ASSESSING SCHIZOID ASOCIALITY IN SCHIZOPHRENIA:
DETERMINING THE CONSTRUCT VALIDITY OF TWO SELF-REPORT SCALES.

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Summary

The Revised Social Anhedonia Scale (RSAS) was developed to measure “schizoid asociality,” defined as a trait-like lower capacity for enjoyment of social interaction. Scores on the RSAS, however, are often associated with factors that suggest that an individual may experience social interaction as aversive rather than simply unrewarding. The Social Withdrawal Motivation Scale (SWiMS) was developed to more accurately determine motivation for social withdrawal, and includes subscales measuring suspiciousness, hostility, social anxiety, and schizoid asociality. The present study compares the discriminant and convergent validity of the RSAS and SWiMS in a sample of 33 outpatients with schizophrenia or schizoaffective disorder. Higher scores on the RSAS were related to higher levels of suspiciousness, hostility, anxiety, and depression; higher scores on SWiMS schizoid asociality (SWiMS-SZA) were only related to higher interviewer-rated depression. This demonstrates superior discriminant validity of the SWiMS-SZA subscale compared to the RSAS. Higher SWiMS-SZA scores, however, were not related to measures of high apathetic social withdrawal, low approach motivation, or low positive affect; higher SWiMS-SZA scores were also associated with non-deficit schizophrenia. The SWiMS, therefore, may not demonstrate adequate convergent validity. Exploratory analyses examine ways to improve the validity of these scales.


**Introduction**

Human beings are generally considered to be social animals, with a fundamental motivation to form interpersonal relationships (Baumeister & Leary, 1995). Forming and maintaining social support systems has been consistently linked to improved physical and mental health (Moak & Agrawal, 2010; Uchino, 2009). However, there are individual differences in social motivation that may be due to differences in reinforcement. Individuals might experience social interaction as providing little reward, experience solitude as particularly rewarding, or experience social interaction as particularly aversive (Leary, Herbst, & McCrary, 2003).

Social anhedonia is a reduced enjoyment of social interactions and can be a symptom of some psychiatric disorders, such as major depression and schizophrenia. It is generally considered to refer to experiencing social interaction as providing little reward. In schizophrenia, it is often considered to be a stable feature of individuals with schizophrenia, rather than an episodic symptom as in major depression. In other words, individuals with schizophrenia are theorized to have a lower capacity for social enjoyment, rather than a temporary experience of less social enjoyment due to transient symptoms of a psychiatric disorder (as in depression) (Carpenter, Heinrichs, & Wagman, 1988). Throughout this manuscript, this trait-like lower capacity for social enjoyment will be referred to as “schizoid asociality” to distinguish it from episodic, transient lower social enjoyment.
Elevated scores on the Revised Social Anhedonia Scale (RSAS; Eckblad, Chapman, Chapman, & Mishlove, 1982), a self-report instrument designed to measure schizoid asociality, are associated with later development of schizophrenia in young, psychologically healthy individuals (Chapman, Chapman, Kwapiel, Eckblad, & Zinser, 1994; Kwapiel, Miller, Zinser, Chapman, & Chapman, 1997). In addition, elevated scores on the RSAS are associated with schizoid asociality in individuals with schizophrenia (W. Horan, 2003), along with reduced social and global functioning (Cohen et al., 2005; Strauss, Harrow, Grossman, & Rosen, 2010).

The RSAS, however, is also associated with factors that suggest an experience of social interaction as aversive, rather than simply not rewarding, as in schizoid asociality (e.g. Blanchard, Horan, & Brown, 2001). Since the RSAS is one of the most frequently used measures of schizoid asociality, and is a correlate of a number of factors of great importance to understanding schizophrenia, measures of schizoid asociality with improved validity could improve the quality of this research. The following study aims to assess the construct and discriminant validity of the RSAS, as well as that of a self-report measure developed by the researcher.

**Development of the Revised Social Anhedonia Scale**

The RSAS was designed to assess a component of schizotypy. Schizotypy is conceptualized as a personality organization; according to Meehl (1962), this personality organization includes certain cognitive, emotional, and behavioral features, which
individuals at genetic risk for schizophrenia (whom Meehl referred to as “schizotaxic”) develop when exposed to existing social learning schedules. Meehl suggested that the main features of schizotypy are cognitive slippage, interpersonal aversiveness, anhedonia, and ambivalence. He considered this anhedonia to be mainly interpersonal in nature, and his further description of anhedonia corresponds to the definition of schizoid asociality (Meehl, 1964).

Meehl (1962) specified that most, if not all, at genetic risk for schizophrenia would develop this personality organization, due to a wide variety of existing social learning schedules. He also specified that, due to heterogeneity in at-risk individuals’ environments, there is a continuum of functional severity in these individuals, ranging from those who are relatively healthy to those who eventually develop schizophrenia (Meehl, 1962). Although some schizotypal individuals function relatively well, a person with elevated schizotypy theoretically is more likely to be carrying genes associated with schizophrenia than a person with low schizotypy. The current understanding of genetic liabilities for schizophrenia is that there is not a single major schizotaxic gene, and that schizophrenia is likely to have a polygenic diathesis; thus, vulnerability varies among relatives of individuals with schizophrenia (Walters, O’Donovan, & Owen, 2011).

The Wisconsin Schizotypy Scales, which include the RSAS, were developed to measure several different components of schizotypy. The content of the scales was based largely on Meehl’s description of schizotypy and Hoch and Cattel’s description of a similar concept referred to as “pseudoneurotic schizophrenia.” The resulting measures included the Magical Ideation, Perceptual Aberration, Impulsive Nonconformity,
Physical Anhedonia, and Social Anhedonia scales. The items on the original anhedonia scales were based on a definition of anhedonia as “a life-long characterological defect in the ability to experience pleasure” (p.376, Chapman, Chapman, & Raulin, 1976). For the Social Anhedonia Scale, the items were based on a defect in the ability to experience interpersonal pleasure, which included such activities as talking, engaging in activities, and exchanging emotional expressions with other people. Attempts were also made to eliminate effects of depression and social desirability when generating items for the Social Anhedonia Scale (Chapman, Chapman, & Raulin, 1976).

Meehl’s description of schizotypal individuals specified that, in social interactions, they experienced both low positive affect (lack of pleasure) and high negative affect (elevated anxiety). As a result, the original Social Anhedonia Scale included items that reflected both schizoid asociality and social anxiety. High scores on this scale were not related to psychotic-like symptoms in healthy individuals. The authors hypothesized that this might have been due to the inclusion of social anxiety items and referenced previous longitudinal data suggesting that socially anxious children were not at higher-than-average risk for developing schizophrenia later in life. Therefore, the authors revised the Social Anhedonia Scale to attempt to eliminate items that could reflect social anxiety rather than schizoid asociality, resulting in the development of the RSAS (Mishlove & Chapman, 1985).

The RSAS, along with the other Wisconsin Schizotypy scales, was included in ten-year longitudinal studies to determine whether elevated scores on the scale would be associated with greater severity of concurrent psychotic-like experiences. In addition, the
authors hypothesized that individuals with elevated scores would have higher rates of clinical psychosis at the follow-up assessment than individuals with lower scores. Individuals with elevated scores on both the RSAS and the Magical Ideation Scale were particularly likely to later develop clinical psychosis (Chapman et al., 1994; Kwapil et al., 1997). Further studies suggested that the RSAS identified individuals specifically at risk for schizophrenia-spectrum disorders, whereas the Magical Ideation scale alone was also associated with risk for mood disorders and substance use disorders (Kwapil, 1998).

In addition to this evidence of predictive validity, healthy individuals with elevated scores on the RSAS appear to have neurocognitive, perceptual, and physiological characteristics that are similar to those in individuals with schizophrenia. Healthy individuals who are relatives of individuals with schizophrenia also tend to produce elevated scores on the RSAS (Horan, Brown, & Blanchard, 2007).

**Validity of the Revised Social Anhedonia Scale**

Despite the revision of the RSAS and the evidence of predictive validity, there appear to be problems with other types of validity. Specifically, the discriminant validity of the RSAS might be lower than is often assumed. There is evidence that the RSAS inadequately distinguishes between passive social withdrawal and active social withdrawal (Bailey, West, Widiger, & Freiman, 1993; Bell et al., n.d.; Blanchard, Mueser, & Bellack, 1998; Widiger, Freiman, & Bailey, 1990). Passive social withdrawal is analogous to schizoid asociality, in that it involves a lack of motivation to approach social interaction because the individual does not experience these interactions as
particularly rewarding, which would involve decreased positive affect. In contrast, active social withdrawal involves a motivation to avoid social interaction because the individual experiences these interactions as particularly aversive, which would involve increased negative affect. This distinction is particularly important because, if the RSAS is largely measuring active social withdrawal rather than schizoid asociality, this could significantly affect interpretations of the results of previous and future studies.

**Results of factor analyses**

Factor analyses of schizotypy scales that include the RSAS have found that the RSAS loads on both positive and negative schizotypy factors, which correspond to positive and negative symptoms of schizophrenia (Fonseca-Pedrero, Paino, Lemos-Giráldez, Sierra-Baigrie, & Muñiz, 2010; Kwapił, Barrantes-Vidal, & Silvia, 2008; Lewandowski et al., 2006a). If the RSAS is measuring schizoid asociality, the fact that it would load on a positive schizotypy factor could be problematic. The consistent, though initially unanticipated finding that the RSAS loads on both positive and negative schizotypy factors has been explained as potential evidence that social anhedonia, as measured by the RSAS, is indeed a core feature of schizotypy (as Meehl [1962] originally proposed), because it reflects the fundamentally multidimensional nature of schizotypy (Kwapil et al., 2008; Lewandowski et al., 2006a). Of the other four Wisconsin Schizotypy scales, the Magical Ideation and Perceptual Aberration scales are associated only with positive symptoms in psychosis-prone individuals, and the Physical Anhedonia scale is associated with negative symptoms (Kwapil, Crump, & Pickup, 2002).
An association of the RSAS with both positive and negative symptoms is notable because the items do not appear to tap any positive symptoms. However, it should be noted that none of the Wisconsin Schizotypy scales specifically assess paranoia or suspiciousness. The RSAS may tap into these types of experiences in a way that the Perceptual Aberration and Magical Ideation scales do not. The Perceptual Aberration scale was written primarily to assess distortions in the perception of one’s body (e.g. perceptions of change in the proportions of the body, or spatial relationships of body parts) (Chapman, Chapman, & Raulin, 1978). The Magical Ideation scale would be the most likely to relate to delusions, which are a core symptom of schizophrenia. The items focus largely on attenuated experiences of referential delusions, passivity experiences, grandiose delusions, and spiritual delusions. In schizophrenia, the most commonly experienced delusions are persecutory in nature; for example, beliefs that one is being spied on, plotted against, or ridiculed by others (American Psychological Association, 2000). Although the Wisconsin Schizotypy scales do not assess these types of experiences explicitly, the RSAS may be assessing them unintentionally.

