THE ROLE OF EMOTIONAL AWARENESS IN COGNITIVE-PERCEPTUAL DISTURBANCES IN SCHIZOTYPY

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ABSTRACT

One conceptualization of emotional awareness is described as attention to one's emotions and clarity of one's emotions. Clarity has been further divided into source awareness (i.e., knowing the causes of emotions) and type awareness (identifying actual emotions). Emotional awareness has been examined in relation to suspiciousness, one of four cognitive-perceptual disturbances in schizotypy. Studies have not, however, examined all three facets of emotional awareness in the other three cognitive-perceptual disturbances and have not examined attributional styles in conjunction with emotional awareness and their relation to cognitive-perceptual disturbances in schizotypy. In addition, previous studies have not examined self-report measures of emotional awareness in conjunction with behavioral/qualitative measures. The current study examined these factors using a cross-sectional design. In this study, 178 undergraduates completed self-report measures of emotional awareness, cognitive-perceptual disturbances, emotional arousal, and attributional style, in addition to completing behavioral tasks assessing type awareness and attention to emotions and a qualitative interview assessing source awareness. Results showed that low type awareness significantly predicted ideas of reference (after controlling for emotional arousal, source awareness, and attention to emotions) and suspiciousness (after controlling for sex, emotional arousal, attention, and source awareness). In addition, low internality for negative events was significantly associated with suspiciousness and odd beliefs/magical thinking. These findings build upon previous work in this area and have implications for potential treatments for cognitive and perceptual disturbances associated with schizotypy. Future directions for additional research are also discussed.

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CHAPTER 1

INTRODUCTION

Emotional awareness is a construct recently conceptualized as comprised of attention to emotions and clarity of emotions (Gross, 1998; Palmieri, Boden, & Berenbaum, 2009). Individually, low attention to and clarity of emotions have been associated with a variety of psychopathologies, including eating disorders, depression, and somatoform disorders (Flynn & Rudolph, 2014; Speranza, Loas, Wallier, & Corcos, 2007; Waller & Scheidt, 2004). Recently, emotional awareness (i.e., both attention to and clarity of emotions) also has been studied in regards to schizotypy (Berenbaum, Boden, & Baker, 2009). Schizotypy refers to a personality dimension ranging from normal dissociative states to more severe states related to (but not identical to) psychosis and schizophrenia (Meehl, 1962). Schizotypy has been conceptualized as being related directly to the diagnostic criteria for Schizotypal Personality Disorder, although schizotypal features have been observed in a variety of psychopathologies (Raine, 1991). Schizotypy has been associated with many negative outcomes, including problems with arousal, memory, attention, anhedonia, and increased risk for psychotic disorders (Laurent, Biloa-Tang, Bougerol, Duly, Anchisi, Bosson, et al., 2000; Lezenweger & Korfine, 1994). The literature examining emotional awareness and schizotypy is limited, and the current conceptualization of emotional awareness derives from decades of extant work in alexithymia and perceived emotional intelligence.

Alexithymia and Perceived Emotional Intelligence

The term ‘alexithymia’ was first proposed by Sifneos (1972) to refer to a personality trait characterized by marked difficulties with communicating with clinicians,

a concrete, externally oriented thinking style, a constriction in emotional functioning, and an inability to find appropriate words to describe feelings. The term derives from the Greek and literally means "a lack of words for mood" (*a* = lack, *lexis* = word, *thymos* = mood or emotion) (Nemiah & Sifneos, 1970; Sifneos, 1973). Alexithymia generally has been associated with a variety of negative outcomes in several populations, especially in individuals with eating disorders and somatoform disorders (Waller & Scheidt, 2004). In addition to being associated with somatoform and eating disorder diagnoses, illness severity, difficulties in facial recognition, body dissatisfaction, low self-esteem, and poor treatment outcomes (Bach & Bach, 1995; Carano, De Berardis, Gambi, DiPaolo, Campanella, Pelusi, et al., 2006; Cochrane, Brewerton, Wilson, & Hodges, 1993; DeGroot, Rodin, & Olmstead, 1995; Kessler, Schwarze, Filipic, Traue, & von Wietersheim, 2006; Mattila, Kronholm, Jula, Salminen, Koivisto, Mielonen, & Joukamaa, 2008; Pedrosa Gil, Ridout, Kessler, Neuffer, Schoechlin, Traue, & Nickel, 2009; Pinaquy, Chabrol, Simon, Louvet, & Barbe, 2003; Speranza, Loas, Wallier, & Corcos, 2007; Taylor, Parker, Bagby, & Bourke, 1996), alexithymia is also associated with psychosis spectrum disorders. Cognitive-perceptual disturbances, such as delusions and odd beliefs, in psychosis spectrum disorders have been linked to elevated levels of unpleasant emotions (Bentall et al., 2001) and mounting evidence suggests that individuals with psychosis spectrum disorders exhibit significant difficulties with emotional expression and emotion recognition (Phillips et al., 2003). Heshmati and colleagues (2010), for example, found that patients with psychosis spectrum disorders scored significantly higher than patients without psychiatric diagnoses on all three subscales of the Toronto Alexithymia Scale. The Toronto Alexithymia Scale (TAS-20) is

the most widely used instrument for the assessment of alexithymia (Bagby, Parker, & Taylor, 1994; Bagby, Taylor, & Parker, 1994). The TAS-20 is comprised of the following three subscales: difficulty identifying emotions (ID), difficulty describing emotions (DES), and externally oriented thinking (EOT).

Emotional intelligence, as defined by Salovey and Meyer (1990), is a theoretical construct related to social intelligence (indeed, the authors refer to emotional intelligence as a subset of social intelligence) and is characterized by an ability to monitor one's own and others' feelings and emotions, an ability to differentiate between different emotional states, and an ability to use this knowledge to inform cognitions and actions. Emotional intelligence, for example, has been theorized to be related to the appraisal and expression of emotions (Frijda, 1988; Roseman, 1984; Smith & Ellsworth, 1985; Weiner, 1985). In addition, emotional intelligence is hypothesized to be related to the perception of emotions in others and is related to the concept of empathy (Salovey & Mayer, 1990). Emotional intelligence also is related to the ability to regulate emotions in oneself and others (Salovey & Mayer, 1990). Specifically, the experiences an individual has about his or her own mood, or the meta-experiences of mood, could be the product of a theoretical system that monitors mood, evaluates mood, and potentially acts to change mood (Mayer & Gaschke, 1988). Meta-experiences of mood have been found to provide individuals with information about the causes of their moods, which may make them more or less likely to seek out pleasurable experiences and avoid unpleasant experiences (Salovey & Rodin, 1984; Tesser, Miller, & Moore, 1988). Perceived emotional intelligence is measured using the Trait Meta-Mood Scale (TMMS) (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). The TMMS is a 30-item measure comprised of three subscales:

Attention to Feelings (TMMS-Attention), Clarity of Feelings (TMMS-Clarity or Emotional Clarity), and Mood Repair (TMMS-Repair). Attention to Feelings refers to the extent to which individuals notice and think about their feelings. Emotional Clarity refers to the ability to understand one's mood. Mood Repair refers to the extent to which individuals moderate their moods.

Most research regarding the associations between perceived emotional intelligence and psychopathology has focused on the Emotional Clarity and Attention subscales of the TMMS. High levels of emotional clarity have been linked to adaptive coping and positive well-being (Gohm & Clore, 2000). Emotional clarity also has been shown to protect against depressive symptoms caused by some, but not all, stressors, among older adults (Kennedy et al., 2010). In contrast, low emotional clarity predicts maladaptive interpersonal responses to stress and depressive symptoms in youth (Flynn & Rudolph, 2010; Flynn & Rudolph, 2014; Sendzik, Schäfer, Samson, Naumann, & Tuschen-Caffier, 2017). In addition, students with high levels of emotional clarity show more adaptive problem-solving behavior with complex problems, and better performance on complex tasks than students low in emotional clarity (Otto & Lantermann, 2006). As assessed by the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), a lack of emotional clarity has been associated with a greater number of binge eating episodes (Whiteside, Chen, Neighbors, Hunter, Lo, & Larimer, 2007), chronic worry and symptoms of Generalized Anxiety Disorder (GAD) (Salters-Pedneault, Roemer, Tull, Rucker, & Mennin, 2006), and symptom severity in individuals with Post-Traumatic Stress Disorder (PTSD) (Ehring & Quack, 2010). Low emotional clarity has also been linked to schizophrena and psychosis spectrum disorders. Baslet, Termini, and

Herbener (2009), for example, found lower levels of emotional clarity in individuals diagnosed with schizophrenia spectrum disorders compared to a group of healthy individuals. In addition, higher levels of emotional clarity were associated with better quality of life for individuals diagnosed with schizophrenia spectrum disorders. Thus, it appears that low emotional clarity is associated with several psychopathologies, including depression, eating disorders, and psychosis spectrum disorders.

Although the Attention subscale of the TMMS has not received as much research focus as the Emotional Clarity subscale, researchers have found interesting associations among attention to one's emotions, emotional clarity, and psychopathology. Gilboa-Schechtman and colleagues (2006), for example, found that a sample comprised of individuals diagnosed with anorexia nervosa and bulimia nervosa reported significantly lower levels of attention to emotion and emotional clarity, the latter finding being consistent with previous research. In a study of individuals diagnosed with GAD and social anxiety disorder, Turk and colleagues (2005) found that individuals diagnosed with social anxiety reported paying less attention to their emotions than individuals diagnosed with GAD and healthy controls. Interestingly, no significant differences were observed between individuals with GAD and healthy controls on the TMMS-Attention subscale. Although low attention to emotions generally has been linked to negative outcomes and psychopathology, some research suggests that this finding may not be consistent with other outcomes. Specifically, greater attention to emotions has been associated with higher levels of magical thinking and peculiar beliefs (Berenbaum et al., 2006; Berenbaum, Boden, & Baker, 2009). High attention to emotions has also been associated with delusion severity in individuals diagnosed with schizophrenia spectrum disorders

(D'Antonio, Kahn, McKelvey, Berenbaum, & Serper, 2015). In another study, Thompson and colleagues (2007) found that high attention to one's emotions, but low clarity, was significantly associated with somatic symptoms.

Emotional Awareness

The extant work in alexithymia and perceived emotional intelligence (specifically, the TMMS-Clarity and TMMS-Attention subscales) suggests that there are conceptual overlaps between these two constructs. Indeed, previous studies suggest that alexithymia and perceived emotional intelligence are comprised of two underlying dimensions: attention to one's emotions and clarity of one's emotions. Davies and colleagues (1998), for example, found that the TMMS-Clarity subscale was more strongly associated with the TAS-ID subscale than it was with the TAS-EOT subscale. Other studies found that the TMMS-Clarity, TAS-ID, and TAS-DES subscales grouped together in one cluster, and the TMMS-Attention and TAS-EOT subscales grouped together in another cluster (Coffey, Berenbaum, & Kerns, 2003; Gohm & Clore, 2000; Gohm & Clore, 2002). In addition to these factors, Gohm and Clore (2002) found that the TAS-DES and the TMMS-Attention subscales significantly loaded on a separate factor (emotional expression).

Palmieri and colleagues (2009) noted that these analyses of the TAS and the TMMS are problematic because grouping these measures according to subscales does not measure the performance of individual items. Thus, potentially good items may be ignored because they are included in subscales with poor items. For these reasons, Palmieri and colleagues (2009) analyzed the subscales of the TAS and the TMMS using multidimensional scaling (MDS) and confirmatory factor analysis (CFA). MDS allows

researchers to determine which individual items from each subscale group together and then these groupings can be confirmed using CFA. In a sample of college students, emotional clarity was assessed by administering the TAS-ID and TMMS-Clarity subscales and attention to emotions was assessed by administering the TAS-EOT and the TMMS-Attention subscales. Together, attention and clarity comprise the construct of emotional awareness. Although the TAS-DES and the TAS-ID subscales have been found to be significantly correlated and to load on a mood identification factor in factor and cluster analyses of subscales scores, the TAS-DES subscale was not included in the analyses because the ability to communicate emotions is conceptually distinct from identifying emotions and from the overall construct of mood awareness. Results of the MDS and CFA analyses using the TAS-ID, TMMS-Clarity, TAS-EOT, and TMS-Attention subscales indeed produced two factors: Attention and Clarity. The Attention factor was comprised of 10 items (two from the TAS-EOT subscale and eight from the TMMS-Attention subscale) and the Clarity factor was comprised of 13 items (five from the TAS-ID subscale and eight from the TMMS-Clarity subscale). The Attention and Clarity scales showed high internal consistency ($\alpha = 0.87$ and 0.89, respectively) and were considered theoretically and psychometrically distinct from one another, as they correlated to a significantly lesser extent than did the clarity and attention scales formed from the relevant TAS and TMMS items, and correlated to a significantly lesser extent than the Clarity and Attention subscales of the TMMS.

An extension of this work examined potential additional factors in the concept of emotional awareness. Some studies have suggested that there are two facets of emotional clarity: source awareness and type awareness (Boden & Berenbaum, 2011; Baker,

Thomas, Thomas, & Owens, 2007). Boden and Berenbaum (2011) suggested that existing subscales of emotional clarity (i.e., the TMMS-Clarity and TAS-ID subscales) refer to the understanding of the types of emotions experienced by an individual. The authors, however, suggested that there are no extant measures assessing the extent to which people know the causes of their emotions. Previous research has suggested that knowing the source of one's emotions affects judgments and attributions (Gasper & Clore, 2000; Kehner, Locke, & Aurain, 1993); thus, the authors proposed that understanding the source of one's emotions is a crucial aspect of mood awareness. In order to distinguish between source and type awareness, Boden and Berenbaum (2011) administered the Clarity subscale developed by Palmieri and colleagues (2009), which is comprised of items from the TAS-ID and TMMS-Clarity subscales, and a measure of source awareness developed themselves to a sample of college students. The measure of source awareness was comprised of eight items and included items such as, "When I am sad, angry, or scared, I usually know who caused it," and "I often have to think for a while to figure out who made me sad, angry, or scared." Items pertaining to source and type awareness loaded on separate factors and each scale exhibited good internal consistency ($\alpha = 0.78$ and $\alpha = 0.89$ for source and type, respectively).

Emotional Awareness and Cognitive-Perceptual Disturbances in Schizotypy

As noted earlier, the experience of emotions has been shown to play an important role in and influence a variety of domains including attention, motivation, memory, judgments, and enacting behaviors (Clore, Gasper, & Garvin, 2001; Lowenstein, Weber, Hsee, & Welch, 2001; Matthews & Wells, 2002). As reviewed above, most of the research examining facets of emotional awareness (e.g., emotional clarity) generally

suggests that low clarity of and low attention to emotions is associated with a variety of negative outcomes, including depression, anxiety disorders, eating disorders, and somatoform disorders. Emotional awareness recently has been studied, however, in relation to some of the cognitive-perceptual disturbances (i.e., ideas of reference, odd beliefs/magical thinking, unusual perceptual experiences, and suspiciousness) associated with schizotypy.

