or striving, whereas higher scores indicate a strong motivational drive. When it is not possible to rate this variable, it is recorded that a score is not possible.

**Articulation of Relatedness.** The articulation of relatedness scale assesses the extent to which other people are mentioned in terms of relationships. This scale measures the articulation and specificity of interpersonal relatedness, but does not assess the quality of the relationship. This scale is scored on a range of 1 to 5, where a score of (1) indicates no explicit mention of others, and a score of (5) demonstrates specification and elaboration of one or more particular relationships.

**Quality of Relatedness.** The quality of relatedness scale measures the quality of the individual’s feelings for and perceptions of others, and how the individual perceives people as impacting the self in either a positive or negative manner. Scores are given on a scale of (1) to (7), with lower scores demonstrating emotional detachment, feelings of
rejection by others, or interpersonal distance. Higher scores indicate engagement with others, friendliness, and caring about others. At times it is not possible to rate this variable from spontaneous speech; in these cases, it is recorded that a score is not possible.

Level of Relatedness. The level of relatedness scale reflects the extent to which the relationships described in the self-descriptions are reciprocal and empathic. Scores are given on levels ranging from (1) to (7). Lower scores indicate feelings of being either indistinguishable from others or socially isolated, while higher scores indicate mutuality and reciprocal caring in close relationships. When it is not possible to rate this variable, it is recorded that a score is not possible.

Validity of the Sense of Self Scales. Previous research with the scales from The Assessment of Self Descriptions has demonstrated validity in discrimination of psychiatric patients from non-patients (Bers et al., 1993). Previous work in our laboratory (Docherty, Cutting, & Bers, 1998; Rhinewine, 2004) has demonstrated predictive validity of the level of self-definition, substantiality, differentiation/integration, and quality of relatedness scales in differentiating schizophrenia patients, controls, and relatives of both groups. Auerbach & Blatt (1996) examined qualitative differences in the self-descriptions of patients with severe psychopathology, with specific focus upon disorders characterized
by disturbances in self-representation. Notable differences emerged in terms of negative-positive self-regard, level of self-definition, and self-criticism, with schizophrenia patients demonstrating a more deficient sense of identity compared to patients with borderline personality disorder. Beyond these studies, little literature examining the scales from the Assessment of Self Descriptions is available.

*Raters.* The sense of self scales were rated by the primary author. A subsample of self-descriptions was also rated by a licensed clinical psychologist with extensive background in schizophrenia and language. Intra-class correlation coefficients (ICCs) were calculated for each subscale on a subset of fifteen self descriptions to test inter-rater reliability; ICCs yielded adequate to excellent levels (.701 - .973) of reliability across all variables. ICC values for specific variables appear in Table 2.

*SOS Indices.* We combined subscales as guided by Blatt & Ber’s (1992) factor analysis and conceptual scale content to create three index scores of differentiation, agency, and relatedness. The composition and derivation of these index scores follow. All variables included in the index scores were standardized prior to being summed.
Differentiation Index. The differentiation index score was calculated by summing the scores of the substantiality and differentiation/integration variables.

Table 2: Sense of Self Scale Scores – Intraclass Correlation Coefficients\(^1\) (ICC)

<table>
<thead>
<tr>
<th></th>
<th>Intraclass Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articulation of Relatedness</td>
<td>0.959</td>
</tr>
<tr>
<td>Quality of Relatedness</td>
<td>0.964</td>
</tr>
<tr>
<td>Level of Relatedness</td>
<td>0.973</td>
</tr>
<tr>
<td>Level of Self Definition</td>
<td>0.871</td>
</tr>
<tr>
<td>Sense of Agency, Negative-Positive</td>
<td>0.735</td>
</tr>
<tr>
<td>Sense of Agency, Self-Critical</td>
<td>0.752</td>
</tr>
<tr>
<td>Sense of Agency, Striving/Ambitious</td>
<td>0.932</td>
</tr>
<tr>
<td>Substantiality</td>
<td>0.701</td>
</tr>
<tr>
<td>Differentiation/Integration</td>
<td>0.885</td>
</tr>
</tbody>
</table>

Notes: \(^2\) raters, single-measures.

Agency Index. The agency index score was calculated by summing the scores of the level of self definition, sense of agency negative-positive, and sense of agency striving variables.

Relatedness Index. The relatedness index score was calculated by summing the scores of the articulation of relatedness, quality of relatedness, and level or relatedness variables.
Emotion Perception. The Ekman Emotional Faces Task (Ekman & Friesen, 1976) consists of static images of 35 human faces displaying one of six emotions (happy, sad, scared, disgusted, angry, neutral). The participant is provided a list of the six possible emotions, and is asked to select the one emotion they feel best describes each image presented. In previous research with schizophrenia patients, performance on the Ekman Emotional Faces Task was related to performance on other facial and vocal emotion perception tasks (Kerr & Neale, 1993). The Cronbach’s alpha for this task in the present study was within an acceptable range ($\alpha = 0.769$).