Item-level factor analysis of the RSAS has found evidence of four factors. These factors have been interpreted as “lack of importance of close friends,” “lack of emotional attachment,” “lack of involvement with others,” and “preference for being alone” (Blanchard, Gangestad, Brown, & Horan, 2000) If these interpretations are accurate, the latter two factors are particularly ambiguous. “Lack of involvement with others” and “preference for being alone” involve a behavioral element, unlike “lack of importance of close friends” and “lack of emotional attachment,” which mainly reflect psychological
experiences. Less engagement in social behavior might indeed be due to apathetic social withdrawal, driven by schizoid asociality. Less social engagement could, however, be due to active social withdrawal, caused by negative beliefs about social behavior, such as suspiciousness, anxiety, or hostility.

**Personality and personality disorders**

Previous studies have suggested that the RSAS does not appear to be measuring schizoid asociality. Scores on the RSAS do not seem to be uniquely related to schizophrenia-spectrum disorders, and studies suggest that high RSAS scores could reflect a non-pathological personality variable or could be attributed to a general social maladjustment factor (Merritt, Balogh, & DeVinney, 1993), with decreased well-being and a general tendency to experience negative affect. In addition, despite its revision to remove the effects of social anxiety, the RSAS remains associated with interaction anxiousness and fear of negative evaluation (Blanchard, Mueser, & Bellack, 1998).

High RSAS scores are associated with behaviors once considered prototypical of schizoid personality disorder (i.e. not speaking unless spoken to, avoiding social situations, declining the opportunity to socialize, and little eye contact) (Widiger et al., 1990). None of these “prototypical behaviors,” however, were actually found to be associated with schizoid personality disorder. Instead, these behaviors were significantly associated with diagnoses of schizotypal, avoidant, and passive-aggressive personality disorders. These disorders involve active social avoidance due to suspiciousness, anxiety, and hostility, rather than the schizoid asociality purportedly measured by the RSAS.
The substantial correlation of the RSAS with avoidant personality disorder has been replicated, although it was found that this was potentially due to the effects of state anxiety and depression. Nonetheless, substantial contamination of the RSAS items with social anxiety is problematic if the RSAS purports to measure schizoid asociality. This suggests that the effort to remove social anxiety items in the revision of the Social Anhedonia Scale might not have been successful (Bailey, West, Widiger, & Freiman, 1993).

**Anxiety and depression**

The daily social life of individuals with elevated RSAS scores appears to be qualitatively different from individuals with high social anxiety (Brown, Silvia, Myin-Germeys, & Kwapis, 2007; Kwapis et al., 2009). Experience sampling found that individuals with high social anxiety experienced low positive affect, high negative affect, and indicated that they would prefer to be alone when engaged in social interactions with people whom they did not know well; however, when they felt closer to their interaction partners, these individuals experienced less negative affect and less preference for being alone. In contrast, individuals with elevated RSAS scores experienced low positive affect and a more generalized preference for being alone. They were also more likely to actually be alone at any given moment, to be alone by choice, and to enjoy being alone. Finally, individuals with elevated RSAS scores did not indicate that they were alone because they believed others were not interested in spending time with them (Brown, Silvia, Myin-Germeys, & Kwapis, 2007; Kwapis et al., 2009).
The basic motivations of individuals with high social anxiety and schizoid asociality could be conceptualized in an approach-avoidance framework. Schizoid asociality could be characterized simply as low approach motivation. In contrast, social anxiety could be characterized by an approach-avoid conflict. In individuals with high social anxiety, the desire for social interaction, and therefore the approach motivation, is intact; however, social interactions are experienced as aversive in a way that increases avoidance motivation (Silvia & Kwapil, 2011). The fact that socially anxious individuals are extremely concerned about being accepted by others and particularly afraid of rejection and criticism highlights their fundamental motivation to belong to a social group, unlike schizoid asocial individuals who are simply uninterested in social acceptance.

Again, the focus on this contrast between socially anxious and schizoid asocial individuals neglects other reasons for social withdrawal behavior and lower desire for social interaction. Besides low approach motivation and approach-avoidance conflict, lowered desire for social interaction could be mainly due to high avoidance motivation. Suspiciousness and hostility are potential manifestations of high social avoidance motivation. It could be expected that individuals experiencing elevated suspiciousness and hostility would report affective and behavioral experiences similar to the group with elevated RSAS scores, including enjoying solitude and more frequently spending time alone by choice. These behaviors do not necessarily imply that an individual is uninterested in spending time with other people. Rather, they may imply that the
individual is interested in spending time away from other people, whom he or she perceives as hostile, untrustworthy, or irritating.

A longitudinal study of schizophrenia patients and depression patients found that elevated RSAS scores were associated with high negative affect and low positive affect for both groups at the baseline assessment (Blanchard et al., 2001). RSAS scores remained stable at follow-up in the schizophrenia group, but declined in the depression group; however, in both groups, affective and thought disturbance symptoms improved. This would suggest that affective and thought disturbance symptoms are not substantially contributing to RSAS scores in patients with schizophrenia. The specific symptoms comprising the thought disturbance and affect factors, however, include suspiciousness in the thought disturbance factor and hostility in the affective factor. These are examples of interpersonal attitudes that may lead to active social withdrawal, rather than apathetic social withdrawal. Unfortunately, temporal stability analyses of these potentially important symptoms were not reported (Blanchard et al., 2001).

Finally, the RSAS has been found to be associated with self-reported depression (Blanchard et al., 2001; Lewandowski et al., 2006a). Anhedonia is a symptom of depressive disorders; however, in contrast to the schizoid asociality purportedly measured by the RSAS, anhedonia in depression is episodic, rather than a stable characteristic (American Psychological Association, 2000). The wording of the items on the RSAS might be ambiguous in a way that leads individuals to interpret them as referring to their present experience rather than their general traits.
Schizoid Asociality, Negative Symptoms, and Deficit Syndrome in Schizophrenia

The RSAS appears to be a flawed measure of schizoid asociality, as it often is associated with the presence of various forms of active social avoidance while purporting to measure apathetic social avoidance. This problem parallels the theory of deficit schizophrenia (Carpenter et al., 1988), which was developed to resolve a frequent difficulty in distinguishing the underlying causes of overt negative symptoms in schizophrenia. The term “negative symptoms” originated in the neurology literature and refers to a loss of normal functioning resulting from a particular disease process. This terminology was introduced into the schizophrenia literature to describe symptoms such as affective flattening, avolition, and alogia. However, symptoms that apparently reflect a loss of normal functioning, and thus appear to be “negative,” may actually be “positive,” caused by the presence of abnormal functioning.

In the theory of deficit schizophrenia, this distinction is made by classifying any apparent negative symptoms as either primary or secondary. Primary negative symptoms, or “deficit symptoms,” are present as enduring traits and are considered idiopathic to the schizophrenia disease process. Secondary negative symptoms could appear similar, on the surface, but they are determined to be caused by factors secondary to the disease process, such as medication side effects, depression, anxiety, or psychotic symptoms (e.g. paranoid social withdrawal) (Carpenter et al., 1988; Kirkpatrick, Buchanan, Ross, & Carpenter, 2001). For example, social withdrawal is a behavior that could reflect a primary negative symptom, an enduring loss of normal functioning (i.e. the person is not motivated toward social interaction, due to low positive affect). However, it could also be
caused by secondary factors, such as anxiety (i.e. the person is motivated to avoid social interaction due to exaggerated fear of rejection). Essentially, the RSAS appears to be ineffective at classifying social withdrawal as a primary or secondary negative symptom.

The Need For a Valid Scale of Schizoid Asociality

Although the RSAS has demonstrated some utility in identifying psychosis-prone individuals, it has not adequately demonstrated that it is a valid measure of schizoid asociality. Instead, findings suggest that it might be measuring a form of active social withdrawal - social withdrawal due to negative experiences with, or attitudes toward, other people. The present study will approach this problem by developing a new self-report measure of social withdrawal and comparing its validity with the RSAS.

To improve upon the validity of the RSAS, it is clear that a targeted measure of different motivations for social withdrawal is needed. The inability to distinguish passive social withdrawal from active social withdrawal appears to be the main problem with the RSAS. However, one must keep in mind the fact that the RSAS does, indeed, effectively identify psychosis-prone individuals, and is thus measuring a social withdrawal-related construct that is a risk factor for schizophrenia. It is important to attempt to clarify the motivational component of this social withdrawal construct in order to 1) more effectively identify psychosis-prone individuals, 2) determine whether schizoid asociality is actually a characteristic of psychosis-proneness, 3) learn more about the nature of schizoid asociality (e.g. more accurately determine associated features), 4) better evaluate functioning, treatment, and recovery in schizophrenia.
A scale with improved validity could help more effectively identify individuals considered to be schizotypal and therefore, at risk for the later development of schizophrenia. If the RSAS items are tapping more than one type of social withdrawal motivation, an improved scale or scales could separately measure the different constructs tapped by the RSAS so that the specific construct(s) potentially predicting schizophrenia could be tested by repeating previous studies with the RSAS and the new scale. For example, the longitudinal studies of the Wisconsin Schizotypy scales’ predictive and concurrent validity could be repeated with both the Wisconsin Schizotypy scales and the new social withdrawal motivation scale, in order to compare their predictive and concurrent validity. If a scale measuring suspiciousness, for example, predicted the later development of schizophrenia more effectively than the RSAS and/or a more valid schizoid asociality scale, then suspiciousness would be identified as a more important characteristic of at-risk individuals. In fact, it is possible that schizoid asociality may not truly be a characteristic of at-risk individuals, and a new scale may help clarify this.

Even if schizoid asociality were not particularly characteristic of at-risk individuals, it is characteristic of a subset of individuals with schizophrenia. As mentioned previously, findings have suggested the existence of a substantial minority of individuals with schizophrenia who manifest a deficit syndrome as a component of schizophrenia. The deficit syndrome, as compared to non-deficit schizophrenia, seems to be associated with different symptom presentation, etiology, and biological factors, and poorer general functioning, prognosis, and treatment response (Kirkpatrick et al., 2001). Symptoms of the deficit syndrome include schizoid asociality that is trait-like – it is not
associated with other factors such as depression, anxiety, paranoia, or medication effects, and it endures despite fluctuations in other symptoms. This can contribute to poorer functioning and prognosis and is thus quite important clinically. Diagnosis of the deficit syndrome, however, involves special training in a clinical interview (Kirkpatrick et al., 2001). Although this is the gold standard, it may not always be feasible for clinicians to conduct such an interview. A valid self-report measure might be useful in assessing schizoid asociality in patients. In addition to contributing to a poor prognosis, deficit symptoms are particularly resistant to treatment. Studies that seek to develop treatments for such symptoms might benefit from a valid measure of schizoid asociality to determine the effectiveness of a treatment that targets this characteristic.