As a clinical and research phenomenon, the concept of schizotypy has received much interest from researchers and clinicians hoping to elucidate the specifics of this multi-dimensional concept that is linked to psychosis-spectrum disorders generally and schizophrenia specifically. Schizotypy generally refers to a set of behavioral, cognitive, perceptual, and affective traits that are found in the general population (Meehl, 1990). Paul Meehl, whose work strongly influenced one conceptualization of schizotypy and its relation to schizophrenia, suggested a quasi-dimensional theory of schizotaxia, schizotypy, and schizophrenia. Meehl suggested that a necessary condition for schizotypy is the concept of schizotaxia (Meehl, 1962). According to this theory, schizotaxia is an integrative neural defect with genetic underpinnings. Meehl suggested that this neural defect is inherited and that the interaction of this neural defect with a social learning history produces a personality organization, which he called the schizotype. This theory also suggests that the most severe schizotypes develop clinical schizophrenia, possibly due to very poor parenting, traumatic events, or other factors. Although this theory does not suggest that all schizotypes develop clinical schizophrenia, it does suggest that the presence of a general schizotaxic vulnerability is necessary to develop schizotypy and, potentially, schizophrenia.

Another perspective on the nature of schizotypy is the dimensional approach, proposed by Hans Eysenck (Eysenck, 1975; Eysenck, 1976). According to this approach, schizotypy is not best conceptualized as a genetic vulnerability, but rather as a dimension of personality normally distributed in the population. Eysenck (1976) suggests that schizotypy lies on the continuum of psychoticism, with individuals experiencing full manifestations of psychosis occupying the higher end of this continuum. Some factor analyses have shown that schizotypy traits cluster in similar groups as do symptoms of schizophrenia (Raine, 1995) and other studies have shown that individuals scoring high on measures of schizotypy also meet criteria for schizophrenia spectrum disorders (e.g., schizophrenia, schizoid personality disorder, schizoaffective disorder), lending support to the dimensional view of schizotypy (Claridge, 1995).

One approach that integrates the quasi-dimensional approach and the dimensional approach is the fully dimensional approach (Claridge, 1995). According to this approach, schizotypy is a normally distributed dimension of personality, as in the Eysenck model. This model differs, however, because it regards schizophrenia as a 'psychotic breakdown' involving the experience of symptoms that might be present in schizotypy (e.g., positive symptoms), in addition to symptoms that are qualitatively distinct from schizotypy. This model, then, conceptualizes schizotypy on a graded continuum and the psychotic breakdown processes (ranging from schizotypal personality disorder to full schizophrenia) as existing on a second, independent, but also graded continuum (Claridge, 1995; Raine, 1995). Family studies suggest that positive and negative traits of individuals diagnosed with schizophrenia are associated with positive and negative traits in their relatives with schizotypy (Arendt, 2008). In addition, schizotypy has been found

to be a risk factor for schizophrenia (Mason, Startup, Halpin, Schall, Conrad, & Carr, 2004; Tyrka et al., 1995). Generally, then, schizotypy can be conceptualized as psychosis-proneness, or as a liability to schizophrenia.

Modern researchers have found support, through studies conducted in the United States and abroad, for organizing schizotypal traits according to three general factors: positive schizotypal traits, negative schizotypal traits, and disorganized schizotypal traits (Vollema & van den Bosch, 1995). Positive schizotypal traits include unusual perceptual experiences, odd beliefs and magical thinking, odd or eccentric behavior, suspiciousness, and ideas of reference. Negative schizotypal traits include excessive social anxiety, lack of close friends, and social isolation. Disorganized schizotypal traits include odd/eccentric thinking, odd/eccentric speech, and allusive thinking (i.e., subclinical loose associative processing). Some earlier studies of schizotypy have suggested a fourth factor, impulse nonconformity, but follow-up factor analytic studies have not found strong support for this factor and the three-factor model of schizotypy has been the most commonly investigated (Claridge, 1996; Ettinger, 2014).

Given the nature of the characteristics and traits theorized to comprise the construct of schizotypy, one major clinical phenomenon believed to be related to schizotypy is Schizotypal Personality Disorder (STPD). As defined by the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), STPD is defined as a "pervasive pattern of social and interpersonal deficits marked by acute discomfort with, and reduced capacity for, close relationships as well as by cognitive or perceptual distortions and eccentricities of behavior, beginning by early adulthood and present in a variety of contexts." (American Psychiatric Association, 2013). In order to be diagnosed

with DSM-5 STPD, at least five of the following symptoms must be present: ideas of reference, strange beliefs or magical thinking, abnormal perceptual experiences, strange thinking and speech, suspiciousness/paranoia, inappropriate or constricted affect, strange behavior or appearance, lack of close friends, and excessive social anxiety that does not abate and stems from paranoia rather than from negative judgments about self. In addition, the symptoms must not occur during the course of a disorder with similar symptoms, such as schizophrenia or autism spectrum disorder. Although the construct of schizotypy is closely related to STPD, it has been suggested that schizotypy and STPD are not isomorphic. Indeed, if schizotypy can be conceptualized as psychosis-proneness, then this proneness can express itself in a variety of ways, of which STPD and schizophrenia are just a few examples (Lenzenweger, 2015).

The literature on emotional awareness and schizotypy is limited but growing. In an undergraduate sample, Gasper and Clore (2000) found that emotions are more likely to influence judgments in individuals high in attention to emotions than for individuals low in attention to emotions. Kerns and Berenbaum (2000) found that individuals exhibiting cognitive-perceptual disturbances were influenced more strongly by the emotional valence of words, including by the emotional content of the words in the Emotional Stroop Task (EST) than individuals with lower levels of cognitive-perceptual disturbances (Berenbaum, Boden, Baker, Dizen, Thompson, & Abramowitz, 2006). Coffey and colleagues (2003) also found that higher attention to emotions was associated with being more strongly influenced by the emotional content of the EST. Kerns (2005) reported that higher levels of schizotypy were associated with increased attention to

emotions. Thus, it appears that increased attention to emotions is associated with cognitive-perceptual disturbances.

In a study examining college undergraduates, Berenbaum and colleagues (2006) found that high attention to emotions was significantly positively associated and emotional clarity was significantly negatively associated with cognitive-perceptual disturbances in schizotypy. In a separate study using a college undergraduate sample, Berenbaum, Boden, and Baker (2009) reported that high attention and high emotional clarity were associated significantly with odd beliefs/magical thinking when individuals rated tasks as emotionally salient (i.e., the authors found a significant three-way interaction among attention, emotional clarity, and salience). The authors explained these findings by suggesting that although being clear about one's emotions has been shown in previous studies to be adaptive, this may change depending on whether or not these odd beliefs/magical thinking arise in response to emotions whose informational value is misleading (e.g., if the emotion-eliciting event is considered unexpected and/or not having an explanation, or when an individual experiences an emotion that is not congruent with the event that engendered that emotion). In the only known study examining source and type emotional clarity in relation to cognitive-perceptual disturbances, Boden and Berenbaum (2012) found that low source and type emotional clarity were significantly negatively associated with suspiciousness after controlling for gender differences, attention, and various emotional states. Low attention to emotions was significantly associated with suspiciousness. The authors found no significant interactions among the different facets of emotional awareness.

In a sample of 225 community residents with elevated scores on questionnaires assessing schizotypal personality disorder, Berenbaum and colleagues (2006) found that individuals high in positive schizotypy reported greater attention to emotions and lower emotional clarity than individuals low in positive schizotypy. Kerns and Berenbaum (2000) found that college students with elevated scores on scales measuring magical thinking and unusual perceptual experiences exhibited increased sensitivity to affectively valenced prime words compared to a control group, which the authors interpreted as behavioral evidence for increased attention to emotions. This finding was replicated in a study by Kerns (2005), which found that individuals high in positive schizotypy reported greater attention to emotions and lower emotional clarity than a control group. In a study of psychiatric inpatients, Serper and Berenbaum (2008) found that low attention to emotions and low emotional clarity was associated with more severe ratings of hallucinations in patients diagnosed with psychosis spectrum disorders. The authors also found that low attention to emotions was associated with more severe delusion ratings in patients diagnosed with psychosis spectrum disorders. In a study of individuals diagnosed with schizophrenia and schizoaffective disorder, D'Antonio and colleagues (2015) found that delusion severity was significantly associated with higher levels of attention to emotions.

Taken together, these findings suggest that high attention to emotions and high (general) emotional clarity are associated with positive schizotypy (generally) and odd beliefs/magical thinking. Findings also suggest that low attention and low source and type emotional clarity are associated with suspiciousness. The relationship between

attention to emotions and delusion severity appears to still be a subject of debate and additional replication is necessary to clarify this relationship.

Attributional Style

Although source awareness provides information regarding an individual's perceptions of whether or not they know the source of their emotions, it does not provide information regarding the nature of this knowledge; the Source Awareness Scale (SAS; Boden & Berenbaum, 2011) does not include questions regarding an individual's attributions. It may be the case, for example, that individuals perceive that they know from where their emotions derive, but that they specifically attribute the source of their emotions to external circumstances. Although attributional style has not been studied in schizotypy, this has been examined in individuals with persecutory delusions and suspiciousness. Bentall and colleagues (1994), for example, proposed that patients with paranoid psychosis have negative views of themselves and that these negative views become activated when negative events occur. In addition, Bentall and colleagues (1994) suggested that unlike individuals with depression, patients with paranoia exhibit an externalizing bias (i.e., blaming circumstance as opposed to blaming oneself) and a personalizing bias (i.e., blaming others rather than circumstances). Some studies have supported the view that paranoia is associated with an externalizing attribution bias (Bentall, 2001; Candido & Romney, 1990; Kinderman & Bentall, 2000; Lyon, Kaney, & Bentall, 1994).

Although there is some evidence to support the view of an externalizing bias in individuals with persecutory delusions, there also is conflicting evidence. Some studies, for example, have not found the other two dimensions of attributional style (i.e., stability

and globality) to be associated with persecutory delusions (Garety & Freeman, 1999; Thompson, Bartholomeusz, & Yung, 2011). In addition, researchers have not consistently replicated findings by Bentall and colleagues (1994) and suggest that externalizing biases are not present in individuals with persecutory delusions (Humphreys & Barrowclough, 2006; Langdon, Still, Connors, Ward, & Catts, 2013). Other studies suggest that externalizing biases in persecutory delusions may exist as a function of the severity of the delusion; that is, the greater the belief in the persecutory delusion, the greater the externalizing bias (Bentall, Corcoran, Howard, & Blackwood, 2001; Sharp, Fear, & Healy, 1997). Taken together, results in the literature on attributional biases in persecutory delusions and suspiciousness are equivocal and warrant further investigation. Moreover, the relationships between attributional style and other cognitive-perceptual disturbances associated with schizotypy besides suspiciousness have not been examined yet.

The Present Study

The extant work on emotional awareness and its relationship to cognitive-perceptual disturbances (i.e., ideas of reference, odd beliefs/magical thinking, unusual perceptual experiences, and suspiciousness) in schizotypy has incrementally improved the body of literature in this area, but some issues still need to be addressed. First, of the four cognitive-perceptual disturbance areas of schizotypy, only suspiciousness has been studied in terms of source and type emotional clarity. Given that emotional clarity has been associated with overall cognitive-perceptual disturbances and with odd beliefs/magical thinking, there is evidence to suggest that examining both source and type emotional clarity and their relations to ideas of reference, unusual perceptual experiences,

and odd beliefs/magical thinking would further clarify this literature. The present study addressed this issue.

Second, studies have not systematically examined behavioral/qualitative measures of attention, type awareness, and source awareness in conjunction with self-report measures and their associations with the four cognitive-perceptual disturbance areas in schizotypy. Although self-report measures of emotional clarity and attention have contributed significantly to the literature, behavioral measures like the Emotional Stroop Task (EST) as a potential measure of attention to emotions, the Emotion Recognition Task (ERT) as a potential measure of type awareness, and Narrative of Emotions Task (NET) as a potential measure of source awareness, which have been used by schizophrenia researchers, would provide stronger support for potential associations between attention to and clarity of emotions and cognitive-perceptual disturbances in schizotypy. In this study, the EST, ERT, and NET were included as behavioral/qualitative measures of attention to emotions, type awareness, and source awareness, respectively, and their associations with both self-report measures of these constructs and the four dimensions of cognitive-perceptual disturbances in schizotypy were examined.

Attributional style has been examined in relation to persecutory delusions and the evidence for an attributional bias in persecutory delusions is equivocal. Some work has examined suspiciousness in relation to persecutory delusions and has yielded mixed results (Humphreys & Barrowclough, 2006). Given that attributional biases have not been examined in schizotypy specifically, the present study examined dimensions of attributional biases and their potential associations with the suspiciousness dimension of

schizotypy, and explored the associations between attributional style and the other cognitive-perceptual disturbances of schizotypy.

Specific Aims

Aim 1

The first aim of this study was to assess whether facets of emotional awareness (i.e., attention, type emotional clarity, and source emotional clarity), as operationalized by self-report and behavioral/qualitative measures, were associated with the four domains of the cognitive-perceptual disturbances dimension of schizotypy (i.e., ideas of reference, odd beliefs/magical thinking, suspiciousness, and unusual perceptual experiences).

Hypothesis 1a

Based on Boden and Berenbaum's (2012) findings and theorizing, low attention was hypothesized to be associated with suspiciousness and ideas of reference. Based on Berenbaum et al.'s (2009) findings, high attention was hypothesized to be associated with odd beliefs/magical thinking and unusual perceptual experiences.

Hypothesis 1b

Based on Boden and Berenbaum's (2009) theorizing, low source awareness was hypothesized to be associated with suspiciousness, ideas of reference, odd beliefs/magical thinking, and unusual perceptual experiences.

Hypothesis 1c

Low type awareness was hypothesized to be associated with suspiciousness and ideas of reference; high type awareness was hypothesized to be associated with odd beliefs/magical thinking and unusual perceptual experiences, based on Berenbaum et al.'s (2009) findings.

Hypothesis 1d:

The EST and ERT was hypothesized to be positively correlated with self-report measures of attention and type awareness (respectively) and to be associated with the four cognitive-perceptual domains as indicated in Hypotheses 1a-1c.

Aim 2

The second aim of this study was to assess whether the internality dimension of attributional style is associated with suspiciousness.

Hypothesis 2

Low internality was hypothesized to be associated with suspiciousness.

Exploratory Aims

Several exploratory aims were also examined.

Exploratory Aim 3a

Although the most recent study examining source awareness, type awareness, and attention did not find interactions among these three variables in predicting suspiciousness, the present study explored two-way and three-way interactions among these variables and their associations with the four cognitive-perceptual disturbances.