The Bell & Lysaker Emotion Recognition Task (BLERT) (Bell et al., 1997) consists of 20 short video segments of a man making statements regarding his job. In each segment, the man portrays one of six emotions (happy, sad, scared, disgusted, angry, neutral) by means of tone, rate of speech, and facial expression. Participants are provided a list of the six possible emotions, and are asked to select the one emotion they feel best describes the presented video clip. Previous research with the BLERT (Bell et al., 1997) has demonstrated discriminant validity in differentiating those with psychopathology or cognitive impairment from non-psychiatric controls, as well as score stability over time for schizophrenia patients specifically. In previous research with schizophrenia patients, performance on the BLERT was related to performance on other facial emotion perception tasks (Pinkham & Penn, 2006). The Cronbach’s alpha for this task in the present study was within an acceptable range ($\alpha = 0.729$).
In the present study, performance on the Ekman Emotional Faces Task and BLERT emotion perception tasks were significantly correlated ($r = .668$, $p < 0.001$).

*Source-monitoring.* The Source-monitoring Tasks (Nienow & Docherty, 2004) consist of two tests of source-monitoring. In the first task (internal source-monitoring), the participant is shown a series of incomplete sentences, and is asked to think of the correct word to fill in the missing portion. The answers to these incomplete sentences are self-evident (e.g., a five-cent coin is called a _____ [correct response: nickel]; Independence day is celebrated on the 4$^{\text{th}}$ of _____ [correct response: July]). The participant is instructed not to say the word out loud, unless the next stimulus in the set instructs them to explicitly do so by displaying the cue, “Answer.” After completing the incomplete sentences, the participant has said eight words out loud (“say” words) and has thought eight words to themselves (“think” words). The participant is then given a list of twenty-four words and asked to identify which words are “say” words (eight items), which items are “think” words (eight items), and which words are “new” – meaning they were not included in the task at all (eight items). Previous research has demonstrated that performance on the source-monitoring task is associated with schizophrenia and formal thought disorder (Nienow & Docherty, 2004). The Cronbach’s alpha for this task in the present study was within an acceptable range ($\alpha = 0.694$). This task is of central interest to the present study and was included in the primary analyses.
In the second task (external source-monitoring), the participant listens to an audio recording of a man and a woman saying eight short sentences each. After listening to the entire audio file, the participant is presented with a list of sentences, and asked to indicate which sentences the man said, which sentences the woman said, and which sentences were not part of the task at all. This task measures the participant’s ability to discriminate between two external sources. Performance on this task was not of primary interest in the present study, but is meaningful in assessing auditory memory more broadly. The Cronbach’s alpha for this task in the present study was within an acceptable range (α = 0.636). The internal and external source-monitoring tasks both rely on general cognitive functions, attention, memory, and general source-monitoring. The primary difference between the tasks is that the internal (say/think) source monitoring task specifically requires discrimination of internal versus externalized information. For the purposes of data analysis, the scores on the second source-monitoring task were regressed out of scores on the first source-monitoring task. This allowed us to measure internal source-monitoring after accounting for differences between subjects on the more general cognitive functions.

Social Functioning. The Birchwood Social Functioning Scale (SFS; Birchwood, Smith, Cochrane, Wetton, & Copestake, 1990) is a 79-item scale designed to assess social functioning in schizophrenia. The domains of Social Engagement, Interpersonal Functioning, and Prosocial Behavior were utilized as they were most relevant to the
present study. The remaining domains of the scale (Employment, Recreation, Competence) are more focused on solitary activity than interpersonal interactions, and consequently were not included in the present study. The SFS scales have been shown to be associated with schizophrenia, and the scales demonstrate adequate reliability (alpha coefficients 0.69 – 0.85) (Birchwood et al., 1990). Previous research with schizophrenia patients has shown that scores on the SFS are related to other measures of community functioning and social problem solving (Addington & Addington, 1999). The Cronbach’s alpha for this task in the present study was within an acceptable range (α = 0.637).

Global Functioning. The Global Assessment of Functioning (GAF) from the DSM-IV-TR was administered to all participants to evaluate current level of functioning. The GAF is a brief measure of psychiatric disturbance and its impact on psychological, social, and occupational functioning. Scores are made from 1 to 100 based upon level of impairment, with lower scores indicating more severe disturbance. Descriptive sentences are provided as anchors for each ten point range.