**Considerations for Developing and Validating a New Scale**

The aim of this study was to develop a new scale to measure social withdrawal motivations including schizoid asociality, the Social Withdrawal Motivation Scale (SWiMS; refer to Table 1 for a list of acronyms for the measures used in this study), and to compare different indices of its validity with the RSAS in a sample of patients with schizophrenia. A preliminary version of the SWiMS was developed, and pilot studies were conducted with an undergraduate sample. After data collection on several initial versions of the SWiMS, principle components analysis confirmed the presence of four internally-consistent factors that were interpreted as schizoid asociality, suspiciousness, hostility, and social anxiety. In the undergraduate sample, high scores on the suspiciousness, hostility, and social anxiety subscales were related to high scores on other
measures of their respective constructs; the schizoid asociality subscale was unrelated to other measures of suspiciousness, hostility, and social anxiety (Schumann, Moe, Hiebing, & Docherty, 2010).

Several considerations were addressed when developing the SWiMS. First, it was decided that this new scale should measure several different possible social withdrawal motivations using the same response format and instructions. Besides schizoid asociality, other motivations of interest are social anxiety, suspiciousness, and hostility. Social anxiety was included because it was originally considered to be a component of schizotypy (Meehl, 1962), and has been found to be characteristic of schizotypal individuals (Brown, Silvia, Myin-Germeys, Lewandowski, & Kwapił, 2008). Although the authors of the RSAS attempted to remove social anxiety items, the RSAS still seems to measure social anxiety to some extent (Lewandowski et al., 2006b). In addition, in previous studies of undergraduate students and patients with schizophrenia, scores on the RSAS have been associated with interview and self-report measures of suspiciousness and hostility (Bell et al., n.d.).

The items on the SWiMS were also carefully constructed to improve sensitivity. Low sensitivity of many items may be the reason that the RSAS does not clearly distinguish between schizoid asociality, social anxiety, hostility and suspiciousness. For example, RSAS items such as “People sometimes think that I am shy when I really want to be left alone,” “People are usually better off if they stay aloof from emotional involvements with most others,” and “I prefer hobbies and leisure activities that do not involve other people” are relatively ambiguous. These desires, beliefs, and behaviors may
be due to motivations to avoid others or not approach others, or a conflict between motivations to approach and to avoid others. Improved item clarity could increase the probability the responders would understand that the items are asking whether they respond to other people with feelings of anxiety, suspiciousness, hostility, or apathy. Finally, the items were constructed so that they would reflect trait-like characteristics rather than temporary states. Schizotypy is considered to be a personality organization that identifies individuals at risk for schizophrenia because the characteristic personality organization is stable, enduring, and present prior to the onset of clinical psychosis (Meehl, 1962). Thus, if the SWiMS is intended to be useful in identifying at-risk individuals prior to the onset of schizophrenia, it should identify individuals with potentially relevant traits.

In the current study, the validity of the RSAS and the SWiMS was established using other self-report scales, clinical interviews, and a neurobiological endophenotype. The current study included assessments of depression, state anxiety, social anxiety, suspiciousness, hostility, and schizoid asociality to assess the convergent and discriminant validity of the RSAS and the SWiMS in people with schizophrenia. Individual differences in basic, trait-like motivational drives were also assessed. As schizoid asociality, social anxiety, suspiciousness, and hostility all involve certain patterns of approach and avoidance, it is important to assess the extent to which a person is generally motivated to approach reward and to avoid punishment. These general tendencies may be reflected in social motivation patterns. Deficit versus non-deficit status was also assessed, as the types of symptoms in the deficit syndrome have been found to
have two factors: avolition and poor emotional expression, which includes diminished emotional range (Kimhy, Yale, Goetz, Mcfarr, & Malaspina, 2006; Nakaya & Ohmori, 2008). Although these are two separate factors, motivation and emotion are theoretically associated with each other, and physiological neural systems underlying motivation are linked with those related to physiological arousal and hedonic valence, which help to guide behavior (Bradley, 2000). Thus, assessing both major types of deficit symptoms was intended to help identify how the RSAS and SWiMS are related to trait-like emotional range and motivation, including social motivation drive, which is included in the avolition factor.

Another marker of social motivational drive appears to be olfactory processing ability (Malaspina & Coleman, 2003). In most mammals, olfactory processing is related to social affiliation and the brain circuitry involved in social affiliation, emotion, and general motivation, significantly overlaps with that involved in olfactory processing, particularly in the orbitofrontal cortex, amygdala, and olfactory epithelium (Malaspina et al., 2002). Deficits in smell identification are consistently associated with the deficit syndrome in schizophrenia (Cohen et al., 2007). Diminished social motivation is particularly related to smell identification deficits. It is telling that these deficits are not associated with positive symptoms (including suspiciousness and hostility), or general symptoms (including anxiety and depression). Although associated with state-related negative symptoms of schizophrenia, this was primarily accounted for by trait-like, enduring diminished social motivation (Malaspina & Coleman, 2003). Smell identification could be used to assess the convergent validity of both the RSAS and the
SWiMS measures of schizoid asociality, because it is related to low social approach motivation rather than high social avoidance motivation.

**Summary**

Schizoid asociality has been proposed to characterize people with schizophrenia, and to be a trait that could identify individuals who are at risk for the development of schizophrenia. Elevated scores on the most widely-used measure of schizoid asociality, the Revised Social Anhedonia Scale, have been shown to predict the later development of schizophrenia in healthy individuals. However, despite the evidence of predictive validity, there is also evidence that the RSAS does not measure schizoid asociality, but might instead be measuring an active form of social withdrawal. There is a need to further examine the validity of the RSAS. In addition, a new scale has been developed to measure schizoid asociality within the context of general social withdrawal, and its validity will be examined and compared with that of the RSAS.

**Hypotheses**

1. In people with schizophrenia, higher scores on the RSAS will be related to:
   a. Elevated active social withdrawal, social anxiety, suspiciousness, and hostility,
   b. Elevated trait negative affect, current anxiety, and current depression,
   c. Elevated general avoidance motivation,
   d. Categorization in the non-deficit schizophrenia group
2. SWiMS schizoid asociality scores will not be related to the aforementioned variables, and higher scores on the RSAS will be significantly more highly related to the aforementioned variables than higher scores on the SWiMS schizoid asociality subscale.

3. Higher scores on the SWiMS schizoid asociality subscale will be related to:
   a. More elevated passive social withdrawal,
   b. Lower general approach motivation,
   c. Lower trait positive affect,
   d. Lower consummatory pleasure
   e. Greater smell identification deficit,
   f. Categorization in the deficit schizophrenia group.

4. Scores on the SWiMS schizoid asociality subscale will be significantly more highly related to the aforementioned variables than scores on the RSAS.

5. Higher scores on the SWiMS suspiciousness, social anxiety, and hostility subscales will be related to:
   a. More elevated self-report and interview rated measures of their respective constructs,
   b. Higher general avoidance motivation,
   c. More elevated trait negative affect.
   d. Categorization in the non-deficit schizophrenia group.
Method

Participants

Participants were recruited from those participating in a larger NIH grant-funded study of schizophrenia, language, and cognition (Grant number R01 MH058683). Participants were 33 outpatients with a diagnosis of schizophrenia or schizoaffective disorder who were receiving treatment at an urban community mental health center. The participants were referred by either their therapists or case managers, recruited via postings in the mental health center, or were informed about the study via word-of-mouth. Exclusion criteria were a) participant age outside the range of 18-51 years, b) substance abuse or dependence occurring within a 12-month period prior to their participation in the study, and c) indications of possible organic brain damage (e.g. head injury resulting in unconsciousness, severe past alcohol or drug dependence requiring detoxification treatment, mental retardation, or seizure disorder). Demographic data are presented in Table 2. The majority of the participants were unemployed or receiving disability benefits. All of the participants were being treated with antipsychotic medications.
Measures

Diagnoses were determined during a previous session by a clinical psychologist with extensive research diagnostic experience based on information obtained by doctoral students using the Schedule for Affective Disorders and Schizophrenia – Lifetime Version (Endicott & Spitzer, 1978) and from clinic records. The interview was adapted slightly so that diagnoses could be determined according to DSM-IV criteria. Individuals who met diagnostic criteria for schizophrenia or schizoaffective disorder in the previous study were recruited for this follow-up session.

Symptom ratings

Psychiatric symptomatology. Current symptoms of psychopathology were assessed using the Positive and Negative Syndrome Scale (PANSS) (Kay, Fiszbein, & Opler, 1987), by which thirty symptoms of schizophrenia are rated based on information gathered from an interview. The PANSS interviews were video recorded. The interview assessed symptoms of psychopathology occurring during the seven days prior to the interview. The interview assessed frequency and severity of a total of thirty positive, negative, and general psychopathology symptoms. Symptoms of interest included suspiciousness/persecution, hostility, emotional withdrawal, passive/apathetic social withdrawal, depression, anxiety, and active social avoidance. Trained graduate level researchers rated each symptom on a scale of one to seven using standardized definitions and anchor criteria for each of the thirty symptoms. PANSS inter-rater reliabilities were assessed by means of intraclass correlations computed on a subset of ten co-rated
participants. Intraclass correlations for the seven symptoms of interest ranged from 0.711 (active social avoidance) to 0.985 (anxiety).

**Deficit syndrome.** Symptoms of the deficit syndrome of schizophrenia were measured using the Schedule for the Deficit Syndrome (SDS; Kirkpatrick, Buchanan, Alphs, McKinney, & Carpenter, 2010). The SDS is a semi-structured interview designed to measure six symptoms of the deficit syndrome: restricted affect, diminished emotional range, poverty of speech, curbing of interests, diminished sense of purpose, and diminished social drive. Each symptom was rated on a 0-4 scale, with higher scores indicating greater severity of the symptom. The raters attended a workshop offered by the authors of the SDS to learn administration and scoring procedures and achieve reliability with the authors of the SDS.

If the score on a particular symptom was 2 or higher, the rater further specified whether the symptom was primary and enduring. For a symptom to be considered primary, it must not be attributable to factors such as dysphoric affect, suspiciousness, demoralization, medication effects, and mental retardation. The side effects of antipsychotic medications can mimic primary negative symptoms (Moritz, Andreou, Klingberg, Thoering, & Peters, 2013). Although this possibility could not be avoided in this sample of participants, an effort was made to take medication effects into account when conducting and rating the interviews. For a symptom to be considered enduring, it must be present during the past 12 months, particularly during periods of relative clinical stability. If the patient met diagnostic criteria for schizophrenia, two or more of the six deficit symptoms were rated a 2 or greater in severity, and these symptoms are primary
and enduring, the patient met criteria for deficit schizophrenia. In this sample, 8 patients met criteria for deficit schizophrenia and 21 patients met criteria for non-deficit schizophrenia. Four patients discontinued the study prior to completion of the SDS interview.

**Depression.** The Beck Depression Inventory – II (BDI-II; Beck, Steer, & Brown, 1996) was used to assess current depression. It is a 21-item self-report questionnaire with instructions for the responder to choose the appropriate statement in each item to describe their experiences over the past two weeks, including the day of assessment. The BDI-II has excellent internal consistency (Cronbach’s $\alpha = 0.92$) and test-retest reliability ($r = 0.93$).