Exploratory Aim 3b

Although the literature suggests that the internality dimension of attributional style may be related to persecutory delusions (see above), this study also examined the stability and globality dimensions in relation to suspiciousness, which is the cognitive-perceptual disturbance most similar to persecutory delusions.

Exploratory Aim 3c

No study has examined attributional style dimensions in relation to the other three cognitive-perceptual disturbances associated with schizotypy. This study explored these relationships.

CHAPTER 2

METHOD

Recruitment

The current sample of 178 undergraduate students from Temple University was recruited through the Temple Psychology Research Participation System (http://temple.sona-systems.com/default.asp), "SONA Systems." SONA Systems is a HIPAA compliant online research management system. At the start of each semester, students enrolled in undergraduate psychology courses are invited to register on SONA Systems, through which they may participate in online research studies or sign up for lab studies in partial fulfillment of their course research requirements. On the SONA Systems website, students are presented with a list of available studies accompanied with brief descriptions of each. This study was listed under the title "Emotional Awareness Study." Flyers also were distributed throughout campus, advertising the study to students who were not enrolled in psychology courses. Participants emailed the investigator on a secure email account to schedule a session. Participants were included in the study if they: 1) were at least 18 years of age, and 2) could read/write/speak English fluently. Participants were excluded from the study if they were unwilling or unable to sign the informed consent document. After successful completion of the study session, participants who were enrolled in an undergraduate psychology course requiring research participation were offered their choice of 1 research credit or a $5 Amazon gift card. Non-psychology students who were not enrolled in a psychology course requiring research participation were compensated with a $5 Amazon gift card.

Participants

Participants (N = 178) in the final sample were 20.82 years old on average (SD = 3.68 years) and 76.4% female. In addition, 58.4% self-identified as White/Caucasian, 21.9% as Black/African American, 10.1% as Asian/Pacific Islander, and 9.6% as 'Other.' In our sample, 9.6% also identified as Hispanic/Latino (any race). In terms of socioeconomic status, 46.6% self-identified as middle class, 20.8% self-identified as upper-middle class, 15.7% self-identified as lower-middle class, 10.7% self-identified as working class, 5.1% declined to answer, and 1.1% self-identified as upper class.

Procedure

Eligible individuals participating in the cross-sectional study completed all questionnaires and behavioral/qualitative interview tasks in one 45-minute session. Participants first completed all self-report questionnaires, two behavioral tasks (i.e., EST and ERT), and then the qualitative interview (i.e., NET). Participants were compensated for their participation in the study. This study was approved by the Temple University Institutional Review Board (IRB).

Measures

In the Emotional Stroop Test (EST; Bentall & Kaney, 1989), which measures attention to emotions, participants were presented with words in various ink colors and were asked to ignore the meaning of the words and only name the colors of the ink. Participants' responses were timed and slow color naming is hypothesized to indicate selective attention to the meaning of the words. In this modified version originally used by Bentall and Kaney (1989), five types of stimuli were used: threat-related words (e.g., "deceit," "follow"), depression-related words (e.g., "defeat," "failure"), anxiety-related

words (e.g., “fearful,” “panic”), neutral words (“bud,” “recipe”), and meaningless strings of Os. Consistent with Bentall and Kaney (1989), participants were shown five cards grouped together by word type (i.e., one card for threat-related words, one card for depression-related words, one card for anxiety-related words, one card for neutral words, and one card with meaningless strings of Os). The reaction times for the threat-related words, depression-related words, and the anxiety-related words were added to produce an EST total score, consistent with other studies (e.g., Demily et al., 2008). A total score was calculated in order to increase the feasibility of the study (i.e., power analyses indicated that a much greater sample size would have been needed in order to analyze each reaction time score separately) and because this approach is consistent with other studies in the schizophrenia literature (Demily et al., 2008; Kemp, Silberstein, & Stough, 2001).

The Emotion Recognition Task (ERT; Montagne, Kessels, De Haan, & Perrett, 2007) measured type awareness. This task presented morphed faces for the six basic emotions at varying intensities. The emotions were presented from 0% (neutral face) to 100% (full emotion). The computer-generated faces changed intensity in 10% intervals. Participants were asked to identify the emotion expressed in each face as soon as they recognized it. This task produced two scores. The first score was calculated by adding the number of correctly labeled expressions for each emotion per intensity. The second score was an ERT total and was computed by adding the individual totals for each emotion. For this study, the ERT total score was used in all analyses.

The Narrative of Emotions Task (NET; Buck et al., 2014), a qualitative measure, was used to assess source awareness and consisted of an interview prompting participants to define a range of simple (happy, sad, angry, and afraid), complex (suspicious and

surprised), and self-conscious (guilty and ashamed) emotions. They were asked to define the emotion ("What does happy mean?"), provide a narrative account involving the emotion ("Tell me about a time when you felt happy.") and explain why the described event elicited the target emotion ("Why did that make you feel happy?"). The NET produced a variety of scores. For the purposes of this study, the 'Causal Inference' score was calculated. This score measured the extent to which individuals were able to provide a narrative account of an event that produced a particular emotion. Each answer was scored using the following criteria: 0 = no response or "I don't know"; 1 = causal circumstances that elicit the emotion are not present within the response, or they are not appropriately connected; 2 = causal circumstances that describe why an event elicited an emotion are explained, but only after the prompt is given; 3 = causal circumstances that explain why an event elicited an emotion are explained within the memory. The NET exhibited acceptable internal consistency ($\alpha = 0.78$).

The Emotional Attention Scale (EAS) (Palmieri et al., 2009) measured attention to emotions. The attention scale was comprised of 10 items (two from the Toronto Alexithymia Scale-Externally Oriented Thinking subscale and eight from the Trait Meta-Mood Scale-Attention subscale). Sample items included "Being in touch with emotions is essential" and "I often think about my feelings." Participants rated how much they agreed with each item on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). The attention scale exhibited good internal consistency ($\alpha = 0.83$).

The Type Awareness Scale (TAS) (Palmieri et al., 2009) measured type awareness/emotional clarity. The TAS was comprised of 13 items (five from the TAS-ID subscale and eight from the TMMS-Clarity subscale). Sample items included "I have

feelings that I can't quite identify" and "I am rarely confused about how I feel." Participants rated how much they agreed with each item on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). The TAS exhibited excellent internal consistency (α = 0.91).

The Source Awareness Scale (SAS) (Boden and Berenbaum, 2011) assessed source awareness/emotional clarity (i.e., source awareness). It was comprised of six items and included items such as, "It takes me a long time to figure out why I am happy or excited" and "I often have to think for a while to figure out who made me sad, angry, or scared." Participants rated how much they agreed with each item on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). The SAS exhibited acceptable internal consistency (α = 0.78).

Negative emotional arousal (i.e., anger, social anxiety, and anxious arousal) has been found to be inversely associated with emotional clarity and such arousal also has been found to be associated with cognitive-perceptual disturbances (Boden & Berenbaum, 2012). Thus, the following three measures of anger, anxious arousal, and social anxiety were added as control variables.

The Trait subscale of the State and Trait Anger Expression Inventory, 2nd edition (STAXI; Spielberger, 1996) measured anger and was comprised of 10 items. Participants indicated how they generally felt or reacted (e.g., "It makes me furious when I am criticized in front of others) using a 4-point Likert scale (1 = *almost never* to 4 = *almost always*). The scale exhibited good internal consistency (α = 0.80).

The Anxious Arousal subscale of the Mood and Anxiety Symptom Questionnaire (AA; Watson & Clark, 1991) measured anxious arousal. Participants responded to 17

items (e.g., “Startled easily”) using a 5-point Likert scale to indicate how they felt in the last week (1 = not at all to 5 = extremely). The scale exhibited good internal consistency ($\alpha = 0.83$).

The Social Avoidance and Distress Scale (SADS; Watson & Friend, 1969) measured social anxiety. Participants responded to 27 items (e.g., “Being introduced to people makes me tense and nervous”) as either being “*true*” or “*false*.” The scale exhibited excellent internal consistency ($\alpha = 0.92$).

The Attributional Style Questionnaire (ASQ; Peterson, Semmel, von Baeyer, Abramson, Metalsky, & Seligman, 1982) assessed attributional style. Participants were given 12 hypothetical events (half were positive and half were negative) and were asked to imagine that the event happened to them, decide what they believe the major cause of the event would be, write down a cause, answer questions about the cause, and answer one question about the situation. The measure produced scores for the positive and negative items on the following dimensions: internality, stability, and globality. For example, one item states, “You have been looking for a job unsuccessfully for some time.” Participants wrote down the cause of the event and were then asked, “Is the cause of your unsuccessful job search due to something about you or to something about other people or circumstances?” (internality). Participants rated this item on a 7-point Likert scale (1 = *totally due to other people or circumstances* to 7 = *totally due to me*). Participants were then asked, “In the future when looking for a job, will this cause again be present?” (stability). Participants rated this item on a 7-point Likert scale (1 = *will never again be present* to 7 = *will always be present*). Participants were then asked, “Is the cause something that just influences looking for a job or does it also influence other

areas of your life?" (globality). Participants rated this item on a 7-point Likert scale (1 = *influences just this particular situation* to 7 = *influences all situations in my life*). The scale exhibited acceptable internal consistency (α = 0.77 for both positive events and negative events).

The ideas of reference, unusual perceptual experiences, odd beliefs/magical thinking, and suspiciousness subscales of the Schizotypal Personality Questionnaire (SPQ; Raine, 1991) together comprise the cognitive-perceptual disturbances dimension of the SPQ and the dimension is comprised of 33 total items. Examples of items included, "Do you sometimes feel that things you see on the TV or read in the newspaper have a special meaning for you?" (ideas of reference), "Have you often mistaken objects or shadows for people, or noises for voices?" (unusual perceptual experiences), "Have you had experiences with the supernatural?" (odd beliefs/magical thinking), and "I am sure I am being talked about behind my back" (suspiciousness). Participants were asked to respond "*yes*" or "*no*" to each item. The total scale exhibited good internal consistency (α = 0.85). The ideas of reference subscale (α = 0.70), the odd beliefs/magical thinking subscale (α = 0.74), the unusual perceptual experiences subscale (α = 0.70), and the suspiciousness subscale (α = 0.75) all exhibited acceptable internal consistency.

Statistical Analyses

Preliminary Analyses

Preliminary analyses were conducted using SPSS Version 21.0 (IBM Corp., 2012). Specifically, *t*-tests examining gender differences in all study variables were conducted. We also conducted one-way ANOVAs examining potential racial and SES differences in all study variables. Bivariate correlations between all study variables also

were conducted. All analyses were conducted using the bootstrapping option available in SPSS with 1,000 samples, given that not all variables met assumptions for normality and log transformations of the data did not correct for these violations. Field (2009) recommends bootstrapping if transformations of the data do not correct for violations of normality. In addition, bootstrapping is better able to detect true differences and is easier to interpret than non-parametric tests.

Primary Hypothesis Testing Analyses

A series of hierarchical linear regressions were used to examine the associations between facets of emotional awareness and the four cognitive-perceptual domains. These linear regressions were modeled after Boden and Berenbaum (2012), given that this is the only other study (to the author's awareness) examining the three aspects of emotional awareness and one cognitive-perceptual disturbance (i.e., suspiciousness). For hypotheses 1a-1c, relevant demographic variables (those that were related to the emotional awareness and cognitive-perceptual dependent variables) and types of emotional arousal (i.e., anger, anxious arousal, and social anxiety) were entered in step one with one of the four cognitive-perceptual disturbances (i.e., suspiciousness, odd beliefs/magical thinking, ideas of reference, and unusual perceptual experiences) as the outcome variable. Negative emotional arousal (i.e., anger, anxious arousal, and social anxiety) has been found to be associated with cognitive-perceptual disturbances and also has been found to be inversely associated with emotional clarity (Berenbaum et al., 2006; Chadwick, Trower, Juusti-Butler, & Maguire, 2005); thus, consistent with the recommendations of Boden and Berenbaum (2012), these variables were entered as control variables. Self-report attention scores were entered in step two. Self-report type awareness scores were entered in step

three. Source awareness scores were entered in step four. For hypothesis 1d, these analyses were replicated with behavioral measures of attention and type awareness, as well as the qualitative interview measure of source awareness, replacing self-report measures of these constructs. For hypothesis 2, two hierarchical linear regressions were used to examine the association between the internality dimension of attributional style and suspiciousness. Relevant demographic variables, attention, source awareness, type awareness, and types of emotional arousal (i.e., anger, anxious arousal, and social anxiety) were entered in step one with suspiciousness as the outcome variable and internality for positive events was entered separately in step two. This analysis was replicated with internality for negative events entered in step two for the second linear regression. All analyses were conducted using bootstrapping, given that not all variables met assumptions for normality and log transformations of the data did not correct for these violations.

Exploratory Statistical Analyses

The hierarchical linear regressions for Hypotheses 1a-1c (Aim 1) included four steps. In order to test Exploratory Aim 3a, the following two-way interactions were entered in step five: type awareness x source awareness, type awareness x attention, and attention x source awareness. Finally, the type awareness x attention x source awareness three-way interaction was entered in step six. The hierarchical linear regression for Hypothesis 2 (Aim 2) included two steps. In order to test Exploratory Aim 3b, the stability and globality dimensions (separately for positive and negative events) were entered in step three. For Exploratory Aim 3c, each of the six attributional dimensions (i.e., internality, stability, and globality for positive and negative events) were entered

together in step two with each of the three other cognitive-perceptual disturbances (i.e., odd beliefs/magical thinking, unusual perceptual experiences, and ideas of reference) serving as the outcome variable. All analyses were conducted using bootstrapping, given that not all variables met assumptions for normality and log transformations of the data did not correct for these violations

CHAPTER 3

RESULTS

Preliminary Analyses

Bivariate correlations for all study variables are shown in Table 1.