Psychiatric Symptoms. Both the schizophrenia and bipolar group participants were administered the Positive and Negative Syndrome Scale for Schizophrenia (PANSS; Kay, Fiszbein, & Opler, 1997) to assess current psychiatric symptoms. The PANSS is 30-item interviewer-rated, semi-structured assessment. Separate subscales are present for positive,
negative, and general symptoms. Each item is rated on a scale of 1 (“Not Present”) to 7 (“Extreme”). Ratings are obtained for individual items, and then scores for subscales and total scores can be obtained by summing the appropriate items in each section. In the present study, the subscale scores for Positive, Negative, General, and Total symptoms were utilized. Intra-class correlation coefficients for these subscales demonstrated excellent (0.927 - 0.978) inter-rater reliability in our group.

*Analysis*

The analysis was completed in three parts. First, to assess the hypothesis related to group differences in sense of self, schizophrenia patient, bipolar patient, and non-psychiatric control groups were compared on the sense of self scales. This was accomplished with a group-by-variable MANOVA including each of the nine standardized sense of self subscales. Given the conceptual interrelatedness and intercorrelation of the sense of self scores, a multivariate analysis approach was appropriate. Planned simple contrasts were utilized with the schizophrenia patients as the comparison group.

Due to group differences on measures of overall pathology and functioning (PANSS and GAF; See Table 1) between the bipolar and schizophrenia patient groups, a follow-up group-by-variable MANCOVA was conducted. The sense of self scores found to be significantly different between the patient groups in the first MANOVA were
entered as dependent variables, and the PANSS and GAF scores were specified as covariates. As the groups differed on race, secondary analyses also tested for within-group differences on sense of self scale scores between African American and Caucasian patients.

To test the hypotheses regarding the specific relationship of sense of self scale scores to specific phenomena in the schizophrenia group, bivariate correlations (Pearson’s r) between the sense of self scores and the emotion perception, source monitoring, and social functioning variables were obtained. In order to further elucidate these relationships, index scores were created for the domains of agency, relatedness, and differentiation. Bivariate correlations (Pearson’s r) were calculated to examine the relationship between index scores and emotion perception, source monitoring, and social functioning. Participants with scores in the top and bottom quartile for each variable were identified and subsequently placed in low and high groups for each variable. These extreme groups were then compared on the variables of interest using independent T-tests.

**Missing Data.** As discussed in the Measures section, three of the sense of self variables (quality of relatedness, level of relatedness, and sense of agency striving/ambitious) cannot always be scored from the self-descriptions. This is primarily a byproduct of the spontaneous nature of the speech samples, whereby not all individuals articulate certain components required to score these variables. In deciding how to deal with these missing
data, we followed the guidelines put forth by Blatt et al. (1992) in the Assessment of Self Descriptions manual, which advocates the use of mean replacement. Mean values by group were calculated for each of these three variables, and missing values were replaced accordingly prior to analysis. The use of mean replacement allowed us to retain our group sample sizes. For specific values and number of missing data points by group, see Table 3.

Table 3: Cases with Missing Data for Specific Variables – By Group

<table>
<thead>
<tr>
<th></th>
<th>Schizophrenia(^1)</th>
<th>Bipolar(^2)</th>
<th>Control(^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of Relatedness</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Level of Relatedness</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Sense of Agency, Striving/Ambitious</td>
<td>9</td>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>

Notes: \(^1\)n=50, \(^2\)n=17, \(^3\)n=24
RESULTS

Group Demographics, Symptoms, and Functioning.

Groups were compared on demographic, symptom, and functioning variables (Table 1). Analyses revealed significant group differences on years of education ($F[2, 89] = 22.828, p < 0.001$) race ($\chi^2 = 15.692, df = 2, p = .016$), GAF ($F[2, 89] = 52.077, p < 0.001$), and total PANSS score ($t[58] = 2.615, p = 0.039$). No significant group differences were noted on participant age ($F(2, 89) = 0.252, p = 0.778$), highest level of parent education ($F[2, 82] = 1.442, p = 0.242$), or gender ($\chi^2 = 0.431, df = 2, p = .806$).

Bivariate correlations were obtained to examine the association between demographic, symptom, and functioning variables found to be significantly different between groups (years of education, GAF, and PANSS scores) and the sense of self variables. For the schizophrenia patients, GAF score was correlated with quality of relatedness ($r = 0.440, p = 0.002$) and agency negative-positive ($r = 0.397, p = 0.006$); total PANSS score was correlated with substantiality ($r = -0.314, p = 0.036$) and level of self-definition ($r = -0.353, p = 0.017$); years of education was not significantly correlated with any of the sense of self variables. For the bipolar patients, years of education was correlated with level of self definition ($r = .559, p = 0.020$); GAF score and PANSS score were not significantly correlated with any of the sense of self variables. For the non-
psychiatric controls, neither years of education nor GAF score were significantly correlated with any of the sense of self variables.