**Olfactory function**

Odor identification ability was measured using the Modified Brief Smell Identification Test (MB-SIT; Doty, Marcus, & Lee, 1996). The MB-SIT is a multiple-choice test with twelve different microencapsulated odors (e.g. banana, gasoline, soap). The specific odors were chosen because they were likely to be familiar to most people from North American, European, South American, and Asian cultures, and the test has been cross-culturally validated. Test-retest reliability is reasonable ($r = 0.71$) (Doty, McKeown, Lee, & Shaman, 1995). During administration, the researcher obtained information about the participant’s smoking habits and asked whether he or she had any known problems with smell or taste abilities. The researcher scratched each microencapsulated odor strip so that the method of scratching remained relatively
uniform for each participant and each item of the test. After the participant smelled the sticker, he or she matched the odor to one of four odor names. He or she then rated the odor’s perceived strength, pleasantness, and familiarity on seven-point Likert scales.

**Emotion and motivation**

Trait positive and negative affect were assessed with the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988). This scale lists ten terms describing positive affect states and ten terms describing negative affect states. These are rated on a 5-point scale, ranging from 1, *very slightly or not at all*, to 5, *very much*. The responder is instructed to rate each term based on how they generally feel, on average. Good internal consistency and fair test-retest reliability have been demonstrated for the positive affect (Cronbach’s $\alpha = 0.88$; $r = 0.68$) and negative affect subscales (Cronbach’s $\alpha = 0.87$, $r = 0.71$).

Anticipatory and consummatory pleasure were assessed with the Temporal Experience of Pleasure Scale (TEPS; Gard, Gard, Kring, & John, 2006). This scale was developed to assess in-the-moment pleasure (consummatory pleasure), as well as the pleasure experienced in anticipation of a positive experience (anticipatory pleasure). The 10-item anticipatory pleasure and 8-item consummatory pleasure subscales are rated on a 6-point scale ranging from 1, *very false for me*, to 6, *very true for me*. Acceptable internal consistency (Cronbach’s $\alpha > 0.71$) and test-retest reliability ($r > 0.75$) have been demonstrated for the total score, anticipatory pleasure, and consummatory pleasure subscales.
Trait-like motivation system sensitivity was assessed by the BIS/BAS scales (Carver & White, 1994). Individual differences in sensitivity to two physiological systems have been proposed to underlie human motivated behavior. The behavioral inhibition system (BIS) is the aversive motivational system, and is sensitive to signals of punishment, non-reward, and novelty. Its purpose is to inhibit behaviors that may lead to negative outcomes. In contrast, the behavioral activation system (BAS) is the appetitive motivational system, sensitive to signals of reward, non-punishment, and escape from punishment. Its purpose is to enhance a person’s movement toward goals. The BIS/BAS is a 21-item questionnaire containing one BIS subscale and three BAS subscales (reward responsiveness, drive, and fun-seeking), with each item rated on a 4-point scale, from 1, strongly agree, to 4, strongly disagree. The internal consistency of the subscales is reasonable to good (Cronbach’s $\alpha = 0.66$-$0.76$) and the test-retest reliability is fair ($r = 0.59$-$0.69$).

**Self-reported social attitudes and behaviors**

**Schizoid asociality.** Schizoid asociality was measured by the Revised Social Anhedonia Scale (RSAS; Eckblad, Chapman, Chapman, & Mishlove, 1982), a 40-item, true-false measure. The RSAS also contains six infrequently endorsed items used to exclude random responders. Participants who endorsed more than two of these items were excluded from the study; four of the original 37 participants were excluded from the analyses.
**Suspiciousness and hostility.** Suspiciousness was measured with the Paranoia Scale and the Paranoia/Suspiciousness Questionnaire. The Paranoia Scale (FVPS; Fenigstein & Vanable, 1992) is a 20-item scale with items rated on a five-point scale, from 1, *not at all applicable to me*, to 5, *extremely applicable to me*. The questionnaire has been documented to have good internal consistency (coefficient alphas > 0.81) and 6-month test-retest reliability (r = .70). The scale has been found to have a single underlying factor.

Suspiciousness was also measured using the Paranoia/Suspiciousness Questionnaire (PSQ; Rawlings & Freeman, 1997). This 47-item yes-no scale has been found to have five factors. The factors relevant to assessing suspiciousness are the Interpersonal Suspiciousness/Hostility (PSQ-IS) subscale and the Mistrust/Wariness (PSQ-MW) subscale. Hostility was assessed by the Anger/Impulsivity (PSQ-AI) and Perceived Hardship/Resentment (PH) subscales. Internal consistency is reasonable for all subscales; all Cronbach’s alphas were greater than 0.65, and all test-retest reliability correlations were greater than 0.59.

**Social anxiety.** The Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987) is a scale that presents 24 hypothetical social situations that are commonly feared and/or avoided by individuals with social phobia. It contains two subscales: an 11-item scale consisting of social interactional situations, and a 13-item scale consisting of performance situations. For each situation, it assesses both self-reported fear or anxiety (rated from 0, *none*, to 3, *severe*) and frequency of avoiding the situation (rated from 0, *never (0%)* to 3, *usually (67-100%)*). The LSAS generates six subscale scores: total fear/anxiety, social
interaction fear/anxiety, performance fear/anxiety, total avoidance, social interaction avoidance, and performance avoidance. The LSAS has excellent internal consistency (coefficient alphas > 0.81). As the LSAS was originally developed as a clinician-rated scale to assess the patient’s functioning during a one-week time period, the instructions were modified to specify that the responder should rate the items based on how they generally feel and behave.

Scale development

Like the RSAS, the Social Withdrawal Motivation Scale (SWiMS) was originally developed using a university undergraduate sample. Items for the scale were rationally derived. Clarity of meaning was considered particularly important in order to allow responders to judge whether the statements were accurate based on the particular motivation described in each statement. Each item was generated to tap one of four different motivations for social withdrawal: schizoid asociality, social anxiety, suspiciousness, and hostility, defined as follows:

1. Schizoid asociality: indifference to other people, reflecting an experience of a particularly low emotional response to others (i.e. neither a strong positive nor a strong negative response),
2. Social anxiety: fear or anxiety in social situations, particularly due to concerns about being unacceptable to or judged by other people,
3. Suspiciousness: a general tendency to distrust others or suspect their motives, due to a perception of others as hostile or manipulative,
4. Hostility: a general tendency to respond to others with anger, irritation, or dislike.

The items were administered to undergraduate students and the scale was refined until principle components analyses revealed four separate, reasonably internally-consistent factors corresponding to schizoid asociality (5 items), social anxiety (6 items), suspiciousness (5 items), and hostility (4 items), with a total of 20 items (Table 1). Each item is rated on a 4-point scale: 1, strongly disagree, 2, disagree, 3, agree, and 4, strongly agree. A 4-point scale was chosen because the true-false format of the RSAS could reduce variance and obscure important information; however, the true-false format was chosen in response to findings that, on 7-point scales, individuals with schizophrenia tended to respond using only the extreme and center positions (1, 4, and 7). A four-point scale allows for greater variance than a true-false scale, but removes the problem of a central position. Internal consistency was acceptable or good for each of the four subscales (Cronbach’s $\alpha = 0.70$-0.85).

Procedure

All participants were met with individually at a community mental health center. Each participant gave informed consent to participate in the study, participate in the video-recorded interviews, and allow the interviews to be used by the researchers. The measures were administered during one session lasting approximately two hours; participants were paid $50 for participating in this session.
Data Analysis

Internal consistency.

Cronbach’s alphas were computed to assess the internal consistency of the RSAS and each SWiMS subscale (schizoid asociality, suspiciousness, hostility, and social anxiety).

Convergent and discriminant validity.

Two-tailed Pearson correlations were conducted to test the hypotheses concerning the relationships between scores on the RSAS and SWiMS subscales and the other constructs of interest: psychiatric symptomatology, affect, emotion and motivation, social attitudes and beliefs, and olfactory functioning. If a construct was significantly related to the RSAS total score or to the SWiMS schizoid asociality score, a t-test was computed to determine whether there was a significant difference between the RSAS and SWiMS schizoid asociality correlation coefficients.

Independent-samples t-tests were conducted to compare the deficit and non-deficit schizophrenia groups with respect to the RSAS and SWiMS subscale scores.
Results

Preliminary Analyses

Means and standard deviations for all measures are presented in Table 3. Analyses were conducted to determine whether demographic variables were related to RSAS scores and SWiMS subscale scores. Two-tailed Pearson correlations were conducted to determine whether the RSAS and SWiMS subscales were related to participants’ age and highest education obtained. Neither of these variables were significantly related to scores on the RSAS or SWiMS subscales. T-tests were computed to determine whether scores on RSAS or SWiMS subscale scores were related to participants’ sex; none of the scales showed significant sex differences.

T-tests were computed to determine whether scores on any measures were related to participants’ race. As there was only one Asian participant, the analysis focused on determining whether there were differences between Caucasian and African American participants. The difference in RSAS scores approached significance, $t(30) = 1.943$, $p = .061$. On the RSAS, African American participants’ mean score ($M = 19.20$, $SD = 8.12$) was higher than Caucasian participants’ mean score ($M = 12.57$, $SD = 7.37$; Table 4). African American and Caucasian participants’ SWiMS subscale scores did not significantly differ.

Internal consistencies of the RSAS and each SWiMS subscale were assessed by computing Cronbach’s alpha for each scale. The RSAS had good internal consistency ($\alpha$
The SWiMS subscales varied in internal consistency; SWiMS-HOS ($\alpha = 0.78$) had good internal consistency, while SWiMS-SAX ($\alpha = 0.69$), SWiMS-SUS ($\alpha = 0.63$) and SWiMS-SZA ($\alpha = 0.66$) had acceptable internal consistency. The SWiMS, as a whole, had good internal consistency ($\alpha = 0.85$).

Tests of Hypotheses

Hypothesis 1: RSAS discriminant validity.

a. Higher scores on the RSAS will be related to elevated active social withdrawal, social anxiety, suspiciousness, and hostility.

Two-tailed Pearson correlations were conducted to test this hypothesis. The majority of the correlations were in the expected direction, although not all were significant. Higher scores on the RSAS were associated with higher scores on PANSS active social avoidance (Table 6), FVPS suspiciousness, and PSQ-AI subscale ($r = 0.548$, $r = 0.368$, $r = 0.461$, respectively; Table 5). Positive correlations between the RSAS and PSQ IS/H ($r = 0.297$), and the RSAS and PSQ-MW ($r = 0.334$) approached significance. Scores on the RSAS were not significantly related to LSAS (Table 5) or PANSS hostility or suspiciousness/persecution scores (Table 6).

b. Higher scores on the RSAS will be related to elevated trait negative affect, current anxiety, and current depression.