Table 1
Bivariate correlations among study variables

Measure	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1. EST	---	-.01	-.21**	-.08	.11	.02	.17*	-.01	-.01
2. ERT	-.01	---	.11	.06	.07	.10	.12	.21**	-.02
3. NET	-.21**	.11	---	.01	-.07	-.02	-.14	.31**	.11
4. IOR	-.08	.06	.01	---	.31**	.45**	.42**	.08	-.22**
5. OBMT	.11	.07	-.07	.31**	---	.53**	.26**	.08	-.12
6. UPE	.02	.10	-.02	.45**	.53**	---	.35**	-.01	-.26**
7. Susp	.17*	.12	-.14	.42**	.26**	.35**	---	-.01	-.38**
8. EAS	-.01	.21**	.31**	.08	.08	-.01	-.01	---	.31**
9. TAS	-.01	-.02	.11	-.22**	-.12	-.26**	-.38**	.31**	---
10. SAS	-.08	-.03	.17*	-.01	-.03	.14	-.20**	.24**	.60**
11. AA	.19**	.10	-.01	.30**	.23**	.34**	.44**	.05	-.32**
12. SADS	-.04	.09	-.04	.20**	.02	.24**	.32**	-.14	-.30**
13. STAXI	-.06	-.01	-.06	.29**	.07	.29**	.40**	-.09	-.26**
14. ASQPI	-.07	.03	.09	-.07	-.05	-.06	-.05	.08	.10
15. ASQPS	-.11	-.02	.09	-.03	.05	.08	.01	.05	.05
16. ASQPG	-.20**	-.06	.14	.06	.01	.06	-.08	.03	.03
17. ASQNI	-.11	.06	.05	.01	-.15*	-.09	-.04	.09	-.12
18. ASQNS	-.08	.10	.20**	.11	.05	.09	.05	.10	-.04
19. ASQNG	-.08	.06	.06	.14	.10	.12	.03	.08	-.12

Note. *$p \leq .05$; **$p \leq .01$. EST = Emotional Stroop Task; ERT = Emotion Recognition Task; NET = Narrative of Emotions Task; IOR = Ideas of Reference Subscale from the Schizotypal Personality Questionnaire (SPQ); OBMT = Odd Beliefs/Magical Thinking subscale from the SPQ; UPE = Unusual Perceptual Experiences Subscale from the SPQ; Susp = Suspiciousness Subscale from the SPQ; EAS = Emotional Attention Scale; TAS = Type Awareness Scale; SAS = Source Awareness Scale; AA = Anxious Arousal Subscale from the Mood and Anxiety Symptom Questionnaire; SADS = Social Avoidance and Distress Scale; STAXI = Trait Subscale of the State and Trait Anger Expression Inventory; ASQPI = Internality Dimension for Positive Events from the Attributional Style Questionnaire (ASQ); ASQPS: Stability Dimension for Positive Events from the ASQ; ASQPG: Globality Dimension for Positive Events from the ASQ; ASQNI = Internality Dimension for Negative Events from the ASQ; ASQNS = Stability Dimension for Negative Events from the ASQ; ASQNG = Globality Dimension for Negative Events from the ASQ.

Table 1
Continued

Measure	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*

1. EST	-.08	.19**	-.04	-.06	-.07	-.11	-.20**	-.11	-.08	-.08
2. ERT	-.03	.10	.09	-.01	.03	-.02	-.06	.06	.10	.06
3. NET	.17*	-.01	-.04	-.06	.09	.09	.14	.05	.20**	.06
4. IOR	-.01	.30**	.20**	.29**	-.07	-.03	.06	.01	.11	.14
5. OBMT	-.03	.23**	.02	.07	-.05	.05	.01	-.15*	.05	.10
6. UPE	-.14	.34**	.24**	.29**	-.06	.08	.06	-.09	.09	.12
7. Susp	-.20**	.44**	.32**	.40**	-.05	.01	-.08	-.04	.05	.03
8. EAS	.24**	.05	-.14	-.09	.08	.05	.03	.09	.10	.08
9. TAS	.60**	-.32**	-.30**	-.26**	.10	.05	.03	-.12	-.04	-.12
10. SAS	---	-.19*	-.31**	-.10	.24**	.14	.06	-.17*	-.10	-.12
11. AA	-.19**	---	.32**	.42**	.01	-.02	.01	.06	.15	.10
12. SADS	-.31**	.32**	---	.27**	-.18*	-.08	-.07	.20**	.33**	.23**
13. STAXI	-.10	.42**	.27**	---	.12	.17*	.11	.06	.13	.11
14. ASQPI	.24**	.01	-.18*	.12	---	.62**	.31**	.03	-.12	-.22**
15. ASQPS	.14	-.02	-.08	.17*	.62**	---	.35**	.08	.06	-.13
16. ASQPG	.06	.01	-.07	.11	.31**	.35**	---	.12	.16*	.39**
17. ASQNI	-.17*	.06	.20**	.06	.03	.08	.12	---	.45**	.33**
18. ASQNS	-.10	.15	.33**	.13	.12	.06	.16*	.45**	---	.47**
19. ASQNG	-.12	.10	.23**	.11	-.22**	-.13	.39**	.33**	.47**	---

Of note, ERT and TAS scores were not significantly correlated. EST and EAS scores also were not significantly correlated. NET scores, however, were significantly associated with SAS scores in the expected direction. Gender differences were examined for all study variables. We found that women reported significantly higher levels of attention to emotions [$t(176) = 3.63$, $p < .01$)], higher levels of suspiciousness [$t(176) = 2.49$, $p < .01$)], and higher ERT scores [$t(176) = 2.81$ $p < .01$)]. No other significant gender differences were found. Results of ANOVAs also did not indicate any significant racial or SES differences across all study variables.

Primary Hypothesis Testing Analyses

For hypotheses 1a-d, low type awareness was found to significantly [$\Delta R^2 = .02$, $p < .05$; $F(6, 177) = 5.84$, $p < .01$] predict greater ideas of reference after controlling for emotional arousal and source awareness (see Table 2).

Table 2.
Regression analysis of attention, type awareness, and source awareness predicting ideas of reference, adjusting for negative emotional arousal (i.e., anxious arousal, social anxiety, and anger).

Step	Variable	*B*	*SE B*	95% BCa CI	R^2	ΔR^2
1st					.123**	.123**
	Anxious arousal	.058*	.024	[.012, .107]		
	Social anxiety	.031	.027	[-.022, .083]		
	Anger	.097*	.039	[.025, .177]		
2nd					.134	.011
	Attention	.043	.031	[-.018, .104]		
3rd					.151	.017
	Type awareness	-.041*	.021	[-.084, -.002]		
	Attention	.060	.034	[-.003, .132]		
4th					.170*	.019*
	Source awareness	.118	.066	[-.019, .242]		
	Type awareness	-.067**	.023	[-.114, -.021]		
	Attention	.057	.033	[-.005, .127]		

Note. *$p \leq .05$; **$p \leq .01$. Values are based on bootstrapping with 1,000 samples.

Low type awareness also significantly [$\Delta R^2 = .036$ $p < .01$; $F(6, 177) = 13.80$, $p < .01$] predicted suspiciousness after controlling for gender, emotional arousal, and attention to emotions, and this effect remained significant when source awareness was added to the model (B = -.06, $p \leq .01$, BCa CI [-.099, -.014]) (see Table 3).

Table 3

Regression analysis of attention, type awareness, and source awareness predicting suspiciousness, adjusting for gender and negative emotional arousal (i.e., anxious arousal, social anxiety, and anger).

Step	Variable	*B*	*SE B*	95% BCa CI	R^2	ΔR^2
1st					.290**	.290**
	Gender	.661*	.299	[.086, 1.248]		
	Anxious arousal	.077**	.020	[.039, .118]		
	Social anxiety	.052**	.020	[.015, .094]		
	Anger	.115**	.033	[.053, ..183]		
2nd					.290	.000
	Attention	-.006	.028	[-.061, .048]		
3rd					.326**	.036**
	Type awareness	-.054**	.018	[-.090, -.020]		
	Attention	.020	.031	[-.041, .084]		
4th					.327	.000
	Source awareness	.012	.045	[-.082, .098]		
	Type awareness	-.057**	.021	[-.099, -.014]		
	Attention	.020	.031	[-.042, .081]		

Note. *$p \leq .05$; **$p \leq .01$. Values are based on bootstrapping with 1,000 samples.

Type awareness did not significantly predict unusual perceptual experiences (B = -.03, *ns*, BCa CI [-.075, .005]) or odd beliefs/magical thinking (B = -.02, *ns*, BCa CI [-.070, .021]). Source awareness did not significantly predict ideas of reference (B = .12, *ns*, BCa CI [-.019, .242]), unusual perceptual experiences (B = .02, *ns*, BCa CI [-.076, .111]), odd beliefs/magical thinking (B = .02, *ns*, BCa CI [-.079, .122]) or suspiciousness (B = .01, *ns*, BCa CI [-.082, .098]). Attention to emotions did not significantly predict ideas of reference (B = .06, *ns*, BCa CI [-.005, .127]), odd beliefs/magical thinking (B = .02, *ns*, BCa CI [-.018, .060]), unusual perceptual experiences (B = .02, *ns*, BCa CI [-

.030, .059]), or suspiciousness (B = .02, *ns*, BCa CI [-.042, .081]). The ERT, EST, and NET also did not significantly predict ideas of reference {(B = .01, *ns*, BCa CI [-.032, .051]), (B = -.01, *ns*, BCa CI [-.020, .004]), and (B = -.00, *ns*, BCa CI [-.085, .064]), respectively}, unusual perceptual experiences {(B = .02, *ns*, BCa CI [-.016, .053]), (B = -.00, *ns*, BCa CI [-.009, .008]), and (B = -.00, *ns*, BCa CI [-.068, .055]), respectively}, odd beliefs/magical thinking {(B = .01, *ns*, BCa CI [-.034, .059]), (B = .00, *ns*, BCa CI [-.008, .013]), and (B = -.03, *ns*, BCa CI [-.084, .028]), respectively}, or suspiciousness {(B = .02, *ns*, BCa CI [-.018, .056]), (B = .01, *ns*, BCa CI [-.002, .017]), and (B = -.06, *ns*, BCa CI [-.145, .027]), respectively}.

For hypothesis 2, low internality for negative events significantly [$\Delta R^2 = .015$, $p < .05$; $F(8, 177) = 10.97$, $p < .01$] predicted greater suspiciousness after controlling for gender, emotional arousal, attention to emotions, source awareness, and type awareness. Internality for positive events was not associated with suspiciousness (B = -.02, *ns*, BCa CI [-.077, .036]).

Exploratory Statistical Analyses

Low internality for negative events significantly (B = -.06, $p < .05$, BCa CI [-.124, -.011]) predicted odd beliefs/magical thinking after controlling for emotional arousal, attention to emotions, source awareness, and type awareness. The positive internality (B = -.02, *ns*, BCa CI [-.086, .044]) negative stability (B = .01, *ns*, BCa CI [-.036, .051]), positive stability (B = .02, *ns*, BCa CI [-.032, .075]), negative globality (B = .02, *ns*, BCa CI [-.023, .064]), and positive globality (B = .00, *ns*, BCa CI [-.041, .047]) dimensions were not associated with odd beliefs/magical thinking. The negative stability (B = -.03, *ns*, BCa CI [-.081, .017]), positive stability (B = -.00, *ns*, BCa CI [-.057, .046]), negative

globality (B = -.03, *ns*, BCa CI [-.073, .019]), and positive globality (B = -.04, *ns*, BCa CI [-.096, .011]) dimensions were not associated with suspiciousness. The negative internality (B = -.07, *ns*, BCa CI [-.143, .010), positive internality (B = -.02, *ns*, BCa CI [-.114, .068]), negative stability (B = -.00, *ns*, BCa CI [-.049, .041]), positive stability (B = .03, *ns*, BCa CI [-.039, .090]), negative globality (B = .01, *ns*, BCa CI [-.034, .058]), and positive globality (B = .02, *ns*, BCa CI [-.031, .070]) dimensions were not associated with unusual perceptual experiences. The negative internality (B = -.03, *ns*, BCa CI [-.107, .056), positive internality (B = -.05, *ns*, BCa CI [-.130, .034]), negative stability (B = .01, *ns*, BCa CI [-.061, .067]), positive stability (B = -.03, *ns*, BCa CI [-.100, .038]), negative globality (B = .02, *ns*, BCa CI [-.033, .075]), and positive globality (B = .02, *ns*, BCa CI [-.048, .080]) dimensions also were not associated with ideas of reference.

The type x source (B = .01, *ns*, BCa CI [-.052, .069]), type x attention (B = .01, *ns*, BCa CI [-.034, .041]), attention x source (B = .03, *ns*, BCa CI [-.043, .098]), and type x attention x source (B = .00, *ns*, BCa CI [-.002, .001]) interactions were not significantly associated with ideas of reference. The type x source (B = .02, *ns*, BCa CI [-.044, .071]), type x attention (B = .02, *ns*, BCa CI [-.031, .041]), attention x source (B = .05, *ns*, BCa CI [-.039, .099]), and type x attention x source (B = .00, *ns*, BCa CI [-.001, .001]) interactions were not significantly associated with odd beliefs/magical thinking. The type x source (B = .03, *ns*, BCa CI [-.015, .070]), type x attention (B = .02, *ns*, BCa CI [-.010, .045]), attention x source (B = .03, *ns*, BCa CI [-.026, .079]), and type x attention x source (B = -.00, *ns*, BCa CI [-.002, .000]) interactions were not significantly associated with unusual perceptual experiences. The type x source (B = .01, *ns*, BCa CI [-.027, .050]), type x attention (B = .01, *ns*, BCa CI [-.011, .033]), attention x source (B = .02,

ns, BCa CI [-.026, .067]), and type x attention x source (B = .00, *ns*, BCa CI [-.001, .001]) interactions also were not significantly associated with suspiciousness.

CHAPTER 4

DISCUSSION

Given that previous research only has examined emotional awareness (i.e., attention to emotions, type awareness, and source awareness) in relation to suspiciousness, this study extended this previous work by exploring these aspects in relation to other cognitive-perceptual disturbances in schizotypy (i.e., ideas of reference, odd beliefs/magical thinking, unusual perceptual experiences), using both self-report and behavioral/qualitative measures. In addition, this study also examined attributional style in relation to all cognitive-perceptual disturbances.

Consistent with our hypotheses, low type awareness was significantly associated with ideas of reference and suspiciousness. The relationship between suspiciousness and type awareness replicated previous findings from a study examining emotional awareness and suspiciousness (Boden & Berenbaum, 2012). Also consistent with our hypotheses, low internality (for negative events) was significantly associated with suspiciousness and odd beliefs/magical thinking. Finally, although the behavioral and qualitative measures of type awareness, attention to emotions, and source awareness did not significantly predict cognitive-perceptual disturbances, the NET was significantly correlated with a self-report measure of source awareness. Unlike the other measures, the NET is qualitative in nature, and perhaps this difference accounts for the finding and underscores the importance of using similar qualitative measures in future studies. We did not find support for significant associations between other dimensions of attributional style and cognitive-perceptual disturbances. We also did not find evidence for significant two-way and three-way interactions of the emotional facets in predicting cognitive-perceptual disturbances.

The finding that low type awareness was significantly associated with ideas of reference and suspiciousness supported our hypotheses. These results suggest that difficulties identifying specific emotional states are associated with suspiciousness or ideas of reference. The ability to identify emotions can serve as a first step to learn how to cope with them, and this skill is also associated with decreased doubt regarding one's ability to recognize affective states (Wilson & Gilbert, 2008). Individuals who are emotionally aroused because of stimuli perceived to be unpleasant and who cannot identify what affective states they are experiencing might have difficulties learning how to manage these states and possess high doubt in their own abilities, thus maintaining and perhaps exacerbating these affective states. If the emotional content is particularly salient, confusion arising from what affective states are being experienced and pathological doubt in the ability to understand them might lead individuals to distort stimuli in their environment in the form of suspiciousness or ideas of reference. In regards to attributional style, low internality for negative events was significantly associated with suspiciousness (as predicted) and odd beliefs/magical thinking. Possessing an externalizing bias might make individuals more mistrustful of the world, especially when emotionally aroused negatively, thus contributing to pathological suspiciousness and odd beliefs/magical thinking.