Due to differences on race between groups, t-tests were performed within each group to examine differences in sense of self scale scores between African American and Caucasian participants. In both the schizophrenia and bipolar patient groups, none of the sense of self scale scores were significantly different between African Americans and Caucasians. In the non-psychiatric control group, articulation of relatedness scores were higher for Caucasians than African Americans (t = -2.453, df = 21, p = 0.022); no other sense of self scale scores were significantly different between racial groups. Bivariate correlations for the sense of self scale scores appear in Table 4. Scores tended to correlate positively with each other.

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Articulation of Relatedness</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td>2. Quality of Relatedness</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Level of Relatedness</td>
<td>.263**</td>
<td>.768**</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>4. Level of Self Definition</td>
<td>.237*</td>
<td>.487**</td>
<td>.529**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Agency, Negative-Positive</td>
<td>.315**</td>
<td>.452**</td>
<td>.531**</td>
<td>.569**</td>
<td></td>
<td></td>
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<tr>
<td>6. Agency, Self-Critical</td>
<td>-.120</td>
<td>.425**</td>
<td>.262</td>
<td>.123</td>
<td>.660**</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>7. Agency, Striving/Ambitious</td>
<td>.153</td>
<td>.350**</td>
<td>.379**</td>
<td>.470**</td>
<td>.415**</td>
<td>.215</td>
<td></td>
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<tr>
<td>8. Substantiality</td>
<td>.251*</td>
<td>.333**</td>
<td>.352**</td>
<td>.399**</td>
<td>.271**</td>
<td>-.173</td>
<td>.309**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Differentiation/Integration</td>
<td>.331*</td>
<td>.458**</td>
<td>.549**</td>
<td>.595**</td>
<td>.522**</td>
<td>.028</td>
<td>.535**</td>
<td>.557**</td>
<td></td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed)
To examine group differences on the sense of self variables between groups, a 1 (group) X 9 (standardized dependent variables) MANOVA was conducted. This model revealed a highly significant multivariate main effect for group (Wilks’ Λ = 0.441, F [18, 160] = 4.498, p < .001, partial η2 = 0.336). Tests of between-subjects effects yielded significant group effects for substantiality (F [2, 91] = 3.719, p = 0.028, partial η2 = 0.078), differentiation (F [2, 91] = 26.470, p < 0.001, partial η2 = 0.376), level of self-definition (F [2, 91] = 25.822, p < 0.001, partial η2 = 0.370), sense of agency negative-positive self-regard (F [2, 91] = 11.984, p < 0.001, partial η2 = 0.214), sense of agency striving (F [2, 91] = 8.249, p = 0.001, partial η2 = 0.158), quality of relatedness (F [2, 91] = 6.363, p = 0.003, partial η2 = 0.126), and level of relatedness (F [2, 91] = 14.508, p < .001, partial η2 = 0.248). Tests of between-subjects effects for sense of agency self-critical (F [2, 91] = 2.118, p = 0.126, partial η2 = 0.046) and articulation of relatedness (F [2, 91] = 1.111, p = 0.334, partial η2 = 0.025) were not significant. Simple multivariate contrasts, with the schizophrenia group as the comparison group, revealed significant differences in the hypothesized direction between schizophrenia patients and controls on quality of relatedness (contrast estimate = 1.273, p = .001), level of relatedness (contrast estimate = 1.859, p > .001), substantiality (contrast estimate = 0.578, p = .008), level of self-definition (contrast estimate = 2.750, p > .001), sense of agency negative-positive (contrast estimate = 1.337, p > .001), sense of agency striving/ambitious (contrast estimate = 0.863, p > .001), and differentiation/integration (contrast estimate = 2.062, p > .001). Additionally, multivariate contrasts revealed significant differences in the
hypothesized direction between schizophrenia patients and bipolar patients on level of relatedness (contrast estimate = 0.871, p = .030), level of self definition (contrast estimate = 1.676, p > .001), and sense of agency negative-positive (contrast estimate = 0.802, p = .014).

Follow-up Multivariate Analysis of Covariance.

To examine differences between the schizophrenia and bipolar patient groups on the sense of self variables found to be significantly different in the previous analysis (level of relatedness, level of self definition, and sense of agency negative-positive) when overall level of pathology (PANSS and GAF) was otherwise accounted for, a 1 (group) x 3 (standardized dependent variables) MANCOVA was conducted. The GAF and Total PANSS Score were entered as covariates in the first block of the analysis, with the sense of self scale scores entered in the second block. With all variables in the model, a significant multivariate main effect for group was observed (Wilks’ Λ = 0.850, F [3, 51] = 2.993, p = .039, partial η2 = 0.213). Tests of between-subjects effects yielded significant group effects for level of relatedness (F [3, 57] = 5.246, p = 0.003, partial η2 = 0.229), level of self-definition (F [3, 57] = 5.822, p = 0.010, partial η2 = 0.192), and sense of agency negative-positive (F [3, 57] = 5.386, p = 0.003, partial η2 = 0.234).

Sense of Self Scores and Specific Phenomena in the Schizophrenia Group.