Two-tailed Pearson correlations were conducted to test this hypothesis. All correlations were in the expected direction; higher scores on the RSAS were related to higher PANSS anxiety, PANSS depression, and BDI-II scores ($r = 0.376$, $r = 0.383$, $r = 0.422$, respectively;
Tables 5 & 6). Scores on the RSAS were not significantly related to PANAS-NA scores (Table 5).

c. **Higher scores on the RSAS will be related to elevated general avoidance motivation.**

There was no significant correlation between RSAS and BIS scores; higher scores on the RSAS were not related to elevated general avoidance motivation (Table 5).

d. **Higher scores on the RSAS will be related to categorization in the non-deficit schizophrenia group.**

An independent-samples t-test was conducted to compare RSAS scores between the non-deficit (N = 21, M = 18.00, SD = 9.29) and deficit (N = 8, M = 15.38, SD = 4.69) schizophrenia groups. Although the non-deficit schizophrenia group had a higher mean score on the RSAS, the difference between the groups was not significant, t(27) = -0.76, p > 0.05 (Table 7).

**Hypothesis 2: SWiMS Schizoid Asociality discriminant validity.**

a. **SWiMS-SZA scores will not be related to elevated active social withdrawal, social anxiety, suspiciousness, or hostility.**

Two-tailed Pearson correlations were conducted to test this hypothesis. The hypothesis was partially supported. As predicted, SWiMS-SZA scores were not significantly correlated with scores on PANSS active social avoidance (Table 6), FVPS, or PSQ-IS/H (Table 5). However, contrary to expectations, a positive correlation with PSQ-AI approached significance (r = 0.340; Table 5). In addition to this, a positive correlation between SWiMS-SZA and LSAS Avoidance scores approached significance (r = 0.348);
however, scores on the SWiMS-SZA were not significantly correlated with LSAS Fear/Anxiety scores (Table 5).

b. **SWiMS-SZA scores will not be related to elevated trait negative affect, current anxiety, or current depression.**

Two-tailed Pearson correlations were conducted to test this hypothesis. This hypothesis was partially supported; as predicted, SWiMS-SZA scores were not significantly correlated with PANAS-NA, BDI-II or PANSS anxiety scores (Tables 5 & 6). However, higher SWiMS-SZA scores were associated with higher scores on PANSS depression (r = 0.426; Table 6).

c. **SWiMS-SZA scores will not be related to elevated general avoidance motivation.**

This hypothesis was supported; as predicted, there was no significant correlation between SWiMS-SZA and BIS scores (Table 5).

d. **Higher scores on the RSAS will be significantly more highly related to the aforementioned variables than higher scores on the SWiMS-SZA.**

T-tests were computed to determine whether there were significant differences between the RSAS and SWiMS-SZA correlation coefficients for all aforementioned significant correlations. The differences between the RSAS and SWiMS-SZA correlations with the variables of interest were not significant; therefore, the hypothesis was not supported. The difference between the correlations between PANSS Active Social Avoidance and the RSAS (r = .535) and SWiMS-SZA (r = .181) approached significance (t = 1.971, p =
.060; Table 5), suggesting the possibility that RSAS scores are more associated with active social avoidance than are SWiMS-SZA scores (Table 8).

**Hypothesis 3: SWiMS Schizoid Asociality convergent validity.**

a. **Higher scores on the SWiMS-SZA will be related to more elevated passive social withdrawal.**

The hypothesis was not supported; there was no significant correlation between the SWiMS-SZA score and PANSS passive/apathetic social withdrawal score (Table 6).

b. **Higher scores on the SWiMS-SZA will be related to lower general approach motivation.**

This hypothesis was not supported; there was no significant correlation between the SWiMS-SZA and BAS scores (Table 5).

c. **Higher scores on the SWiMS-SZA will be related to lower trait positive affect.**

This hypothesis was not supported; there was no significant correlation between the SWiMS-SZA and PANAS-PA scores (Table 5).

d. **Higher scores on the SWiMS-SZA will be related to lower consummatory pleasure.**

This hypothesis was supported. As predicted, there was a significant negative correlation between the SWiMS-SZA and TEPS Consummatory subscale scores (Table 5).

e. **Higher scores on the SWiMS-SZA will be related to a greater deficit in smell identification ability.**

This hypothesis was not supported; there was no significant correlation between the SWiMS-SZA and MB-SIT scores (Table 5). The majority of the sample reported that
they smoked (N = 18, 54.5%); a t-test was performed to determine whether MB-SIT scores differed between smokers and non-smokers. Smokers’ scores on the MB-SIT (M = 10.06, SD = 1.30) did not differ significantly from non-smokers’ scores (M = 10.57, SD = 1.22), t(30) = 1.14, ns. In addition, there appeared to be a ceiling effect on the MB-SIT. The highest possible score on the MB-SIT is 12, and the average score in this sample was particularly high (M = 10.33, SD = 1.29; Table 3).

**f. Higher scores on the SWiMS-SZA will be related to categorization in the deficit schizophrenia group.**

An independent-samples t-test was conducted to compare SWiMS-SZA scores between the non-deficit (N = 19, M = 13.47, SD = 3.60) and deficit (N = 8, M = 10.50, SD = 2.20) schizophrenia groups. Although the difference between the groups was significant at the .05 level, (t(25) = 2.160, p = .041; Table 6) the hypothesis was not supported. Contrary to the prediction, the non-deficit schizophrenia group had higher SWiMS-SZA scores than the deficit schizophrenia group.

**g. Scores on the SWiMS-SZA will be significantly more highly related to the aforementioned variables than scores on the RSAS.**

Due to the lack of significant correlations between the SWiMS-SZA and passive/apathetic social withdrawal, general approach motivation, trait positive affect, and smell identification, these follow-up analyses were not completed.

**Hypothesis 4: Convergent validity of other SWiMS subscales.**
a. Higher scores on the SWiMS suspiciousness, hostility, and social anxiety subscales will be related to more elevated self-report and interview-rated measures of their respective constructs.

Two-tailed Pearson correlations were conducted to test these hypotheses.

i. SWiMS suspiciousness.

This hypothesis was largely supported; higher scores on SWiMS-SUS were associated with higher scores on self-report measures of suspiciousness: PSQ-IS/H, PSQ-MW, and FVPS (r = .375, r = .420, r = .396, respectively; Table 5). However, the correlation with PANSS suspiciousness was not significant (Table 6).

ii. SWiMS hostility.

The SWiMS-HOS subscale demonstrated good convergent validity. Higher scores on SWiMS-HOS were associated with higher scores on PSQ-IS/H, PSQ-AI, and PSQ-PH (r = .544, r = .812, r = .575, respectively; Table 5). A positive correlation with PANSS hostility approached significance (r = .346; Table 6).

iii. SWiMS social anxiety

Results suggested that the SWiMS-SAX subscale did not have adequate convergent validity. Scores on SWiMS-SAX were not significantly associated with LSAS-FA or LSAS-AV scores (Table 5). A positive correlation with PANSS anxiety approached significance (r = .358; Table 6).

b. Higher scores on the SWiMS suspiciousness, hostility, and social anxiety subscales will be related to higher general avoidance motivation.
This hypothesis was not supported; correlations between the aforementioned SWiMS subscales and BIS scores were not significant. However, a positive correlation between SWiMS-HOS scores and BAS scores approached significance ($r = .329$; Table 5), suggesting that individuals with elevated hostility may have higher approach motivation rather than high avoidance motivation. This is consistent with previous research suggesting that high levels of trait anger are associated with higher scores on BAS (Harmon-Jones, 2003).

c. Higher scores on the SWiMS suspiciousness, hostility, and social anxiety subscales will be related to higher trait negative affect.

This hypothesis was partially supported. Higher SWiMS-HOS ($r = .517$) and SWiMS-SAX ($r = .423$) scores were related to higher PANAS-NA scores (Table 5). However, SWiMS-SUS scores were not significantly related to PANAS-NA scores ($r = .282$; Table 5).

d. Higher scores on the SWiMS suspiciousness, hostility, and social anxiety subscales will be related to categorization in the non-deficit schizophrenia group.

Independent-samples T-tests were conducted to compare the deficit and non-deficit schizophrenia groups’ scores on the SWiMS-SUS, SWiMS-HOS, and SWiMS-SAX. The hypothesis was not supported; the difference between the deficit and non-deficit schizophrenia groups’ scores was not significant for any of these SWiMS subscales (Table 7).
Analysis of Race Effect

In preliminary analyses, a race effect approached significance for the RSAS, which was a main variable of interest. African American participants’ mean score on the RSAS was higher than Caucasian participants’ mean score. To determine if race affected the results, additional analyses were performed with the significant or trend-level significant correlations with the RSAS; these analyses were computed separately for the African American participants (N = 25) and the Caucasian participants (N = 7). These were then compared to the correlation coefficients for the full sample of participants.

The correlation coefficients in both the full sample and the African American sample were comparable in magnitude, and were correlated in the same direction (Table 9). This pattern, however, was not replicated in the Caucasian sample, particularly for the self-report variables. None of the variables with significant positive correlations in the full and African American samples were significantly correlated in the Caucasian sample. Furthermore, in the Caucasian sample, most of these correlations were in the negative direction. These variables included PSQ-IS, PSQ-NM, PSQ-MW, BDI-II, and FVPS (Table 9). Also notable was a difference in the correlations between the RSAS and PANAS-NA. Although this correlation was not significant and did not approach significance in the full sample of participants, there was a significant positive correlation between the RSAS and PANAS-NA in the African American sample ($r = .475, p = .022$), and a large, though non-significant negative correlation between these variables in the Caucasian sample ($r = -.555, p = .196$). In sum, the positive correlations between the
RSAS and suspiciousness, hostility, and depression in the full sample seem to have been largely driven by the African American subset of the sample.

**Item-Level Exploratory Analyses**

Hypothesis testing suggested that the RSAS might lack discriminant and convergent validity, and the SWiMS-SZA might lack convergent validity. However, individual items from the scales might show more content validity than the scales as a whole. If the RSAS and SWiMS-SZA items most highly related to schizoid asociality can be determined, this information could be used to re-analyze data that has previously been collected using the RSAS. It could also lead toward the creation of a more valid schizoid asociality self report scale by improving the SWiMS.

In these analyses, correlations were computed between individual items of the RSAS and SWiMS-SZA and all the criterion variables from the original hypotheses (i.e. the PANSS items and self-report measures). Items with a pattern of significant correlations suggesting both good discriminant validity and convergent validity were also retained. Specifically, items were retained if they:

1. Demonstrated good discriminant validity by having non-significant correlations, or significant negative correlations, with: LSAS-FA, all PSQ subscales, BDI-II, FVPS, PANAS-NA, and PANSS suspiciousness, hostility, anxiety, depression, and active social avoidance,
2. Demonstrated good convergent validity by having significant negative correlations with: PANAS-PA, BAS, BIS, MB-SIT, TEPS-ANT, and/or TEPS-CONS,

3. Demonstrated good convergent validity by having significant positive correlations with PANSS emotional withdrawal and/or PANSS passive/apathetic social withdrawal.

The items meeting these criteria included RSAS items 9, 10, 12, 31, and 36. No SWiMS-SZA items met the validity criteria. See Table 10 for these items and correlation coefficients. The five items with good discriminant and convergent validity seemed to reflect two characteristics: low emotional involvement with others, and a preference for being alone despite opportunities to socialize. Future studies could measure schizoid asociality using a subscale derived from these items.