In addition to the aforementioned results, several null findings were encountered. Source awareness and attention to emotions were not associated with any of the four cognitive-perceptual disturbances examined. In addition, none of the emotional awareness interaction variables were associated with cognitive-perceptual disturbances. As examined by Berenbaum and colleagues (2009) in relation to odd beliefs/magical

thinking, salience was found to moderate the relationship between type awareness and attention (source awareness was not examined), so perhaps examining this variable would provide more details about the relationship between emotional awareness and cognitive-perceptual disturbances. Low internality for negative events was associated with suspiciousness and odd beliefs/magical thinking; no other attributional style variables were associated with cognitive-perceptual disturbances. These results are not entirely surprising, given that there is no clear consensus in the literature regarding the nature of attributional styles in psychosis spectrum disorders. Finally, although the NET was significantly associated with a self-report measure of source awareness, none of the behavioral/qualitative measures were significantly associated with cognitive-perceptual disturbances in the regression analyses. The EST, however, was significantly correlated with suspiciousness and anxious arousal, and both the ERT and the NET were significantly correlated with the self-report measure of attention to emotions (see Table 1). To our knowledge, this is the first study examining behavioral/qualitative measures of emotional awareness and their relation to cognitive-perceptual disturbances in schizotypy. Other studies in the psychosis literature have found significant results using behavioral measures like the EST, just not while controlling for negative emotional arousal. Table 1 shows that all four cognitive-perceptual disturbances were significantly associated with the emotional arousal variables. Perhaps future studies in the psychosis and schizotypy literatures would benefit from including emotional arousal measures as controls; indeed, other researchers have suggested that including measures of negative emotional arousal is important, given the emerging evidence supporting the relationship

between negative emotional arousal and cognitive-perceptual disturbances (D'Antonio et al., 2015).

Future research is necessary to address several limitations of this study. First, researchers might obtain peer ratings of emotional awareness in addition to self-report and behavioral/ qualitative measures in order to obtain an additional dimension of type awareness, source awareness, and attention to emotions. Second, although the participants of this study were more diverse than the few previous studies examining emotional awareness and cognitive-perceptual disturbances, results might be more generalizable with a more diverse sample, especially a sample including more males. Third, previous work examining emotional clarity (generally defined) and one cognitive-perceptual disturbance (i.e., odd beliefs/magical thinking) suggests that salience might be a moderating factor in this relationship (Berenbaum et al., 2009). Perhaps source awareness, type awareness, and attention to emotions are variable depending on how relevant individuals find external stimuli to be. Berenbaum and colleagues (2009), for example, found that high type awareness was associated with odd beliefs (operationalized as a belief in a Chicago Cubs baseball curse) among individuals who identified as Chicago Cubs fans (the authors operationalized emotional salience as being a Cubs fan because the Cubs would be relevant to these individuals as opposed to individuals who did not identify as fans). Finally, longitudinal studies examining the development of emotional awareness in the context of cognitive-perceptual disturbances would be invaluable in elucidating this relationship.

If these results replicate in clinical samples, they would have implications for treatment of psychosis spectrum disorders. Treatments could be tailored to specifically

increase type awareness with individuals experiencing ideas of reference and suspiciousness. Treatment studies could examine whether or not focusing on emotional awareness leads to a decrease in the conviction associated with cognitive-perceptual disturbances and/or decreases in the subjective distress associated with these phenomena.

CHAPTER 5

EMOTIONAL AWARENESS: DEVELOPMENT OF A CONSTRUCT THROUGH ALEXITHYMIA AND EMOTIONAL INTELLIGENCE

Introduction

Emotional awareness is a construct that most recently has been defined as being comprised of attention to one's emotions and clarity of emotions (Palmieri, Boden, & Berenbaum, 2009). In addition, the emotional clarity component of emotional awareness has been studied most recently in terms of source and type awareness (Boden & Berenbaum, 2011). Although this specific conceptualization of emotional awareness (defined as being comprised of attention, source emotional clarity, and type emotional clarity) has received recent research attention, the concept of emotional awareness is not entirely new. Indeed, this construct derives from two other, highly researched areas of study: alexithymia and emotional intelligence. The purpose of this paper is to review the origins of the current definition of emotional awareness by comparing and contrasting alexithymia and emotional intelligence. Specifically, this paper will begin by presenting the origins of these constructs and the clinical and phenomenological characteristics of each. The paper then will review how these constructs have been measured and will present research regarding the psychometrics of the main instruments. Next, the paper will discuss how alexithymia and emotional intelligence differ from each other and share some similarities by being conceptualized as either a trait or a state/ability. The relationships between these constructs and major forms of psychopathology then will be reviewed, although it should be noted that only the most researched psychopathologies for each construct will be reviewed, as a comprehensive review of every

psychopathology is beyond the scope of this paper. Finally, the most recent research regarding the current conceptualization of emotional awareness will be reviewed.

Origins and Descriptions of Alexithymia and Emotional Intelligence

Alexithymia

The concept of alexithymia first came to the attention of clinicians and researchers in the 1960s after clinicians encountered difficulties with patients presenting with psychosomatic illnesses. Marty and de M'Uzan (1963) first described these patients as exhibiting the *pensée opératoire*. This term referred to the lack of an active fantasy life. Specifically, Marty and de M'Uzan (1963) proposed that patients exhibiting the *pensée opératoire* related mundane, trivial aspects of their everyday lives during psychotherapy sessions as opposed to inner attitudes, feelings, wishes, or drives; were unimaginative, focusing on concrete as opposed to abstract concepts; and generally displayed a utilitarian style of thinking. Patients exhibiting the *pensée opératoire* were diagnosed with a variety of illnesses, including ulcers, colitis, asthma, and hypertension.

In addition to exhibiting the *pensée opératoire*, patients with psychosomatic illnesses were described by other clinicians as also experiencing difficulties expressing their affect. In a series of reports generated from transcripts of psychotherapy sessions with a variety of patients with psychosomatic illnesses, Sifneos (1967) suggested that these patients appeared unable to describe how they felt and that they exhibited a limited vocabulary with regard to emotions. Additional reports from transcripts of psychotherapy sessions suggested that some patients with psychosomatic illnesses appeared to be unaware of their feelings, displayed inappropriate affect, and rarely cried (if crying was

present, the crying did not appear related to an appropriate feeling) (Apfel & Sifneos, 1979; Nemiah & Sifneos, 1970; Sifneos, 1973).

Given the repeated findings of the *pensée opératoire* and the difficulty with the expression of affect in patients with psychosomatic illnesses, Sifneos (1972) proposed the term 'alexithymia' to refer to a personality trait characterized by marked difficulties with communicating with clinicians; a concrete, externally oriented thinking style; a constriction in emotional functioning; and an inability to find appropriate words to describe feelings. The term derives from the Greek and literally means "a lack of words for mood" (*a* = lack, *lexis* = word, *thymos* = mood or emotion) (Nemiah & Sifneos, 1970; Sifneos, 1973). Clinical transcripts of psychotherapy sessions and clinician ratings of patients exhibiting alexithymic characteristics suggested that these patients could not make proper use of psychodynamic psychotherapy because of their lack of emotional awareness (Sifneos, 1975). Specifically, alexithymic patients were contrasted with traditional 'neurotic' patients and it was suggested that neurotic patients were better able to make use of traditional psychodynamic psychotherapy because they could give detailed descriptions of their emotional and interpersonal difficulties, describe their anxiety (or 'neurosis') in terms of cognitions and fantasies as opposed to physical sensations, use appropriate language to describe their emotions, and display affect appropriate to the therapeutic context (Apfel & Sifneos, 1979). In addition, Apfel and Sifneos (1979) suggested that clinicians experienced alexithymic patients as being dull, boring, tedious, and overly concerned with mundane and irrelevant details. By contrast, neurotic patients were considered to be experienced as interesting individuals with whom verbal communication was easily achieved. Nemiah (1970) conceptualized these clinical

differences by proposing that neurotic patients are able to reduce their resistances to defense mechanisms during insight-oriented therapy, thus leading to a reduction in symptoms. Alexithymic individuals, on the other hand, exhibit a deficit in their ability to reduce defenses (due to the *pensée opératoire* and their difficulties expressing emotions), which makes them poor candidates for insight-oriented psychotherapy.

Emotional Intelligence

Traditional conceptualizations of emotions and emotional experiences characterized emotions as disturbances and interruptions in mental activity (Young, 1943). Indeed, several authors proposed a view of emotions that suggested that emotions were aspects of psychic life that needed to be controlled and that could have negative consequences if not controlled, suggesting that emotions result from a lack of adjustment and indicate a complete loss of control (Woodworth, 1940; Young, 1936). An alternative view of emotions, however, suggests that emotions are adaptive because they help focus cognitive activity and aid the individual in taking action (Fredrickson, 2001). In this view, emotions are conceptualized as a motivating force and are actually helpful in directing cognitive activities adaptively. Given the alternative view of emotions as adaptive and potentially aiding an individual's personal and social experiences, Salovey and Meyer (1990) proposed that an individual's experience of emotions can be conceptualized as a form of intelligence, termed emotional intelligence.

Emotional intelligence, as defined by Salovey and Meyer (1990), is a theoretical construct related to social intelligence (indeed, the authors refer to emotional intelligence as a subset of social intelligence) and is characterized by an ability to monitor one's own and others' feelings and emotions, an ability to differentiate between different emotional

states, and an ability to use this knowledge to inform cognitions and actions. The rationale behind this conceptualization derives from work pertaining to several different aspects of the experience of emotions.

Emotional intelligence, for example, has been theorized as related to the appraisal and expression of emotions (Frijda, 1988; Roseman, 1984; Smith & Ellsworth, 1985; Weiner, 1985). Emotional learning is dependent on the ability to be able to speak clearly about emotions and has been associated with several positive outcomes, including leadership (George, 2000), greater flexibility in generating alternative solutions to problems (Mayer & Salovey, 1993), and generating future plans (Mayer, 1986). In addition, emotional intelligence is hypothesized to be related to the perception of emotions in others. As Salovey and Mayer (1990) point out, this aspect of emotional intelligence is related to the concept of empathy and may be an important characteristic of emotionally intelligent individuals. Research suggests that individuals who are able to empathize with others experience less stress and greater life satisfaction than individuals who are not able to empathize with others (Kessler, Price, & Wortman, 1985; Thoits, 1986). In addition, the ability to accurately identify emotions in others enables individuals to choose socially adaptive behaviors as a response to these differentiations (Hoffman, 1984).

Emotional intelligence also is related to the ability to regulate emotions in self and others (Salovey & Mayer, 1990). Specifically, the experiences an individual has about his or her own mood, or the meta-experiences of mood, could be the product of a theoretical system that monitors mood, evaluates mood, and potentially acts to change mood (Mayer & Gaschke, 1988). Meta-experiences of mood have been found to provide individuals

with information about the causes of their moods, which may make them more or less likely to seek out pleasurable experiences and avoid unpleasant experiences (Salovey & Rodin, 1984; Tesser, Miller, & Moore, 1988). In addition, meta-experiences of mood may intensify a person's positive or negative internal experiences and may increase the probability that individuals will approach others in a manner consistent with their positive internal emotional experience (in order to maintain positive mood) or in a manner that deviates from negative internal experience (in order to decrease negative or unpleasant mood states) (Cialdini & Kendrick, 1976; Minsky, 1985; Salovey & Rosenhan, 1989; Tesser, 1986; Tesser & Campbell, 1983).

Like cognition, emotional intelligence may make it more or less likely that individuals will use specific strategies when solving problems (Larsen, Diener, & Emmons, 1986). Research suggests, for example, that individuals in negative moods will perceive negative events as more likely to occur and positive events as less likely to occur, whereas individuals in positive moods will perceive negative events as less likely to occur and positive events as more likely to occur (Johnson & Tversky, 1983; Mayer & Bremer, 1985; Mayer, Mamberg, & Volanth, 1988; Mayer & Volanth, 1985; Salovey & Birnbaum, 1989). Changes in mood have been suggested to aid individuals in considering more options, especially when planning for the future (Mayer, 1986).

In addition to the effects of mood on flexible planning, utilizing emotional intelligence also may be helpful when considering creative thinking. For example, there is evidence to suggest that individuals experiencing positive moods are more likely to give unusual or creative responses to neutral cues than individuals experiencing negative moods (Isen, Daubman, & Nowicki, 1987). In addition, individuals experiencing positive

moods have been found to experience greater clarity when solving problems by being able to categorize aspects of a problem as being related or unrelated to the specific task at hand (Isen & Daubman, 1984). Individuals experiencing positive moods also have been found to make greater use of organizing principles and this appears to facilitate integrating and remembering information (Isen, 1990).

Finally, emotional intelligence also may be helpful when considering attention and motivation. Research has found that individuals experiencing moods of high intensity tend to refocus their attention to salient stimuli in their environment (Easterbrook, 1959; Frederickson & Branigan, 2005). The experience of moods, then, can help individuals to reconsider their priorities and direct attentional resources to relevant external and internal stimuli. Moods also have been found to be associated with motivation, and several studies suggest that both positive and negative moods affect motivation on tasks, which subsequently results in differences in performance (Bandura, 1986; Cantor, Norem, Niedenthal, Langston, & Bower, 1987; Kavanagh & Bower, 1985).

These descriptions of both alexithymia and emotional intelligence show that the constructs share some similarities, but are also distinct from each other. The constructs, for example, both include an ability to identify emotions in oneself and differentiate between emotional states. In the case of alexithymia, this is specified as an inability to do so, whereas emotional intelligence is characterized by being able to identify emotions and differentiate between emotional states. In addition, these initial descriptions of alexithymia and emotional intelligence appear to imply that these characteristics are constitutional in nature as opposed to learned. The emotional intelligence construct, however, appears to be related to other cognitive areas (e.g., creative thinking, planning)

and is described in terms of a greater number of additional constructs. In contrast, the initial descriptions of alexithymia appear strictly related to emotional content in clinical scenarios, although the inclusion of the *pensée opératoire* as a component of alexithymia also suggests that individuals with alexithymia may experience difficulties in areas in which individuals high in emotional intelligence may excel.