The nine sense of self scores were first examined continuously with the emotion perception, source-monitoring, and social functioning variables (see Table 5) using
bivariate correlations (Pearson’s \( r \)). This analysis yielded significant, but modest, correlations in the hypothesized direction for some of the specific social functioning variables. Score on the Interpersonal Functioning variable was significantly correlated with the sense of agency striving score (\( r = .362, p = .011 \)). Score on the Prosocial variable was significantly correlated with the sense of agency negative-positive score (\( r = .384, p > .001 \)) and the agency self-critical score (\( r = .307, p = .034 \)). Score on the Social Engagement variable was significantly correlated with the agency self-critical score (\( r = .384, p = .007 \)). Sense of self scale scores were not significantly related to emotion perception or source monitoring. These results appear in Table 5.
To further elucidate the relationship of sense of self to the variables of interest, index scores\(^2\) for agency, relatedness, and differentiation were calculated and appear in Table 1. The index scores were examined continuously with emotion perception, source-monitoring, and social functioning variables. None of the index scores were related to emotion perception or source monitoring. In regards to social functioning, agency was related to Interpersonal Functioning (\(r = .292, p = .044\)), and Prosocial Behavior was associated with both agency (\(r = .354, p = .014\)) and relatedness (\(r = .328, p = .023\)). Differentiation was not related to social functioning. It is important to consider that due to multiple comparisons, these significant findings may represent chance. These results appear in Table 5.

To examine the differences between extreme groups on each index score, the top and bottom quartile of scores on each index were formed into high and low score groups for agency, relatedness, and differentiation. Descriptive statistics for the extreme groups on each variable appear in Tables 6-8. The differences between high and low groups for each index score were then examined on the same dependent variables (emotion perception, source-monitoring, and social functioning) using independent t-tests.

Participants in the low agency group had significantly lower scores on Interpersonal Functioning (\(t(23) = -2.017, p = .05\)) and lower scores on the source-monitoring task at a trend level (\(t(23) = -2.067, p = .051\)). Emotion perception was not significantly different between low and high agency groups. The low relatedness group demonstrated trend-level associations with lower Prosocial behavior (\(t(23) = -1.919, p = .068\)) and

\(^2\) A more detailed explanation of the index scores appears in the Methods section.
higher scores on the Ekman Faces task ($t(25) = 2.013, p = .055$). The low and high relatedness groups did not differ significantly on source monitoring performance. No significant group differences were found between the high and low differentiation groups on emotion perception, source monitoring, or social functioning variables. These results appear in Tables 6-8.

### Table 6: T-test Results for Agency Score Extreme Groups

<table>
<thead>
<tr>
<th></th>
<th>Low Agency</th>
<th>High Agency</th>
<th>$t(23)$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agency Index</strong></td>
<td>7.79</td>
<td>14.43</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td><strong>Emotion Perception</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Ekman Faces</em></td>
<td>22.41</td>
<td>21.08</td>
<td>0.513</td>
<td>0.613</td>
</tr>
<tr>
<td><em>BLERT</em></td>
<td>14.25</td>
<td>13.15</td>
<td>0.548</td>
<td>0.548</td>
</tr>
<tr>
<td><strong>Source-Monitoring</strong></td>
<td>12.67</td>
<td>15.33</td>
<td>-1.827</td>
<td>0.081</td>
</tr>
<tr>
<td><strong>Social Functioning</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Prosocial</em></td>
<td>102.58</td>
<td>112.73</td>
<td>-1.689</td>
<td>0.105</td>
</tr>
<tr>
<td><em>Social Engagement</em></td>
<td>99.21</td>
<td>99.92</td>
<td>-0.150</td>
<td>0.882</td>
</tr>
<tr>
<td><em>Interpersonal Eff.</em></td>
<td>109.75</td>
<td>126.39</td>
<td>-4.068</td>
<td>&lt;0.001**</td>
</tr>
</tbody>
</table>
Table 7: T-test Results for Relatedness Score Extreme Groups

<table>
<thead>
<tr>
<th></th>
<th>Low Rel.</th>
<th></th>
<th>High Rel.</th>
<th></th>
<th>t(25)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relatedness Index</td>
<td>9.23</td>
<td>1.24</td>
<td>15.93</td>
<td>1.73</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Emotion Perception</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ekman Faces</td>
<td>24.46</td>
<td>4.03</td>
<td>20.50</td>
<td>5.93</td>
<td>2.013</td>
<td>0.055</td>
</tr>
<tr>
<td>BLERT</td>
<td>14.15</td>
<td>2.47</td>
<td>12.57</td>
<td>3.69</td>
<td>1.296</td>
<td>0.207</td>
</tr>
<tr>
<td>Source-Monitoring</td>
<td>13.58</td>
<td>3.34</td>
<td>12.92</td>
<td>3.27</td>
<td>0.498</td>
<td>0.623</td>
</tr>
<tr>
<td>Social Functioning</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prosocial</td>
<td>100.23</td>
<td>20.58</td>
<td>112.29</td>
<td>14.12</td>
<td>-1.737</td>
<td>0.096</td>
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<tr>
<td>Social Engagement</td>
<td>99.91</td>
<td>14.42</td>
<td>103.18</td>
<td>11.93</td>
<td>-0.621</td>
<td>0.541</td>
</tr>
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<td>Interpersonal Eff.</td>
<td>118.09</td>
<td>15.80</td>
<td>124.00</td>
<td>15.11</td>
<td>-0.951</td>
<td>0.351</td>
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</tbody>
</table>