Discussion

Summary of Findings

This study explored the construct validity of two self-report scales intended to measure a specific motivation for social withdrawal – schizoid asociality, which is a passive form of social withdrawal and an attenuated form of a schizophrenic negative symptom. The well-established Revised Social Anhedonia Scale (Eckblad et al., 1982) was compared with the Social Withdrawal Motivation Scale (SWiMS), which this study aimed to develop.

The results showed that the hypotheses were partially supported. Higher RSAS scores were associated with higher scores on measures of suspiciousness, hostility, depression, and anxiety. Although the RSAS is intended to measure only schizoid asociality, it appears to largely tap forms of active social withdrawal, in addition to general negative mood. The findings were substantiated by the use of a multitrait-multimethod matrix approach to data collection. Self-report and interviewer-rated measures were used to measure the same constructs, and the results of both methods were largely similar.

The results partially supported the hypothesis that the SWiMS schizoid asociality subscale (SWiMS-SZA) would show better discriminant validity than the RSAS. On all of the self-report measures, higher SWiMS-SZA scores were not significantly associated with variables suggesting active social withdrawal and negative mood. In contrast, scores
on the interviewer-rated measure of depression did not suggest that the SWiMS-SZA has adequate discriminant validity – individuals with higher scores on SWiMS-SZA had higher ratings of depression.

The self-report measures also suggested that the SWiMS might have slightly better convergent validity than the RSAS. Among these measures, higher SWiMS-SZA scores were significantly associated with ratings of lower consummatory pleasure. In addition, an association between SWiMS-SZA scores and social avoidance on a social anxiety scale closely approached significance. Higher SWiMS-SZA scores were associated with higher social avoidance. This is notable because SWiMS-SZA scores were not associated with the social fear or anxiety subscale on the same social anxiety measure.

However, the majority of the measures intended to establish convergent validity did not support adequate convergent validity of the SWiMS-SZA. The hypotheses predicted that the SWiMS-SZA would be associated with higher scores on measures of odor identification, passive social withdrawal, and emotional withdrawal, and lower scores on measures of trait positive emotion and behavioral activation. The SWiMS-SZA was not significantly correlated with any of these criterion measures. Higher SWiMS-SZA scores were also associated with participants’ categorization in a non-deficit schizophrenia group, rather than being associated with the deficit schizophrenia group, as was hypothesized.
Interpretation of Findings

Consistent with hypotheses.

Consistent RSAS findings. It was hypothesized that scores on the RSAS would not adequately discriminate between schizoid asociality and active forms of social avoidance. The findings generally supported this hypothesis. Higher scores on the RSAS were related to higher levels of constructs indicating active social avoidance, such as suspiciousness and anxiety. Previous studies have also shown that the RSAS does not have adequate discriminant validity. Some studies have suggested that the RSAS does not discriminate between active and passive social withdrawal (Bailey, West, Widiger, & Freiman, 1993; Bell et al., n.d.; Blanchard, Mueser, & Bellack, 1998; Widiger, Freiman, & Bailey, 1990), while others show that it taps positive schizotypy in addition to negative schizotypy (Fonseca-Pedrero, et al., 2010; Kwapil, Barrantes-Vidal, & Silvia, 2008; Lewandowski et al., 2006a).

There are several reasons why the RSAS might be significantly related to characteristics and symptoms it is not intended to measure. The wording of some items is ambiguous as to what reasons for social withdrawal the individual should consider when responding. To a person with elevated anxiety, items such as “I prefer watching television to going out with other people” might elicit a “true” response due to fear of others’ judgment, and the relative comfort of social withdrawal. To a person with elevated suspiciousness, items such as “People are usually better off if they stay aloof from emotional involvements with most others” might presumably reflect the relative safety of maintaining privacy. A person with elevated hostility might feel that a
negatively valenced word (“resent”) reflects their feelings toward others in an item such as “When I am alone, I often resent people telephoning me or knocking on my door.” The lack of face validity of these and other RSAS items highlights the need for items that more clearly describe schizoid social withdrawal.

The original validation of the RSAS involved comparing individuals’ scores with their responses on clinical interviews. Although this is an appropriate method of validating this type of scale, the specific target variables may not have been optimal criteria to distinguish schizoid asociality from active social withdrawal. Interviewer ratings of social adjustment produced scores on global domains and facets of adjustment. Compared to a control group, socially anhedonic individuals received significantly lower ratings on many ratings of social adjustment (Mishlove & Chapman, 1985). The facets, however, are ambiguous enough that any of these ratings might also be significantly lower in individuals with active social withdrawal (e.g. facets such as social discomfort, social friction, lack of friends). It has been established that individuals with schizophrenia tend to exhibit a decline in social functioning prior to their first episode of psychosis (Allen, Frantom, Strauss, & van Kammen, 2005), but not all individuals with schizophrenia present with negative symptoms such as schizoid asociality. In addition, individuals with affective psychoses also exhibit deficits in social functioning prior to the onset of their illness (Cannon et al., 1997). Low social adjustment might be characteristic of individuals at high risk for psychosis, and it appears to be associated with social withdrawal, but low social adjustment is not necessarily associated with a particular type
of social withdrawal. A social adjustment criterion is not specific enough to infer that a scale is measuring schizoid asociality.

In addition, Mishlove and Chapman (1985) determined the construct validity of the RSAS with an interview to assess psychosis proneness and schizotypal features in the sample. The interview was created by the authors and included assessments of various forms of schizotypal traits, consisting of subclinical psychoticlike experiences. These included symptoms that fit into the following categories: derealization/depersonalization, sensory abnormalities, abnormal cognitive experiences, and loss of emotions. At the time of the publication, these were considered the prototypical schizotypal traits, although some have been less emphasized in recent years. The interview also assessed depression. The analyses concerning the relationship between the RSAS and psychoticlike experiences, schizotypal traits, and depression revealed that, for women, these were not related to social anhedonia. Further analyses were conducted using the male subjects only. Unfortunately, the analyses did not consider the categories of psychoticlike experiences separately, and were conducted using the one scale of psychoticlike experience for which each subject received the highest score. Therefore, it is not known what psychoticlike experiences were actually associated with the RSAS. “Loss of emotions” appears to be the only experience the authors assessed that is clearly related to schizoid asociality, and it is unclear how this was defined. It is unknown whether or not scores on the RSAS were related to this variable in particular.

**Consistent SWiMS findings.** Findings concerning the SWiMS subscales were also consistent with some of the relevant hypotheses. SWiMS-SZA scores were
negatively correlated with a measure of consummatory pleasure, defined as the “in the moment” pleasure a person feels while directly experiencing normally pleasurable stimuli (Gard, Kring, Gard, Horan, & Green, 2007). On the other hand, anticipatory pleasure is defined as the person’s experience of pleasure when predicting that one will enjoy a future experience. A person with schizoid traits, by definition, would have a low capacity to experience pleasure in normally pleasurable activities (i.e. to have low consummatory pleasure). A person with intact capacity for positive emotions might enjoy anticipating pleasurable activities, and the intact capacity for positive emotions would also allow normal experiences of “in the moment” pleasure. The fact that those with higher SWiMS-SZA scores had lower consummatory pleasure means that the SWiMS-SZA might be measuring schizoid asociality, as intended.

An association between higher SWiMS-SZA scores and higher social avoidance scores on a social anxiety measure approached significance. Higher SWiMS-SZA scores were not, however, associated with the social fear or anxiety subscale on the same social anxiety measure. This might suggest that, although individuals with high SWiMS-SZA scores do not choose to engage in social interactions, anxiety is not their motivation to avoid social interactions. It is, however, possible that they are not engaging in these situations due to another reason for active social avoidance. For example, on an interviewer-rated measure, the SWiMS-SZA was associated with higher levels of depression, which might involve episodic apathetic social withdrawal.

Results for the analyses of the SWiMS-HOS subscale were generally consistent with the hypotheses. It appeared to have adequate convergent validity, because it had
positive correlations with all other self-report and interviewer-rated scales measuring constructs related to hostility. It also had a significant positive correlation with the trait negative affect scale. The items on the hostility subscale might have been particularly face-valid. This was also the only subscale of the SWiMS that did not contain reverse-keyed items, which could have enhanced the clarity of the items for the participants. Results for the analyses of the SWiMS-SUS subscale were also partially consistent with the hypotheses. Higher scores on the SWiMS-SUS were associated with higher scores on self-report measures reflecting suspiciousness and paranoia. Overall, the SWiMS-SAX, SWiMS-SUS, and SWiMS-HOS tended to be correlated with the same criterion variables. This may be because all three subscales measure types of active social avoidance motivation, as do the constructs with which they are correlated.

Inconsistent with hypotheses.

Inconsistent RSAS findings. The hypothesis that higher RSAS scores would be associated with higher scores on a measure of general avoidance motivation was not supported in this study. The RSAS was associated with higher specific social withdrawal motivations that are associated with active avoidance of social situations. However, individuals with avoidant social withdrawal motivations may not have a general tendency toward avoidant withdrawal. The RSAS items ask participants about social situations; in contrast, only two items on the avoidance motivation scale specifically asked about social situations. The finding that the RSAS is measuring only social constructs is reasonable, as this is what it was intended to measure, and the majority of the items could be considered particularly face valid in regard to their focus on social situations.
In addition, the choice of general avoidance motivation might not have been the most optimal criterion measure. It was chosen as a criterion measure because of the general assumption that schizoid traits include a fundamental reduction in the range of emotional intensity, and that a consequence of a reduced range of emotional intensity would be reduced volition, also considered a schizoid trait. Reduced volition would be a likely consequence of reduced range of emotional intensity because in order to experience motivation, whether approach or avoidance motivation, it is necessary to experience an emotional reaction to reward and punishment. In theory, a consequence of general reduced volition would be reduced social volition - i.e. schizoid asociality. However, it is possible that, in this case, theory is not consistent with reality.

**Inconsistent SWiMS-SZA findings.** It was hypothesized that higher scores on the SWiMS-SZA would not be associated with higher scores on measures of depression. Although the findings regarding the self-report measure of depression supported this hypothesis, this hypothesis was not supported with regard to the interviewer-rated measure of depression. Higher interviewer-rated depression was associated with higher SWiMS-SZA scores. The SWiMS-SZA is intended to measure a trait-like apathetic response to social situations. However, its items might not be ideal for implying a trait rather than a state. The anhedonia associated with depression, while generally considered to be transient, is a deficiency in approach motivation rather than an excess of avoidance motivation. Therefore, besides its episodic nature, it is quite similar to the construct of schizoid asociality. In the development of the SWiMS, there could have been inadequate attention paid to the development of items that clearly reflect long-standing trait-like
motivations. An individual responding to the items on the SWiMS-SZA could respond to most of them in relation to their current affective and motivational state. Since trait versus state is the only major difference between depressive anhedonia and schizoid asociality, this could have led to the significant overlap between scores on the SWiMS-SZA and interviewer-rated depression. Another possible explanation for this finding is that, to a clinical rater, schizoid asociality often has the appearance of depression. In this case, the participant’s self-reported level of depression might be a more accurate criterion measure than the interviewer’s clinical rating.