Measurement

Alexithymia

Beth Israel Psychosomatic Questionnaire (BIQ)

Given the rich clinical descriptions of alexithymia, various attempts have been made to systematically measure this clinical phenomenon. The first such measure created to assess this construct was the Beth Israel Psychosomatic Questionnaire (BIQ) (Sifneos, 1973). The BIQ is a forced-choice questionnaire comprised of 17 questions completed by a clinician. Eight of the 17 questions are considered to correspond to key features of alexithymia and the remaining nine ask the clinician for aspects associated with the construct of alexithymia but not considered to be fundamental to the concept. The eight key questions ask the clinician to answer "yes" or "no" to the following patient characteristics: the patient's ability to describe mundane details rather than feelings, the patient's inability to use appropriate words to describe their emotions, the absence of a rich fantasy life, the use of action to express emotions, the use of action to avoid conflicts, the tendency to describe the circumstances surrounding an event rather than feelings, a general inability to communicate, and the patient's tendency to exhibit thought content associated more with external events than with fantasy or emotion. The remaining nine questions, as stated above, ask the clinician to answer "yes" or "no" to

characteristics associated with alexithymia, including the patient's tendency to cry, the patient's tendency to exhibit inappropriate affect, and the presence of content relating to dreams. Data from clinical interviews showed that patients with psychosomatic illnesses scored more than twice as high on the BIQ than did healthy controls (Sifneos, 1973). Some researchers, however, have challenged the test's validity (Lolas, de la Parra, Aronsohn, & Collin, 1980). Specifically, Lolas and colleagues (1980) argued that the test's scoring procedure, which is entirely dependent on interactions between the patient and the clinician, is subject to bias on the part of the clinician. In addition, the style in which the clinician conducts the BIQ may have a large impact on eliciting affective material and this may not accurately reflect patients' inherent abilities to identify their emotions and use appropriate words to describe their affective states (Kleiger & Kinsman, 1980; Lolas et al., 1980).

Schalling-Sifneos Personality Scale (SSPS).

In addition to the BIQ, other questionnaires were developed in order to assess alexithymia in patient populations. The Schalling-Sifneos Personality Scale (SSPS) (Apfel & Sifneos, 1979) is a 20-item self-report questionnaire that asks patients to rate their perceptions of their thoughts and cognitive processes. Specifically, the SSPS is rated on a four-point Likert scale (A = Does not apply at all, B = Does not apply very much, C = Applies very much, D = Applies completely) and includes questions such as, "I find it hard to describe how I feel about people," "I prefer taking action rather than thinking," and "One may say that I lack imagination." Although the SSPS was developed to supplement the BIQ, little data exist regarding its validity or reliability (Lesser, 1981).

Patient questionnaire

Another questionnaire also was developed by Apfel and Sifneos (1979). This measure, which bears no formal name, is a 47-item questionnaire that asks the patient to answer a variety of questions relating to alexithymic characteristics. Examples of items include, "When you are upset, do you like to take action or do you prefer to think or daydream?" and "What do you do when you are happy? Where do you experience it? What is it like?" Like the SSPS, there are no normative data available for this 47-item questionnaire and there are no available reliability or validity studies.

Alexithymia scale of the Minnesota Multiphasic Personality Inventory (MMPI-A)

In an effort to create a psychometrically derived alexithymia scale from existing questionnaires, Kleiger and Kinsman (1980) compared scores on the Minnesota Multiphasic Personality Inventory (MMPI) with alexithymia scores on the BIQ and derived a 22-item MMPI alexithymia scale (MMPI-A). Although the MMPI-A initially was found to exhibit good internal reliability and temporal stability, other studies have not replicated the MMPI-A's internal reliability, and factor analyses suggest that factors derived from the items on the MMPI-A are poorly related to the theoretical domains of the alexithymia construct (Bagby, Parker, & Taylor, 1991).

Toronto Alexithymia Scale (TAS)

The most commonly used and psychometrically sound assessment of alexithymia is the Toronto Alexithymia Scale (TAS). The TAS originally was developed as a result of the absence of an existing psychometrically validated instrument to measure the alexithymia construct. As stated earlier, other instruments assessing alexithymia (e.g., BIQ, SSPS) were not constructed according to appropriate psychometric guidelines. The

first version of the TAS, the TAS-26, consisted of a 26-item scale comprised of four factors: difficulty identifying emotions (ID), difficulty describing emotions (DES), externally oriented thinking (EOT), and daydreaming (DD) (Taylor, Graeme, Ryan, David, & Bagby, 1985). Sample items comprising the ID factor of the TAS-26 included, "When I cry I always know why," and "I am often confused about what emotion I am feeling" Sample items comprising the DES factor included, "I'm able to describe my feelings easily," and "People tell me to describe my feelings more." Sample items comprising the EOT factor included, "I prefer to analyze problems rather than just to describe them," and "I prefer to just let things happen rather than to understand why they turned out that way." Finally, items comprising the DD factor included, "Daydreaming is a waste of time," and "I daydream rarely." The TAS-26 exhibited good internal consistency ($\alpha = 0.79$) and good test-retest reliability ($r = 0.82$, $p < 0.0001$). Although items assessing the extent of daydreaming loaded on one factor, Taylor and colleagues (1985) removed this subscale from the final questionnaire; the authors stated that clinical observations suggest that the quality, rather than the actual recall, of dreams is what actually distinguishes alexithymic individuals from non-alexithymic individuals and proposed that the dreams of alexithymic individuals lack the symbolism found in the dreams of non-alexithymic patients (Taylor, 1984). In studies attempting to differentiate alexithymic patients from non-alexithymic patients, the TAS-26 has been found to have good construct and criterion validity (Bagby, Taylor, & Parker, 1988).

In order to further assess the reliability and validity of the TAS-26, a new version was constructed to confirm its psychometric properties and its factor structure. The resulting instrument, the TAS-20, includes both new items and items previously included

in the first version (Bagby, Parker, & Taylor, 1994; Bagby, Taylor, & Parker, 1994). The TAS-20 exhibited good internal consistency ($\alpha = 0.81$), good convergent validity (as evidenced by significant negative correlations with openness to experience and significant positive correlations with neuroticism), good discriminant validity (as evidenced by nonsignificant correlations with agreeableness and conscientiousness), concurrent validity (as evidenced by significant positive correlations with the BIQ), and good test-retest reliability ($r = 0.77$, $p < 0.01$). In addition, the TAS-20 was comprised of a three-factor structure that included the ID, DES, and EOT subscales. Given that the DD subscale was not correlated with other aspects of the alexithymia construct, particularly the EOT subscale (Haviland, 1996), factor analyses were conducted and a three-factor solution comprised of ID, DES, and EOT fit the data best. Bagby and colleagues (1994) noted that a lack of daydreaming, originally conceptualized as part of the *pensée opératoire*, should theoretically be linked to externally-oriented thinking and that the failure of the DD subscale to correlate with the EOT subscale suggests that daydreaming alone may not capture the capacity for imaginal activities.

Of the measures created and used to assess alexithymia, the TAS-20 appears to be the most psychometrically sound instrument. Indeed, the TAS-20 has been translated into multiple languages and is used by researchers around the world. Although scores on the BIQ, SSPS, and the patient questionnaire asked both patients and clinicians for information, these instruments were later not found to be very reliable, mostly due to the excessively subjective nature of the scoring. These measures, however, provided rich clinical data based on observations and made the creation of the TAS-26 and TAS-20 possible. The TAS-26 and TAS-20 both are far more psychometrically sound than the

BIQ, SSPS, and the patient questionnaire because of the use of factor analysis as opposed to observational methods.

Emotional Intelligence

State Meta-Mood Scale (SMMS)

Mayer and Stevens (1994) developed the State Meta-Mood Scale (SMMS) to describe the expression of emotional content on the basis of different dimensions (e.g., Pleasant-Unpleasant, Positive-Tired, Aroused-Calm). This scale was developed to capture the two components of mood experience: the direct experience of a mood state and a meta-level experience of the mood state, which includes thoughts and feelings about the mood. As its name suggests, the SMMS was developed to capture the experience of transient moods and was not developed as a method to assess the experience of one's general tendency to experience moods and their associated thoughts and feelings. The SMMS exhibited good internal consistency ($\alpha = 0.75$ to 0.87 for SMMS subcales) and concurrent validity (as evidenced by significant correlations with TAS-20 subscales).

Trait Meta-Mood Scale (TMMS)

Given the absence of a measure assessing trait regulation of mood, Salovey, Meyer, Goldman, Turvey, and Palfai (1995) developed the Trait Meta-Mood Scale (TMMS) in order to assess stable individual differences in people's tendency to attend to their emotions, correctly discriminate among them, and regulate them. The TMMS is a 30-item measure comprised of three subscales: Attention to Feelings (TMMS-Attention), Clarity of Feelings (TMMS-Clarity or Emotional Clarity), and Mood Repair (TMMS-Repair). Attention to Feelings refers to the extent to which individuals notice and think

about their feelings. Items in the Attention to Feelings subscale include "I don't pay much attention to my feelings," and "I never give in to my emotions." Emotional Clarity refers to the ability to understand one's mood. Items in the Emotional Clarity subscale include "I am usually very clear about my feelings," and "I am rarely confused about how I feel." Mood Repair refers to the extent to which individuals moderate their moods. Items in the Mood Repair subscale include, "No matter how badly I feel, I try to think about pleasant things," and "Although I am sometimes sad, I have a mostly optimistic outlook."

The TMMS has demonstrated good internal consistency ($\alpha = 0.86$, 0.88, and 0.82 for TMMS-Attention, TMMS-Clarity, and TMMS-Repair, respectively) and test-retest reliability $r = .73$, $p < .01$) (Gorostiaga, Balluerka, Aritzeta, Haranburu, & Alonso-Arbiol, 2011; Salovey et al., 1995).

Emotional clarity

Difficulties in Emotion Regulation Scale (DERS). In addition to the Emotional Clarity subscale of the TMMS, a lack of emotional clarity has been measured by the Difficulties in Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004). The DERS measures various aspects of emotion dysregulation (as opposed to perceived emotional intelligence, which is measured by the TMMS) and is comprised of the following six subscales: Nonacceptance of Emotional Responses (Nonacceptance), Difficulties in Engaging in Goal-Directed Behavior (Goals), Impulse Control Difficulties (Impulse), Lack of Emotional Awareness (Awareness), Limited Access to Emotion Regulation Strategies (Strategies), and Lack of Emotional Clarity (Clarity). Items on the Clarity subscale of the DERS include, "I have difficulty making sense out of my feelings" and "I

am confused about how I feel." The DERS has been shown to have good internal consistency ($\alpha = 0.93$), good test-retest reliability ($r = .88$, $p < .01$), and good construct and predictive validity (as evidenced by significant correlations with another self-report measure of emotion regulation and significant associations with self-harm and partner abuse) (Gratz & Roemer, 2004).

Emotional Clarity Questionnaire (ECQ). The TMMS-Clarity subscale has been modified for use with children and adolescents. Flynn and Rudolph (2010) developed the Emotional Clarity Questionnaire (ECQ) for this purpose. The ECQ is a seven-item measure comprised of the seven highest-loading items on the original TMMS-Clarity subscale, which was originally comprised of 12 items. The wording of the original TMMS-items was modified in order to make them more comprehensible to children (e.g., "I can't make sense out of my feelings" was modified to "I often have a hard time understanding how I feel."). The ECQ has demonstrated good convergent validity (as evidenced by its associations with number of mistakes made during facial recognition tasks) and discriminant validity (as evidenced by low, nonsignificant correlations with teacher-reported academic performance).

Bar-On Emotional Quotient Inventory (Bar-On EQ-i)

The Bar-On Emotional Quotient Inventory (Bar-On EQ-i) is a self-report measure of emotional intelligence that measures an individual's understanding of oneself and others, the extent to which individuals adapt and cope with their environment, and the extent to which individuals can relate to others (Bar-On, 1997). The Bar-On EQ-i is comprised of 133 items on 15 subscales corresponding to five overall dimensions.

Instructions on the Bar-On EQ-i ask individuals to specify the degree to which statements accurately describe them on a 5-point scale (1 = *not true of me*, 5 = *true of me*).

A total score, in addition to subscale and dimension scores, are calculated for the Bar-On EQ-i. The dimensions and subscales are as follows: Intrapersonal (comprised of emotional self-awareness, assertiveness, self-regard, self-actualization, and independence), Interpersonal (comprised of empathy, interpersonal relationship, and social responsibility), Adaptation (comprised of problem solving, reality testing, and flexibility), Stress Management (comprised of stress tolerance and impulse control), and General Mood (comprised of happiness and optimism). The total Bar-On EQ-i score has demonstrated excellent internal consistency ($\alpha = 0.96$) and subscale/dimension scores have demonstrated internal consistencies ranging from $\alpha = 0.74$ to $\alpha = 0.93$ (Brackett & Mayer, 2003; Dawda & Hart, 2000).

Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT)

The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) was developed in order to assess ability emotional intelligence, which is defined as the mental processes implicated in recognizing, using, understanding, and managing one's and others' emotional states in order to solve problems and regulate behavior (Brackett & Salovey, 2006). The MSCEIT is comprised of 141 multiple-choice items divided among eight tasks. Two tasks correspond to each of the four branches in the four-branch model of emotional intelligence (described in detail later in this paper) (Mayer & Salovey, 1997).

The Perceiving Emotions branch of ability emotional intelligence asks individuals to identify emotions after viewing photographs of faces and to identify feelings

associated with landscapes and artistic designs (Brackett & Salovey, 2006). The Use of Emotion to Facilitate Thought branch is measured by asking individuals to associate feeling states with a sensory, non-feeling vocabulary and by asking individuals to identify emotions that would interfere with cognitive and behavioral tasks. The Understanding Emotion branch is assessed by asking individuals to analyze blended emotions and by assessing the extent to which an individual understands how emotions change over time. Finally, the Managing Emotions branch assesses how individuals manage the emotions of others and how an individual would regulate their own emotions. The MSCEIT has demonstrated excellent internal consistency ($\alpha = 0.91$), good discriminant validity (as evidenced by nonsignificant correlations with neuroticism, extraversion, and conscientiousness), and good convergent validity (as evidenced by significant correlations with verbal and perceptual/organizational intelligence (Ciarrochi, Chan, & Caputi, 2000; Mayer, Salovey, & Caruso, 2008).

Measures of emotional intelligence vary widely depending on whether the construct is conceptualized as an ability or a trait (described in the next section below). Generally, however, it appears that the TMMS and the Bar-On EQ-i are reliable and valid measures of trait emotional intelligence. The Bar-On EQ-i, however, expands upon concepts first proposed for the TMMS and captures a more holistic view of the construct than the TMMS. In contrast, the SMMS originally was created to measure transient mood states and one's overall ability to reflect on this mood. The MSCEIT is the most recent measure created to assess emotional intelligence as an ability and not a trait. Consistent with this conceptualization of emotional intelligence, the MSCEIT is performance based and does not rely on self-reports like the TMMS and Bar-On EQ-i. If emotional

intelligence is to be conceptualized as an ability (similar to traditional definitions of intelligence), then the use of the MSCEIT appears appropriate given its theoretical foundation and psychometric properties.