Table 8: T-test Results for Differentiation Score Extreme Groups

<table>
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<tr>
<th></th>
<th>Low Diff.</th>
<th></th>
<th>High Diff.</th>
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<th>t(28)</th>
<th>p</th>
</tr>
</thead>
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<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diff. Index</td>
<td>4.20</td>
<td>1.01</td>
<td>8.40</td>
<td>0.74</td>
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<td>--</td>
</tr>
<tr>
<td>Emotion Perception</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ekman Faces</td>
<td>21.20</td>
<td>4.91</td>
<td>21.47</td>
<td>5.39</td>
<td>-0.141</td>
<td>0.889</td>
</tr>
<tr>
<td>BLERT</td>
<td>12.33</td>
<td>3.18</td>
<td>13.60</td>
<td>3.79</td>
<td>-0.991</td>
<td>0.330</td>
</tr>
<tr>
<td>Source-Monitoring</td>
<td>13.78</td>
<td>4.14</td>
<td>12.33</td>
<td>3.54</td>
<td>1.018</td>
<td>0.318</td>
</tr>
<tr>
<td>Social Functioning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prosocial</td>
<td>108.87</td>
<td>12.14</td>
<td>106.47</td>
<td>16.36</td>
<td>0.456</td>
<td>0.652</td>
</tr>
<tr>
<td>Social Engagement</td>
<td>101.13</td>
<td>14.17</td>
<td>100.77</td>
<td>10.96</td>
<td>0.079</td>
<td>0.937</td>
</tr>
<tr>
<td>Interpersonal Eff.</td>
<td>113.07</td>
<td>14.41</td>
<td>121.47</td>
<td>14.72</td>
<td>-1.580</td>
<td>0.125</td>
</tr>
</tbody>
</table>
DISCUSSION

Summary of Findings.

The main findings of the present study are: 1) schizophrenia patients scored significantly lower on all of the sense of self scale scores compared to healthy controls except for articulation of relatedness and agency self-critical; 2) schizophrenia patients scored significantly lower on the level of relatedness, level of self-definition, and agency negative-positive sense of self scales compared with bipolar patients; 3) the significant sense of self scale score differences between the schizophrenia and bipolar patient groups remained significant when overall level of functioning and psychiatric symptoms were included in the model as covariates; 4) the individual sense of self scale scores were related at low levels to specific social functioning variables, but not source-monitoring or emotion perception, in the schizophrenia patient group; 5) extreme low scores on the agency index were associated with lower Interpersonal Functioning and, at a trend level, poorer source-monitoring performance; 6) extreme low scores on the relatedness index were related, at a trend level, to lower Prosocial behavior and higher scores on the Ekman Emotional Faces Task; 7) no significant differences were observed between low and high differentiation index groups on any of the social functioning, emotion perception, or source-monitoring variables.
Interpretation of Findings.

The present study demonstrated significant support for our first hypothesis: schizophrenia patients demonstrated deficient sense of self as measured by the sense of self scales compared to healthy controls. This finding is consistent with previous research demonstrating that schizophrenia patients have a deficient sense of self compared to healthy controls (Docherty et al., 1998; Nelson, Sass, et al., 2009; Rhinewine, 2004). Our findings also demonstrate that sense of self in patients with schizophrenia was deficient in terms of specific aspects of relatedness, self-definition, and negative-positive self-regard compared to patients with psychotic bipolar disorder. Additionally, when psychiatric symptoms and global functioning were otherwise accounted for, these components of sense of self remained significantly different between patient groups. This finding indicates that observed group differences between schizophrenia and bipolar patient groups on the sense of self scale scores are unlikely to be due solely to differences in overall pathology or functioning.

Our findings provided limited support for some of our hypotheses regarding the relationship between the individual sense of self scale scores and the specific phenomena of interest in the schizophrenia patient group. When the sense of self scale scores were examined continuously, modest relationships were found with certain social functioning variables. Specifically, higher scores on the agency self-critical scale and the agency negative-positive self regard scale were related to higher scores on Prosocial Behavior at the $p < .05$ level. Additionally, higher scores on the Social Engagement social functioning scale were associated with higher scores on the agency
self-critical scale. No significant associations were found between the individual sense of self scale scores and emotion perception or source-monitoring.