It was expected that individuals who were identified as having the deficit syndrome of schizophrenia would receive higher scores on the SWiMS-SZA than those with non-deficit schizophrenia. This hypothesis was not supported, and in fact, the findings were the opposite of what was hypothesized: individuals with non-deficit schizophrenia had higher scores on the SWiMS-SZA. The deficit syndrome is a constellation of stable, primary negative symptoms that is characteristic of certain individuals with schizophrenia. Conversely, individuals with the non-deficit form of schizophrenia either do not have negative symptoms, or have negative symptoms that are secondary to factors such as depression, suspiciousness, or medication side effects. The SWiMS-SZA was essentially developed to assess a stable, primary negative symptom, like the symptoms that are characteristic of individuals with deficit schizophrenia.

The fact that those with non-deficit schizophrenia scored higher on the SWiMS-SZA is particularly problematic for the validity of this subscale. This could be due to inadequate validity of the SWiMS-SZA, to problems with the criterion measures, or to
issues fundamental to the concepts of schizoid asociality and deficit schizophrenia. As discussed previously, the SWiMS-SZA is related to higher interviewer ratings of depression. The relationship of depression to the SWiMS-SZA might also affect the relationship of non-deficit schizophrenia to the SWiMS-SZA, as individuals with non-deficit schizophrenia would be expected to experience more depression than those without deficit schizophrenia, and indeed had higher scores on interviewer-rated depression than the deficit schizophrenia group.

Scores on the SWiMS-SZA were also unrelated to general approach motivation. Individuals with higher schizoid asociality were expected to experience lower general approach motivation. As discussed with regard to RSAS validity, general approach motivation refers to a consistent tendency toward a reduced ability to increase behaviors in response to rewards. An individual with elevated schizoid asociality would be expected to be low in approach motivation because they do not experience as much pleasurable reward in socializing; this is in contrast to a person who either has an intact capacity to experience social situations as rewarding, or has a greater tendency to experience social situations as aversive (avoidance motivation). The individual with schizoid asociality would not experience these situations as aversive, but simply experience them as not rewarding enough to pursue them. It would be expected that a schizoid asociality scale with good discriminant validity would be unrelated to general avoidance motivation; however, for a schizoid asociality scale to have good convergent validity, higher scores on the scale would need to be related to lower approach motivation.
The non-significant relationship between the SWiMS-SZA and general approach motivation might have been an issue with the general approach motivation measure used in this study (Behavioral Activation Scale [BAS]). This scale is likely a flawed criterion for the SWiMS. The SWiMS is intended to measure social motivation, and therefore, the items contain social content. The BAS, however, does not contain any items tapping social motivation. Comparing a scale measuring a general construct to one measuring a closely-related but more specific construct might have affected the results by attenuating the relationship. The same issue could have affected the relationship between the SWiMS-SZA and another criterion: trait positive affect. Higher scores on the SWiMS-SZA were hypothesized to be associated with lower scores on a measure of trait positive affect (Positive and Negative Affect Scale [PANAS]); however, scores on these scales were unrelated. As affect is tied to motivation, individuals with a lower capacity for experiencing positive affect would likely experience less approach motivation, because a reduced capacity for positive affect would reduce the individual’s capacity to respond to reward. As with the BAS, the PANAS does not contain any items tapping affect that are specifically related to social situations, and therefore the same problems would apply to the PANAS as to the BAS.

It was hypothesized that there would be a relationship between high scores on the SWiMS-SZA with low odor identification ability, but there was no significant relationship between these two measures. In previous studies, deficits in odor identification ability were associated with deficit schizophrenia, and were more specifically associated with low social motivation. Since the SWiMS-SZA is intended to
measure a construct quite similar to this characteristic of deficit schizophrenia, one would expect that a valid schizoid asociality scale would also be related to a reduced ability to identify odors. Although odor identification does not appear to be related to generalized cognitive deficits in schizophrenia (Moberg, Agrin, Gur, Turetsky, & Doty, 1999), it is possible that odor identification deficits might be more fundamentally associated with more specific cognitive deficits in schizophrenia. For example, it has been found that smell identification is associated specifically with verbal ability in a sample of psychologically healthy individuals (Finkel, Pedersen, & Larsson, 2001). No studies to date have explored the association of smell identification with social cognitive deficits in schizophrenia; if present, this association could be driving previously observed relationships between smell identification and social drive in schizophrenia.

In the current study, there was also a ceiling effect on MB-SIT scores. In fact, the mean score on the MB-SIT for this patient sample was more comparable to typical mean scores in healthy control samples (Goudsmit et al., 2003; Kamath & Bedwell, 2008; Strauss, Allen, Ross, Duke, & Schwartz, 2010). Many of the odor choices within each item could likely be particularly easy to distinguish for most individuals (e.g. banana and gasoline), which might have contributed to the ceiling effect observed in this sample. Finally, it was considered that participants who smoke could show decreased odor identification ability, thus affecting the results of the relevant analyses. Since a majority of the participants were current smokers, they were not ruled out of the relevant analyses. Individuals who currently smoke did not demonstrate lower odor identification than those
who did not smoke, which is consistent with previous findings (Coleman et al., 2002; Goudsmit et al., 2003).

**Inconsistent findings for other SWiMS subscales.** The SWiMS-HOS was associated with higher scores on the self-report depression scale and with higher scores on the self-report paranoia scale. The SWiMS-SUS was also associated with higher scores on the self-report depression scale. These findings could be attributed to a tendency for the subscales to tap general dysphoria in addition to the concepts they are intended to measure. Social isolation could be an attempt to relieve the distress of suspiciousness and hostility toward others; it could, instead, result in the precipitation or exacerbation of depressive symptoms due to a lack of social support. In addition, hostility and suspiciousness could accompany each other because of a tendency to experience reciprocal anger toward others who are perceived to be hostile.

The findings regarding the SWiMS-SAX were the least consistent with the hypotheses. Higher scores on the SWiMS-SAX were associated with higher self-reported suspiciousness/hostility, anger/impulsiveness, and perceived hardship and resentment. These relationships could have resulted from a tendency to react to perceived judgment and persecution by others with feelings of anxiety. They could also have resulted from higher levels of general dysphoric mood in individuals with social anxiety.
Effect of Race on RSAS Findings

The findings regarding the RSAS appear to have been largely driven by the African American participants in the sample. In the full sample and the African American sample, the RSAS showed significant positive correlations with depression, suspiciousness, and hostility. In the small subset of Caucasian participants, however, the RSAS was more often negatively correlated with these variables, as would be expected if the RSAS were a valid measure of schizoid asociality. It is possible that the RSAS is a more valid measure of schizoid asociality for Caucasian individuals with schizophrenia than for African American individuals with schizophrenia (for whom scores are more likely to reflect suspiciousness, hostility, and/or depression). The RSAS was originally developed on an entirely Caucasian sample (Mishlove & Chapman, 1985). In addition, the original longitudinal studies of psychosis proneness were limited to Caucasian participants (Chapman et al., 1994; Kwapiel et al., 1997). Subsequent studies have found that African Americans tend to have significantly higher scores on the RSAS than Caucasian subjects. However, in this particular study, the sample of Caucasian participants is too small to make valid conclusions.

Exploratory Analyses

Due to the mixed results of hypothesis testing, exploratory analyses were conducted to help determine directions for future study. In particular, they were expected to guide modifications to improve the validity of self-report scales measuring schizoid asociality. The major hypotheses of the main study were tested again for each individual
item on the SWiMS-SZA and RSAS in order to find individual items that had better construct validity than the scales as a whole. Five items from the RSAS met the established parameters. The wording of these items appears to reflect low emotional involvement with others, and a desire for solitude despite opportunities to socialize.

Two of the items reflect low emotional involvement with others. These items specifically describe particularly close emotional involvements with other people; “I sometimes become deeply attached to people I spend a lot of time with [R]” is clear in its reference to a very close emotional involvement, implying a desire to seek contact and intimacy with others. “When someone close to me is depressed, it brings me down also [R]” implies an attachment to another person that is strong enough for the other person’s unpleasant emotions to similarly affect the responder’s own emotional state. A “false” response to these statements suggests a particularly low capacity for emotional response to other people. One would expect that a person who is socially anxious, suspicious, hostile, or depressed still maintains a capacity for emotional closeness, but finds barriers to achieving it – for example, in fears of negative evaluation or persecution, or in a temporary reduction in motivation. Someone who reports spending a lot of time with people with whom he or she never becomes deeply attached, or who reports being unable to empathize with someone he or she considers to be a friend, is probably expressing a “characterological defect” in the ability to experience pleasure in the act of having a close friendship with another person.

Three of the items reflected a desire for solitude despite the opportunity to socialize. One would expect a person who is actively socially withdrawn to still be
capable of experiencing feelings of loneliness. This person might actively avoid social situations because he or she experiences them as, or expects them to be, unpleasant. For the actively socially withdrawn person, there is still an intact capacity to enjoy socializing, but emotional barriers prevent it. The person is aware, on some level, that if these barriers were removed (e.g. a person with high social anxiety receives treatment and reduces social anxiety as a barrier), then socializing would be desirable and pleasant, and social isolation would lead to feelings of loneliness. On the other hand, for the passively socially withdrawn person, the barrier is the fact that the capacity itself is lacking. An intact capacity for experiencing social pleasure that is hindered by an emotional barrier could be restored by removing the barrier; a trait-like lack of capacity for social pleasure is the barrier, but it is one that cannot simply be removed. Since, for this person, socializing was likely never interesting or enjoyable, loneliness and a longing for interaction would not be readily experienced. The difference between the actively socially withdrawn person and the passively socially withdrawn person is captured well in the item “People sometimes think that I am shy when I really just want to be left alone.” Shyness generally implies some level of social anxiety; this is an emotional barrier that others might feel they can remove by helping the socially anxious person feel comfortable. The person responding “true” to this item, however, is indicating that he or she is not uncomfortable socializing, per se, but that he or she is simply not interested in it.

These five items are clear in their description of fundamental characteristics of schizoid asociality – a reduction in the ability to form deep emotional attachments with
other people, and a concomitant preference for solitude. Thus, these items are able to capture the concept of schizoid asociality well enough to display a pattern of correlations with criterion measures that is consistent with this construct.