State/Ability Conceptualizations of Alexithymia and Emotional Intelligence

State Alexithymia

Significant controversy exists regarding whether alexithymia is best conceptualized as a stable personality trait or whether it is a state-dependent characteristic. The concept of alexithymia as constituting a transient phenomenon (i.e., state-dependent) was first explored by Freyberger (1977). Freyberger distinguished between primary and secondary alexithymia. Primary alexithymia was described as a personality characteristic that significantly interfered with traditional psychodynamic psychotherapy. Specifically, Freyberger (1977) suggested that, in accordance with traditional descriptions, alexithymic patients exhibit difficulties expressing their emotions, exhibit an impoverished fantasy life, fail to successfully create a therapeutic bond with the clinician, and their alexithymia is a major factor in the onset and maintenance of somatic disorders.

Freyberger (1977), however, suggested that supportive psychotherapy has, in some cases, been associated with an increase in emotional awareness and an increase in patients' abilities to verbalize their emotional experiences. Data from psychotherapy sessions with patients exhibiting a variety of somatic illnesses (e.g., myocardial infarction, ulcerative colitis) suggested that these individuals develop alexithymia as a defense mechanism against their somatic illnesses and that psychotherapy was associated with reductions in alexithymic characteristics. Freyberger (1977) termed this form of

alexithymia secondary alexithymia and suggested that it can be differentiated from primary alexithymia by its transitory nature.

Many studies have explored the nature of primary (i.e., trait) and secondary alexithymia (i.e., state-dependent) in the context of a variety of psychopathologies. In a study of inpatient alcoholics completing three weeks of treatment, Haviland and colleagues (1988) found that alexithymia (as measured by the TAS-26) was highly correlated with scores on the Beck Depression Inventory (BDI). In addition, these researchers found a reduction in alexithymic characteristics after treatment, although this reduction was not significant. Patients classified as non-alexithymic pre-treatment exhibited greater alexithymic characteristics after receiving treatment. Both groups exhibited significant reductions in BDI scores after treatment. The authors suggested that the decreases in alexithymic characteristics may suggest an activation of defense mechanisms as a result of emotional distress (i.e., depression) in order to reduce unpleasant moods and cognitions, which decrease once the patient no longer experiences emotional distress. The authors suggested that the increase in alexithymic characteristics is a result of depression initially overwhelming alexithymic defenses, only to be recovered once emotional distress declines. These interpretations are consistent with alexithymia as a secondary characteristic enabled as a response to emotional distress.

Other studies have found some support for this assertion. Wise, Jani, Kass, Sonnenschein, and Mann (1988) examined a sample of 75 medically ill patients seen in psychiatric consultation and found that although medical illness did not significantly predict alexithymia, living arrangement (living alone vs. living with others) and depression scores did significantly predict alexithymia scores. These results suggest that

alexithymia may be best conceptualized as a trait for individuals exhibiting some conditions (e.g., somatic illnesses), but may be secondary for individuals with depression. Results from a study by Keltikangas-Järvinen (1987), however, found contradictory findings. Specifically, Keltikangas-Järvinen (1987) found that individuals diagnosed with gastroenterological disorders exhibited less alexithymic characteristics as their conditions improved. Similarly, Wise, Mann, Mitchell, Hryvniak, and Hill (1990) found that quality of life significantly predicted alexithymic characteristics in a sample of medically ill individuals, suggesting that alexithymia may develop as a result of impairments and difficulties that result from medical conditions.

Studies of alexithymia and depression have provided further support for the suggestion that alexithymia may be a secondary response to emotional distress and/or adverse events. Hintikka, Honkalampi, Lehtonen, and Viinamäki (2001), for example, studied a large sample of individuals between the ages 25 and 64 to assess the relationships between alexithymia and depression. The researchers found that individual items on the TAS-20 and the BDI loaded on separate factors in individuals who were both non-alexithymic and non-depressed. When examining individuals who were alexithymic and depressed, however, the researchers found that individual items on the TAS-20 and the BDI significantly overlapped on several factors.

Given that most studies examining alexithymia are cross-sectional, the use of longitudinal designs has been lacking in the literature, although some studies have explored alexithymia with longitudinal designs. In one study, Honkalampi and colleagues (2010) found that alexithymia did not predict diagnoses of major depressive disorder, personality disorder, or alcohol use disorders over a 12-month follow-up, although it was

found to be significantly associated with symptoms of depression. In another 12-month longitudinal study, Honkalampi, Koivumaa-Honkanen, Tanskanen, Hintikka, Lehtonen, and Viinamäki (2001) found that the prevalence of alexithymia at baseline and follow-up did not statistically change. The researchers also reported that mean alexithymia and depression scores did not significantly differ at follow-up as compared to baseline. When analyzing the data using cutoff scores, Honkalampi and colleagues (2001) found that a significant proportion of participants were in a different TAS-20 category at follow-up as compared to baseline. These participants also exhibited changes in depression scores consistent with their changes in alexithymia status (e.g., participants considered alexithymic at baseline and non-alexithymic at follow-up exhibited decreases in depression scores).

Similar results have been obtained in studies examining patients with anxiety disorders. Fukunishi, Kikuchi, Wogan, and Takubo (1997) examined alexithymia before and after treatment in a group of inpatients diagnosed with panic disorder and social phobia. As compared to healthy controls, individuals with panic disorder and social phobia exhibited significantly higher rates of alexithymia. In addition, Fukunishi and colleagues (1997) found that alexithymia scores significantly decreased in both groups after treatment and that this reduction was not associated with depression. In a separate study, Fukunishi, Kikuchi, and Takubo (1997) found a significant decrease in alexithymia scores in an inpatient group receiving psychiatric treatment. The group was comprised of individuals diagnosed with panic disorder, obsessive-compulsive disorder, social phobia, generalized anxiety disorder, hypochondriasis, pain disorder, somatization disorder,

conversion disorder, sleep disorders, personality disorders, substance use disorders, and eating disorders.

Ability Emotional Intelligence

In an attempt to refine their original conceptualization of emotional intelligence, Mayer and Salovey (1997) suggested that emotional intelligence is comprised of four "branches." The first branch of ability emotional intelligence is termed Perceiving Emotions and refers to an individual's ability to perceive and identify emotions in oneself, others, and in other stimuli, including art, music, and stories (Brackett & Salovey, 2006; Mayer & Salovey, 1997; Mayer, Salovey, & Caruso, 2004). The second branch of ability emotional intelligence is referred to as Use of Emotion to Facilitate Thought and this is associated with the ability to use emotions in order to think rationally and logically. This conceptualization is based on previous research suggesting that emotions may facilitate creative thought (Isen, 1990; Isen & Daubman, 1984). The third branch of ability emotional intelligence proposed by Mayer and Salovey (1997) is called Understanding Emotions and it refers to the capacity of an individual to analyze emotions using language and thought. Individuals with a high feeling vocabulary have been found to be sensitive to the way in which emotion words are arranged and have demonstrated an ability to identify themes in emotional experiences (Lazarus, 1991; Ortony, 1990). The final branch in the ability emotional intelligence model is called Managing Emotion and refers to the ability to regulate moods and emotions in oneself and others. Specifically, this branch assesses an individual's ability to identify and discriminate among emotions, label their feelings appropriately, and assess and employ strategies that will successfully modify emotions in oneself or others.

In order to be considered a "true" intelligence, Mayer, Caruso, and Salovey (1999) suggested that emotional intelligence is best measured with ability or performance measures. Self-reports of ability and actual ability have been minimally correlated in other areas of intelligence research (Paulhus, Lysy, & Yik, 1998); thus, Mayer and colleagues (1999) suggested that the same would be true of emotional intelligence. In addition, Mayer and colleagues (1999) argue that measures like the Bar-On EQ-i have changed the fundamental conceptualization of emotional intelligence from a mental ability (e.g., ability to perceive emotion) to other self-reported qualities (e.g., optimism, well-being) that are conceptually different from established views of intelligence as ability.

Some studies have supported the view that ability emotional intelligence is similar to other cognitive conceptualizations of intelligence. Ability emotional intelligence, for example, as measured by the MSCEIT, has been significantly correlated with verbal intelligence and, to a lesser extent, with perceptual/organizational intelligence (Ciarrochi et al., 2000; Mayer et al., 1999). Other studies have suggested that ability emotional intelligence is not significantly associated with some personality variables and trait measures of emotional intelligence. Brackett and Mayer (2003), for example, found that in addition to being significantly correlated with verbal SAT scores, the MSCEIT was modestly correlated with openness and agreeableness, two personality factors that have been previously associated with other measures of intelligence (Brackett & Salovey, 2006). Brackett and Mayer (2003) also found that associations between MSCEIT and Bar-On EQ-i scores became nonsignificant after controlling for personality variables. Finally, a factor analysis produced one factor comprised of Bar-on EQ-i scores,

subjective well-being scores, neuroticism and conscientiousness and a second factor comprised of MSCEIT scores, verbal SAT scores, and agreeableness (Brackett and Mayer, 2003). These results suggest that ability emotional intelligence as measured by the MSCEIT can be differentiated from other forms (i.e., trait) of emotional intelligence, especially as measured by the Bar-On EQ-i. In addition to its associations with the Bar-On EQ-i, the MSCEIT has been examined in conjunction with the TMMS. Lopes, Salovey, and Straus (2003), for example, found that the TMMS-Clarity and TMMS-Attention subscales were not significantly correlated with scores on the MSCEIT. This same study replicated earlier findings by demonstrating that MSCEIT scores exhibited low correlations with personality characteristics, providing further evidence for an ability conceptualization of emotional intelligence. Other studies also have found that individuals with high scores on the MSCEIT require less cognitive effort to solve problems (Jauovec, Jauovec, & Gerli, 2001) and that MSCEIT scores are significantly positively associated with supervisor ratings of job performance even after controlling for cognitive intelligence (Zeidner, Matthews, & Roberts, 2004).

Trait Conceptualizations of Alexithymia and Emotional Intelligence

Trait Alexithymia

Although some research has supported the conceptualization of alexithymia as a secondary (i.e., state-dependent) construct, other work suggests that alexithymia is a stable personality trait and is a risk factor for a variety of psychopathologies. One major criticism directed against previous studies suggesting that alexithymia is a state-dependent construct (i.e., secondary) is their focus on absolute stability as opposed to relative stability. Absolute stability refers to the extent to which personality scores

change over time, whereas relative stability measures the extent to which relative differences among individuals remain the same over time (Luminet, Rokbani, Ogez, & Jadoulle, 2007). Research supporting the view of alexithymia as primary has sought to address the issue of relative stability.

In a study of patients with anorexia nervosa and bulimia nervosa undergoing psychiatric treatment, Schmidt, Jiwany, and Treasure (1993) found an improvement in symptomatology but did not find significant differences in alexithymia and depression scores before and after treatment. In addition, the authors found a significant correlation between alexithymia scores at baseline and at follow-up.

Other studies also obtained evidence for the relative stability of alexithymia. Luminet, Bagby, and Taylor (2001), for example, conducted a study examining alexithymia in a sample of individuals diagnosed with major depression in an outpatient clinic. The authors found a significant decrease in mean depression and alexithymia scores at follow-up, replicating previous findings regarding alexithymia's apparent lack of absolute stability. The authors, however, found support for alexithymia's relative stability. Specifically, baseline alexithymia scores were significantly correlated with follow-up alexithymia scores. In addition, baseline alexithymia scores significantly predicted follow-up alexithymia scores after controlling for depression scores. Finally, the change in depression scores accounted for only 3% of the variance in alexithymia change scores.

In a similar study, de Timary, Luts, Hers, and Luminet (2008) studied the absolute and relative stability of alexithymia in a sample of patients diagnosed with alcohol dependence undergoing alcohol withdrawal. Similar to the findings reported by Luminet,

Bagby, and Taylor (2001), de Timary and colleagues (2008) found that alexithymia scores were significantly correlated across three time points. The authors also found that baseline alexithymia scores significantly predicted alexithymia scores at Time 3 after controlling for depression and T2 alexithymia scores, in addition to finding that the change in depression scores accounted for only 1.6% of the variance in alexithymia change scores. Porcelli and colleagues (2003) had previously obtained similar results in a sample of patients with functional gastrointestinal disorders after a six-month follow-up.

In a large study examining alexithymia and symptoms of depression in a clinical sample, Saarijärvi, Salminen, and Toikka (2006) found that mean alexithymia and depression scores decreased significantly after a five-year follow-up. Consistent with other findings, the authors found that baseline alexithymia scores predicted follow-up alexithymia scores after controlling for depression. Similarly, significant decreases in mean alexithymia scores were observed in a sample of patients with obsessive-compulsive disorder (OCD) after a six-year follow-up (Rufer, Ziegler, Alsleben, Fricke, Ortmann, Brückner et al., 2006). Baseline alexithymia scores, however, significantly predicted alexithymia scores at the six-year follow-up. In a prospective study designed to measure alexithymia before the onset of emotional distress, Mikolajczak and Luminet (2006) assessed alexithymia and psychological distress in a sample of psychology undergraduate students at the beginning of the academic year and 12 weeks later during exams. Results of the study suggested that alexithymia exhibits relative stability, as baseline alexithymia scores were significantly correlated with alexithymia scores during the second time point. Although mean psychological distress scores increased during the exam period, no significant changes in mean alexithymia scores were observed. In

addition, baseline alexithymia scores predicted follow-up alexithymia scores over and above the variance explained by psychological distress, suggesting that the relative stability of alexithymia scores is not attributable to scores on psychological distress. A longitudinal study assessing undergraduate students after midterm exams and one week before final exams found significant changes in psychological distress but no significant changes in alexithymia scores (Martínez-Sánchez, Ato-García, Adam, Huedo Medina, & Selva España, 1998). A follow-up study also examining alexithymia and psychological distress assessed students at four time points before and after exams and found no significant differences in alexithymia scores (Martínez-Sánchez, Ato-García, & Ortiz-Soria, 2003). Another study assessing alexithymia in substance-dependent patients undergoing detoxification found that alexithymia scores were higher in these patients than in healthy controls and did not find significant changes in alexithymia scores after detoxification (Pinard, Negrete, Annable, & Audet, 1996). In another study of depressed patients, Saarijärvi, Salminen, and Toikka (2001) found no differences in alexithymia scores after a one-year follow-up. Salminen, Saarijärvi, Ääirelä, and Tamminen (1994) examined a group of hospital psychiatric outpatients and found significant decreases in psychological distress but no significant changes in alexithymia scores. There is evidence, then, to suggest that alexithymia is a stable characteristic, as evidenced by several longitudinal studies and their results.

Trait Emotional Intelligence

Given the plethora of research on emotional intelligence after Salovey and Mayer (1990) first proposed the concept, Mayer and Salovey (1997) expanded their original conceptualization of emotional intelligence as measured by the TMMS and suggested a

theoretically different construct, ability emotional intelligence (described above). Many researchers, however, refined the concept of emotional intelligence and suggested that emotional intelligence can also be conceptualized as a disposition, termed trait emotional intelligence. This kind of emotional intelligence relies on noncognitive constructs and is defined as being comprised of social, personality, and emotional skills associated with an individual's ability to cope effectively with environmental demands and pressures (Bar-On, Brown, Kirkcaldy, & Thomé, 2000). In addition, theorists suggested that trait emotional intelligence, unlike ability emotional intelligence, is best assessed via self-report questionnaires measuring behavior (Petrides & Furnham, 2000).