To further investigate potential relationships between the sense of self variables and source-monitoring, emotion perception, and social functioning, we performed exploratory follow-up analyses with index scores of agency, differentiation, and relatedness as calculated from specific sense of self subscales. We assessed group differences for extreme scorers (top and bottom quartile of scores) for each index score variable. These analyses revealed that poorer performance on source-monitoring was associated, at a trend level, with lower scores of agency. This was consistent with our initial hypotheses.

Analyses of extreme index score groups also revealed significant differences at the p < .05 level related to social functioning. More specifically, the low agency group demonstrated significantly lower scores on Prosocial Behavior and Interpersonal Functioning; the low relatedness group demonstrated a trend for lower Prosocial Behavior scores. Similar to the source-monitoring results, agency appears to have been the component of sense of self most associated with social functioning. While difficulties with personal agency would logically be related to deficient social interactions, it is difficult to further investigate this finding with the measures included in the present study. Theoretically, however, it is possible that a deficient sense of self may contribute to social withdrawal or indifference due to existential confusion. Should one become preoccupied with the disruption in a basic and fundamental level of the self, it is not unreasonable to predict that the ability to function socially would be notably impaired. As
eloquently expressed by Carol Kean (2009) in her first-person account of living with schizophrenia:

If one is unable to enjoy a consistent and continuous sense of self, it is naturally difficult for him to express his inner turmoil. When the very elementary basis of self-experience is disrupted, communicating to, and participating with, others will automatically seem secondary, even insignificant. What is the purpose of volition when one is no longer himself? When nothing is real, even one’s own self, how can anybody expect him to show a normal range of feelings toward others? (p. 2).

Unsupported Hypotheses.

It is also important to acknowledge the portions of our hypotheses that were not supported by the present study. While the majority of the sense of self subscales significantly differentiated the schizophrenia patient and healthy control groups, only three of these same sense of self variables (level of relatedness, level of self-definition, and agency negative-positive self-regard) were significantly different between the schizophrenia and bipolar patient groups. This finding indicates that while the schizophrenia patients did exhibit some significant sense of self differences compared to bipolar patients, the groups were comparable in terms of differentiation, substantiality, articulation and quality of relatedness, striving, and self-criticism. While the primary goal of the present study was to assess group differences, the similarities observed between the psychiatric patient groups support the idea that certain aspects of the self may not be
specifically related to schizophrenic pathology, but to psychosis more broadly. Furthermore, the significant findings related to sense of self scale scores and specific phenomena in the schizophrenia group were limited, with the majority of these findings originating from secondary, exploratory analyses. Multiple comparisons were also obtained during the course of data analysis and most results were not significant; the results may contain Type-I error. Finally, performance on both the Emotional Faces Task and the BLERT emotion perception task was not significantly related to individual sense of self scale scores or index scores. These results suggest that sense of self is not related to emotion perception in schizophrenia. It is possible that emotion recognition processes in patients are not significantly impacted by sense of self disturbance, and that emotion perception difficulties are more related to domains not assessed in the present study.

*Theoretical Significance of Findings.*

The present study replicated previous findings that patients living with schizophrenia have an abnormal sense of self compared to healthy controls. The use of spontaneous self-descriptions in measuring sense of self allowed us to circumvent direct self-report by allowing subjects to respond in varying ways dependent upon their own self-understanding. This approach potentially ameliorates some of the measurement difficulties associated with self-report measures and their potential biases, which can be especially relevant in psychiatric populations (Atkinson, Zibin, & Chuang, 1997). Furthermore, the present study was important in providing additional evidence for the specificity of certain disruptions of sense of self to schizophrenia. Instead of being solely
associated with psychosis, the findings of the present study support the idea that aspects of sense of self are deficient in schizophrenia as compared to psychotic bipolar disorder. Additionally, when psychiatric symptoms and global functioning were otherwise accounted for, these specific components of sense of self remained significantly different between the patient groups. Given these findings, it appears that aspects of sense of self may be diagnostically useful in differentiating schizophrenia from another psychotic disorder. Recent research has indicated that schizophrenia and bipolar disorder are more similar than previously thought (Insel et al., 2010) in terms of cognitive and genetic profiles. However, the findings of the present study support the idea that more experiential components of the two disorders may be significantly different.

Specific sense of self scales associated with agency (i.e., level of self-definition, agency negative-positive self-regard) consistently emerged as significant differentiators of schizophrenia from psychotic bipolar illness. Level of relatedness was also a significant differentiator of the two patient groups. While the level of relatedness variable was not directly associated with the agency variables, the way it is defined in The Assessment of Self Descriptions manual requires that the rater take into account how the development of the self can potentially limit the development of personal relationships. For example, low scores on the level of relatedness indicate a poorly developed self concept that manifests as perceived fusion with or alienation from others, while high scores demonstrate capacity for mutuality in relationships and development of the self to

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3 See Methods section for a detailed explanation of the Level of Relatedness and other specific sense of self scales.
a level that allows intimacy and commitment. Given this definition and our findings, it is possible that compared to the other variables assessing relatedness (articulation of relatedness, quality of relatedness), the level of relatedness variable has a stronger association with the agency variables. While level of relatedness is correlated with the other variables assessing relatedness (articulation of relatedness, quality of relatedness), it appears that it is also relevant to assessing agency. As measured in this study, agency was the variable most directly reflective of the basic sense of self, while the other aspects of self (relatedness and differentiation) were expected to be deficient, but our findings suggest they may be not be as closely related to sense of self. In Sass & Parnas’ (2003) model of ipesity disturbance, which served as a theoretical foundation for the present study, agency is closest to their conceptualization of diminished self-affect, which is defined as “diminished intensity or vitality of one’s own subjective self-presence”.

When an individual is not able to understand the self as the agent of his/her own actions, feelings, or daily life, it follows that the person would experience significant difficulty in integrating experiences in a meaningful way, subsequent difficulty in goal setting, and a negative experience of the self. Realms of psychological research outside of phenomenology, such as neuroscience (Gallagher, 2000) and cognitive psychology (Kircher & Leube, 2003), also support the notion that agency is an important part of the self that is disrupted or distorted in schizophrenia. Agency has also been shown to be important in the formation of personal narratives in schizophrenia patients (Lysaker,

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4 See Introduction and Background for a more thorough description of this and other concepts related to the ipseity disturbance model.
Ringer, Maxwell, McGuire, & Lecomte, 2010). The finding in the present study that the sense of self variables related to agency were the most consistent differentiators of psychiatric diagnostic groups also supports the notion that disruptions to one’s sense of agency may be a trait-like marker of schizophrenic illness.

Limitations.

The present study has several notable limitations. First, only stable outpatients were included in the sample. Similar work with inpatients may yield different results. However, the inclusion of stable outpatients allowed us to examine participants with generally lower levels of acute positive symptoms, meaning our narratives and ultimately our findings were less influenced by this potentially complicating factor. Additionally, raters could not be blinded to diagnostic status of the participants when coding narratives. No participant information was included on the transcriptions of the self-descriptions, but participants sometimes mentioned their diagnoses or mental health treatment histories when completing the task. Multiple comparisons were also conducted with no statistical correction, and therefore the results must be interpreted very cautiously. Finally, the potential influence of formal thought disorder on the self-descriptions was not directly assessed. However, the outpatient participants were inherently in a less severe state of illness than might have been the case in a different patient group, and in general the raters did not encounter difficulty in understanding the narratives of the participants.
Future Directions.

The concept of sense of self merits continued attention as an important and potentially central component of schizophrenia. Additionally, the use of narrative to assess sense of self appears to be promising. Previous research utilizing narrative to assess sense of self (Docherty et al., 1998; Rhinewine, 2004) has shown evidence of diminished sense of self in schizophrenia probands and their non-schizophrenic relatives; future work may utilize similar methodology to examine sense of self in subclinical manifestations of schizophrenic illness (e.g., schizotypy).

As previously mentioned, the agency component of sense of self as measured in the present study is most similar to Sass & Parnas’ (2003) concept of diminished self affect. Future research may endeavor to incorporate both this element and the hyperreflexivity component of the ipseity disturbance model in order to better support the underlying theoretical foundations. For example, previous research has utilized self-report methodology to assess “self-disorders,” or anomalous self-experiences, that may be more reflective of the hyperreflexivity component. The inclusion of measures tapping more specifically into both facets of ipseity disturbance is crucial to further the empirical development of the theory.

Our current findings demonstrated some significant, yet modest, relationships between sense of self and both source monitoring and social functioning. Further work in this area should examine these relationships more specifically in order to better understand what associations may exist, and to potentially replicate the findings of the present study.
Some prominent researchers of self in schizophrenia warn of potential dangers in specific therapeutic treatments (Nelson et al., 2007). These researchers suggest that cognitive approaches may negatively impact schizophrenia patients given their deficient sense of self. Well-designed and soundly executed treatment studies of such therapies are especially relevant in light of these possibilities.

Further understanding of the sense of self as it pertains to schizophrenia also points towards the more consistent integration of the self into treatment of the disorder. Phenomenologically-oriented psychotherapies for schizophrenia are beginning to emerge (Perez-Alvarez, Garcia-Montes, Vallina-Fernandez, Perona-Garcelan, & Cuevas-Yust, 2011), and their further development and empirical testing are encouraged.
REFERENCES


of Copenhagen.


Clinical Psychiatry, 66(9), 1122-1129.