Research appears to support this conceptualization of emotional intelligence. Petrides and Furnham (2003), for example, administered the Bar-On EQ-i to a sample of psychology undergraduates, in addition to an emotion recognition task and two mood inductions (positive and negative). Results from the study showed that students high in trait emotional intelligence significantly recognized emotions better than students low in trait emotional intelligence. In addition, the researchers found that the students high in trait emotional intelligence were significantly more sensitive to mood inductions than students low in trait emotional intelligence. Studies have supported trait emotional intelligence's associations with other characteristics. Martinez-Pons (1997), for example, found that trait emotional intelligence was significantly associated with life satisfaction and adaptive goal orientation. Dawda and Hart (2000) found that high scores on the Bar-On EQ-i were significantly positively associated with positive affectivity and significantly negatively correlated with negative affectivity. In addition, the researchers found that individuals exhibiting high trait emotional intelligence exhibited significantly

less somatic symptomatology and less affective intensity as compared to individuals low on trait emotional intelligence. A factor location study by Petrides and Furnham (2001) found that Bar-On EQ-i scores emerged as a single factor in the context of extraversion and neuroticism, suggesting that the Bar-On EQ-i measures a distinct personality construct associated within established personality taxonomies.

Relationships to Psychopathology

Alexithymia

In addition to the research presented above, alexithymia generally has been associated with a variety of negative outcomes in several populations. One of the largest areas of alexithymia research is with individuals with somatoform disorders. Research with individuals diagnosed with somatoform disorders has shown that these individuals exhibit significantly greater alexithymia scores than healthy controls (Waller & Scheidt, 2004). It also has been suggested that alexithymia does not differentiate somatoform from depressive disorders (Duddu, Isaac, Chaturvedi, 2003). Longitudinal studies have confirmed the associations between alexithymia and somatoform disorders. Bach and Bach (1995), for example, found that alexithymia scores significantly predicted a somatoform disorder diagnosis, persistent somatization, and illness severity. In addition, alexithymia has been associated with difficulties in facial recognition in individuals diagnosed with somatoform disorders (Pedrosa Gil, Ridout, Kessler, Neuffer, Schoechlin, Traue, & Nickel, 2009). A study of somatization in a nationally representative sample of over 5,000 individuals in Finland found that alexithymia was associated with somatization after controlling for depression, anxiety, sociodemographic variables, and

presence of somatic illnesses (Mattila, Kronholm, Jula, Salminen, Koivisto, Mielonen, & Joukamaa, 2008).

Alexithymia also has been studied in relation to eating disorders. Cochrane and colleagues (1992), for example, found that an eating disorders group comprised of females diagnosed with anorexia nervosa, bulimia nervosa, and eating disorder not otherwise specified (EDNOS) exhibited higher levels of alexithymia than a psychiatric control group. DeGroot, Rodin, and Olmstead (1995) found that a sample of women diagnosed with bulimia nervosa scored significantly higher on the TAS-26 than a control sample of nurses without bulimia nervosa. Studies generally have replicated findings suggesting that both men and women diagnosed with eating disorders exhibit higher levels of alexithymia than healthy controls and psychiatric controls without eating disorders (Kessler, Schwarze, Filipic, Traue, & von Wietersheim, 2006; Taylor, Parker, Bagby, & Bourke, 1996). In addition, prospective studies have suggested that alexithymia is a predictor of syndromal and subsyndromal eating disorders and poorer treatment outcome (Speranza, Loas, Wallier, & Corcos, 2007). Finally, alexithymia has been associated with binge eating disorder, greater severity of binge eating disorder, higher body dissatisfaction, and lower self-esteem (Carano, De Berardis, Gambi, DiPaolo, Campanella, Pelusi, et al., 2006; Pinaquy, Chabrol, Simon, Louvet, & Barbe, 2003).

Emotional Clarity

As noted above, emotional clarity is characterized by awareness and understanding of one's own emotions and emotional experiences, as well as the ability to properly label them (Gohm & Clore, 2000). High levels of emotional clarity have been linked to adaptive coping and positive well-being (Gohm & Clore, 2000). Emotional

clarity also has been shown to protect against depressive symptoms caused by some, but not all, stressors, among older adults (Kennedy et al., 2010). In contrast, low emotional clarity predicts maladaptive interpersonal responses to stress and depressive symptoms in youth (Flynn & Rudolph, 2010; Flynn & Rudolph, 2014). In addition, students with high levels of emotional clarity show more adaptive problem-solving behavior with complex problems, and better performance on complex tasks than students low in emotional clarity (Otto & Lantermann, 2006).

As assessed by the DERS, lack of emotional clarity has been associated with a greater number of binge eating episodes (Whiteside, Chen, Neighbors, Hunter, Lo, & Larimer, 2007), chronic worry and symptoms of Generalized Anxiety Disorder (GAD) (Salters-Pedneault, Roemer, Tull, Rucker, & Mennin, 2006), and symptom severity in individuals with Post-Traumatic Stress Disorder (PTSD) (Ehring & Quack, 2010). Thus, it appears that low emotional clarity is associated with a variety of psychopathologies, including depression, eating disorders, and anxiety disorders.

Attention

Although the Attention subscale of the TMMS has not received as much research focus as the Clarity subscale, researchers have found interesting associations among attention to one's emotions, emotional clarity, and psychopathology. Gilboa-Schechtman and colleagues (2006), for example, found that a sample comprised of individuals diagnosed with anorexia nervosa and bulimia nervosa reported significantly lower levels of attention to emotion and emotional clarity, the latter finding being consistent with previous research. In a study of individuals diagnosed with GAD and social anxiety disorder, Turk and colleagues (2005) found that individuals diagnosed with social anxiety

reported paying less attention to their emotions than individuals diagnosed with GAD and healthy controls. Interestingly, no significant differences were observed between individuals with GAD and healthy controls on the TMMS-Attention subscale. Although low attention to emotions generally has been linked with negative outcomes and psychopathology, some research suggests that this finding may not be consistent with other outcomes. Specifically, greater attention to emotions has been associated with higher levels of magical thinking and peculiar beliefs (Berenbaum et al., 2006; Berenbaum, Boden, & Baker, 2009). In another study, Thompson and colleagues (2007) found that high attention to one's emotions, but low clarity, was significantly associated with somatic symptoms.

Emotional Awareness

Factor Analysis: Attention and Clarity

The above review of alexithymia and perceived emotional intelligence (specifically, the TMMS-Clarity and TMMS-Attention subscales) suggests that there are conceptual overlaps between these two constructs. Indeed, previous studies suggest that alexithymia and perceived emotional intelligence are comprised of two underlying dimensions: attention to one's emotions and clarity of one's emotions. Davies and colleagues (1998), for example, found that the TMMS-Clarity subscale was more strongly associated with the TAS-ID subscale than it was with the TAS-EOT subscale. Other studies found that the TMMS-Clarity, TAS-ID, and TAS-DES subscales grouped together in one cluster, and the TMMS-Attention and TAS-EOT subscales grouped together in another cluster (Coffey, Berenbaum, & Kerns, 2003; Gohm & Clore, 2000; Gohm & Clore, 2002). In addition to these factors, Gohm and Clore (2002) found that the

TAS-DES and the TMMS-Attention subscales significantly loaded on a separate factor (emotional expression).

Palmieri and colleagues (2009) noted that these analyses of the TAS and the TMMS are problematic because grouping these measures according to subscales does not measure the performance of individual items. Thus, potentially good items may be ignored because they are included in subscales with poor items. For these reasons, Palmieri and colleagues (2009) analyzed the subscales of the TAS and the TMMS using multidimensional scaling (MDS) and confirmatory factor analysis (CFA). MDS allows researchers to determine which individual items from each subscale group together and then these groupings can be confirmed using CFA. Emotional clarity was assessed by administering the TAS-ID and TMMS-Clarity subscales to a sample of college students. Attention to emotions was assessed by administering the TAS-EOT and the TMMS-Attention subscales. Together, attention and clarity comprise the construct of emotional awareness. Although the TAS-DES and the TAS-ID subscales have been found to be significantly correlated and to load on a mood identification factor in factor and cluster analyses of subscale scores, the TAS-DES subscale was not included in the analyses because the ability to communicate emotions is conceptually distinct from identifying emotions and from the overall construct of emotional awareness. Results of the MDS and CFA analyses using the TAS-ID, TMMS-Clarity, TAS-EOT, and TMS-Attention subscales indeed produced two factors: Attention and Clarity. The Attention subscale was comprised of 10 items (two from the TAS-EOT subscale and eight from the TMMS-Attention subscale) and the Clarity subscale was comprised of 13 items (five from the TAS-ID subscale and eight from the TMMS-Clarity subscale). The Attention and Clarity

scales showed high internal consistency ($\alpha = 0.87$ and 0.89, respectively) and were considered theoretically and psychometrically distinct from one another, as they correlated to a significantly lesser extent than did the clarity and attention scales formed from the relevant TAS and TMMS items and correlated to a significantly lesser extent than the Clarity and Attention subscales of the TMMS.

Emotional Clarity: Source and Type Awareness

An extension of this work examined potential additional factors in the concept of emotional awareness. Some studies have suggested that there are two facets of emotional clarity: source awareness and type awareness (Boden & Berenbaum, 2011; Baker, Thomas, Thomas, & Owens, 2007). Boden and Berenbaum (2011) suggested that existing subscales of emotional clarity (i.e., the TMMS-Clarity and TAS-ID subscales) refer to the understanding of the types of emotions experienced by an individual. The authors, however, suggested that there are no extant measures assessing the extent to which people know the causes of their emotions. Previous research has suggested that knowing the source of one's emotions affects judgments and attributions (Gasper & Clore, 2000; Kehner, Locke, & Aurain, 1993); thus, the authors proposed that understanding the source of one's emotions is a crucial aspect of emotional awareness. In order to distinguish between source and type awareness, Boden and Berenbaum (2011) administered the Clarity subscale developed by Palmieri and colleagues (2009), which is comprised of items from the TAS-ID and TMMS-Clarity subscales, and a measure of source awareness developed by the authors to a sample of college students. The measure of source awareness was comprised of eight items and included items such as, "When I am sad, angry, or scared, I usually know who caused it," and "I often have to think for a

while to figure out who made me sad, angry, or scared." Items pertaining to source and type awareness loaded on separate factors and each scale exhibited good internal consistency ($\alpha = 0.78$ and $\alpha = 0.89$ for source and type, respectively).

Discussion

The purpose of this paper was to trace the development of the current conceptualization of emotional awareness (comprised of attention to one's emotions and clarity, or an ability to identify and distinguish emotions) by presenting work relating to the two general constructs from which this concept derives: alexithymia and perceived emotional intelligence. From its inception, alexithymia was a clinically derived concept referring to individuals exhibiting a concrete thinking style, an inability to identify their emotions, an inability to communicate their emotions, and the absence of a fantasy life. The use of psychometrically poor instruments such as the BIQ and the SSPS led researchers to create the TAS-20, by far the most widely used assessment of alexithymia. Salovey and Mayer (1990) suggested that emotional intelligence, the ability to attend to, identify, and regulate one's emotions, was a subset of social intelligence and provided individuals with a variety of problem-solving skills. The development of the TMMS operationalized this construct by suggesting that it is comprised of three subscales (Attention, Clarity, and Repair), generating research examining the associations among Attention, Clarity, and a variety of outcomes. Debate exists, however, in both the alexithymia and emotional intelligence literatures in regards to whether these constructs are best conceptualized as personality traits or whether they are best conceptualized as a state or an ability.

The state approach to alexithymia suggests that alexithymia is secondary and that it is developed as a reaction against other psychopathologies and stressors. Although there is evidence to support this hypothesis, the trait approach to alexithymia more closely examines these trends and acknowledges that these studies tend to focus on absolute stability as opposed to relative stability. Longitudinal studies examining the relative stability of alexithymia have shown support for alexithymia as a stable trait.

The emotional intelligence literature also has a debate between ability and trait emotional intelligence, although this debate is, in some ways, more complex than the alexithymia debate. Researchers examining trait and state alexithymia generally agree on descriptions of the construct, its characteristics, and its measurement. In the emotional intelligence literature, however, researchers debate how this construct should be operationalized. The ability perspective argues that emotional intelligence should be related to other forms of intelligence and thus should be measured using performance measures, most notably the MSCEIT. The trait approach, however, states that emotional intelligence should also encompass social and personality skills associated with an individual's ability to cope effectively with environmental stressors and is assessed using a variety of self-report measures, including the TMMS and the Bar-On EQ-i. Although the ability and trait approaches to emotional intelligence are very different, an examination of subscales on both the MSCEIT and the Bar-On EQ-i both show that these approaches both assess the extent to which an individual can identify his/her emotional states; thus, it appears that despite the different ways of conceptualizing and measuring emotional intelligence, these two perspectives both suggest that identification of one's emotions is an important component of emotional intelligence.

When comparing alexithymia and (trait) emotional intelligence, it is clear that there is much conceptual overlap. Indeed, Palmieri and colleagues (2009) identified two factors common to both constructs that comprise the overall construct of emotional awareness: Attention and Clarity. It should be noted, however, that these factor analyses conducted by Palmieri and colleagues (2009) are based on self-report measures. In addition to identifying Attention and Clarity as facets of emotional awareness, recent studies have suggested that emotional clarity can be divided further into two forms: source awareness and type awareness. This new literature has been useful in elucidating the differences between these two types of emotional clarity and their relationships to different clinical phenomena (e.g., schizotypy).

Although the literature on emotional awareness has steadily progressed over time, there are still several areas in need of more research. One area for future study includes using longitudinal designs to examine emotional awareness. To date, all studies using the recent conceptualization of emotional awareness are cross-sectional in nature. Another area of growth in the emotional awareness literature involves using behavioral measures to assess attention and clarity. Studies examining emotional awareness have used only self-report measures and have not assessed attention, source awareness, and type awareness using behavioral measures. This is important because of the need to increase convergent validity in the measures employed in a research study and in order to assess whether components appear to be more trait-related, state-related, or ability-related, especially if behavioral measures are used with longitudinal designs. Finally, future work should emphasize the distinction between source and type emotional clarity and their relation to other psychopathologies (e.g., anxiety disorders, depression). Many recently

published studies using the ECQ and other measures of emotional clarity do not distinguish between source awareness and type awareness and thus do not provide a nuanced perspective on the role of emotional clarity in a variety of outcomes. This also calls into question the frequent practice of examining emotional clarity as its own variable independent from attention (and thus not examining emotional awareness as a whole). In order to make true, meaningful progress in the field, it is important for research to be theoretically sound by identifying and clarifying these subtleties.

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