**Limitations**

**Sample.** This study selected participants from a population of individuals with schizophrenia and schizoaffective disorder because the RSAS is widely used to measure schizoid asociality in this population (Horan, Kring, & Blanchard, 2006). The SWiMS, like the RSAS, was originally developed using a sample of undergraduate students. Undergraduate students are more likely to have a wide continuum of psychiatric symptoms, with most of the undergraduate population experiencing minimal psychiatric symptoms. In addition, undergraduates have likely achieved a higher-than-average level of general functioning in order to attend college, and therefore would also be functioning better than a seriously mentally ill population. These differences between the sample for which both scales were originally developed and the sample used for this study could have affected the validity of the two scales; they could be associated with different variables in the two populations. In addition, the convergent validity of the SWiMS has not yet been explored in an undergraduate sample, and some of the criterion measures collected from this sample were different than those collected with the patient sample. Therefore, at this time, the convergent validity of the SWiMS cannot be compared between undergraduate and patient samples.
In addition to population differences in symptom severity and general functioning, cognitive functioning is an important difference between patient and undergraduate populations that might have affected the results of this study. Undergraduate samples are likely to have higher levels of cognitive functioning than a patient sample (Spaulding, Garbin, & Dras, 1989). Cognitive functioning appears to affect responding on self-report measures of emotional experience. Patients with schizophrenia report lower levels of non-current pleasure than controls, despite the fact that patients and controls report similar levels of in-the-moment pleasure (Gard, Kring, Gard, Horan, & Green, 2007). This discrepancy might stem from patients’ reliance on semantic memory to inform their self-report, when episodic memory would likely lead to more accurate reports of their emotional experience (Strauss & Gold, 2012). Because of patients’ cognitive deficits, episodic memories are more difficult to access; therefore, their reports might not be an accurate reflection of their actual experiences. The fact that the SWiMS was developed with a more cognitively-intact sample of individuals might make it more appropriate for assessing a healthy population than a patient population.

**Criterion variables.** As was previously mentioned, the criterion variables chosen to determine convergent validity of the RSAS and SWiMS might not have been ideal criterion variables. The variables that were chosen included trait positive affect, general approach motivation, smell identification, and interviewer-rated measures of deficit schizophrenia and passive social withdrawal. The latter measure specifically taps the construct that the RSAS and SWiMS-SZA are intended to measure. However, the other measures are deficient in certain ways. Deficit schizophrenia is determined by the
presence of certain levels of at least two deficit symptoms, which may or may not include the “diminished social drive” subscale, a deficit symptom analogous to schizoid asociality. Smell identification is an established correlate of deficit schizophrenia and the diminished social drive symptom in particular (Malaspina & Coleman, 2003), but it is not a direct measure of schizoid asociality, and as mentioned previously, could be more fundamentally associated with cognitive and social functioning deficits. In this sample, there was also a ceiling effect on smell identification scores. Trait positive affect and general approach motivation are basic characteristics that would theoretically be related to schizoid asociality; schizoid traits, in general, include low motivation and restricted range of affect. Although these would theoretically form the basis of schizoid asociality, these schizoid traits are not specific to asociality.

**Internal consistency of SWiMS subscales.** By most standards, the SWiMS-SZA, SWiMS-SUS, and SWiMS-SAX would be considered to have acceptable internal consistency. Their lower levels of internal consistency, however, could still call into question the results of the analyses involving these subscales. Although some argue that internal consistency has little relevance to the validity of personality measures (McCrae, Kurtz, Yamagata, & Terracciano, 2011), lower reliability still suggests the likelihood of lower validity, which could be an alternative explanation for some findings – for example, the finding that the SWiMS-SZA did not correlate with many criterion variables. The SWiMS was originally developed using a large undergraduate sample (N = 481), and in that sample, these three subscales all had good internal consistency (SUS: \( \alpha = 0.72 \); SAX: \( \alpha = 0.85 \); SZA = 0.71) This suggests that the SWiMS might be more
appropriate for use in assessing psychosis-proneness in a healthy population than in psychiatric population.

Future Directions

Criterion variables. Additional criterion variables to assess convergent validity of the RSAS and SWiMS could be included in future research. Although the RSAS is the most frequently used self-report measure of schizoid asociality, there are other measures available, as well. These include subscales of general personality and schizotypy scales, such as the Thinking and Perceptual Style Questionnaire’s social hypohedonia subscale (Linscott & Knight, 2004) and the Social Closeness subscale of the Multidimensional Personality Questionnaire (Patrick, Curtin, & Tellegen, 2002).

In addition to self-report measures specifically measuring schizoid asociality, other self-report measures of personality and temperament could be included as criterion variables in future studies. For example, one temperament variable to consider including is reward dependence. Reward dependence is a domain of temperament that indicates level of propensity toward warmth- and approval-based social attachment (Smith, Cloninger, Harms, & Csernansky, 2008), which one would expect to be low in individuals with high schizoid asociality. Low reward dependence is also a potential endophenotypic indicator of risk for schizophrenia-spectrum disorders (Smith et al., 2008). Reward dependence would therefore be a particularly relevant criterion for future scale development.
New clinical interviews have been developed with the intention of more accurately assessing negative symptoms, including asociality. The Clinical Assessment Interview for Negative Symptoms (CAINS; Kring, Gur, Blanchard, Horan, & Reise, 2013) is a clinical interview that was recently developed. It is intended to take into account the dysfunctional motivational processes underlying negative symptoms in schizophrenia. For this reason, the social engagement subscales of the CAINS might be useful criterion measures for self-report social withdrawal motivation scales.

**Translational research.** Social withdrawal motivation should fit within a wider network of correlates in predictable ways. Future studies could use a translational research approach to determine what other correlates could be explored in the context of social withdrawal motivation. This would involve applying theories and findings from basic science to clinical research, and these could include biobehavioral constructs.

One relevant biobehavioral construct would be social reward responsiveness. Social reward responsiveness refers to an individual’s capacity for learning behaviors that are contingent on social rewards – for example, the approval of one’s peers. This would be associated with individual differences in the brain’s reward processing systems, particularly the ventral striatum and amygdala (Kohls, Peltzer, Herpertz-Dahlmann, & Konrad, 2009). In theory, schizoid asociality would be associated with a lower capacity for social reward responsiveness. The reduced reward value of social interactions would lead to a general reduction in the motivation to seek them out. This is the essence of schizoid asociality, and thus, high scores on a valid self-report measure of schizoid asociality would be associated with lower social reward responsiveness. In addition,
scores on measures of avoidance-motivated social withdrawal would not be associated with social reward responsiveness.

**SWiMS modifications.** The SWiMS appears to be a promising measure of social withdrawal motivation, and its discriminant validity was generally found to be superior to the RSAS. However, the SWiMS has limitations in its convergent validity, and some aspects of discriminant validity. The low reliability of the SWiMS-SZA in this sample is also a concern that should be addressed by modifications to this particular subscale. In future studies, more potential SWiMS items could be generated to increase the possibility that more valid subscales might emerge. The current items could also be edited to increase their face validity. Items from a variety of established scales could be combined and analyzed in order to generate a single, concise scale consisting of the most valid possible items to measure the constructs in question. Finally, given the correlations of the SWiMS-SZA and RSAS with measures of depression, it could be prudent to include a depressive social withdrawal subscale in the SWiMS to allow responders to more clearly differentiate between depression-related withdrawal and schizoid asociality.
Summary and Conclusions

In the present study, two measures of social withdrawal motivation were compared to determine their relative discriminant and convergent validity. In particular, they were compared with regard to their ability to distinguish schizoid asociality from other forms of social withdrawal. Findings showed that the RSAS largely measured constructs associated with active social avoidance and depression, even though it is intended to measure schizoid asociality. In contrast, the SWiMS-SZA was not related to most of these active social avoidance constructs. Its discriminant validity, however, was not completely supported; notably, higher scores on the SWiMS-SZA were related to interviewer-rated depression and categorization in the non-deficit schizophrenia group. Neither the SWiMS-SZA nor the RSAS demonstrated adequate convergent validity. Finally, findings were mixed for the SWiMS active social avoidance subscales, with the SWiMS-HOS demonstrating the greatest validity, and the SWiMS-ANX demonstrating the least validity.

Although there remains room for improvement on the SWiMS, it seems to be a promising measure of several types of social withdrawal motivation. Exploratory analyses also suggested that some items from the RSAS might measure schizoid asociality better than the scale as a whole. There have been recent improvements in interviewer-rated clinical interviews that assess negative symptoms, but there is still a dearth of valid self-report measures of negative symptoms. New measures would be
useful for assessing risk status for schizophrenia-spectrum disorders, as well as guiding the development of specific psychological and pharmaceutical interventions for patients who have already developed these disorders.
Bibliography


Bell, E. K., Pochedly, J. T., Aakre, J. M., Seghers, J. P., McCleery, A., Divilbiss, M., & Docherty, N. M. (n.d.). Does the Revised Social Anhedonia Scale measure schizoid asociality, or negative affectivity and interpersonal attitudes?


Appendix

Social Withdrawal Motivation Scale (SWiMS) subscales

Suspiciousness
1. I try not to get too involved with others because I fear they may hurt me.
2. When people are being very nice, I don’t often wonder if they’re being fake [Reversed]
3. People are often not as trustworthy as they appear.
4. I believe I can trust most people. [Reversed]
5. Getting too emotionally involved with others is risky because they might take advantage of you.

Schizoid Asociality
1. I simply don’t have very strong feelings for other people one way or the other.
2. I don’t tend to connect with others emotionally.
3. Becoming emotionally attached to other people is enjoyable for me. [Reversed]
4. I don’t like to let people get close to me.
5. I mostly feel indifferent toward other people.

Hostility
1. I have a short temper.
2. People are often irritating to me.
3. I tend to dislike many people I’ve met.
4. I often get annoyed with friends and loved ones.

Social Anxiety
1. It is hard for me to develop friendships because I get anxious around other people.
2. I rarely start conversations with others because I’m afraid of what they might think of me.
3. I don’t tend to have many friendships because talking to others makes me nervous.
4. I don’t often become nervous around other people. [Reversed]
5. I tend to avoid social situations because I’m afraid people will not like me.
6. I don’t worry too much about other people not liking me. [Reversed]
### Tables

Table 1: Acronyms for measures used in analyses

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>RSAS</td>
<td>Revised Social Anhedonia Scale</td>
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<tr>
<td>SWiMS</td>
<td>Social Withdrawal Motivation Scale</td>
</tr>
<tr>
<td>SUS</td>
<td>Suspiciousness</td>
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<tr>
<td>SZA</td>
<td>Schizoid Asociality</td>
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<td>HOS</td>
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<td>SAX</td>
<td>Social Anxiety</td>
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<tr>
<td>LSAS</td>
<td>Liebowitz Social Anxiety Scale</td>
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<td>FA</td>
<td>Fear or Anxiety</td>
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<tr>
<td>AV</td>
<td>Avoidance</td>
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<td>PSQ</td>
<td>Paranoia/Suspiciousness Questionnaire</td>
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<tr>
<td>IS/H</td>
<td>Interpersonal Suspiciousness/Hostility</td>
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<tr>
<td>NM</td>
<td>Negative Mood/Withdrawal</td>
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<tr>
<td>AI</td>
<td>Anger/Intensity</td>
</tr>
<tr>
<td>MW</td>
<td>Mistrust/Wariness</td>
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<tr>
<td>PH</td>
<td>Perceived Hardship/Resentment</td>
</tr>
<tr>
<td>BIS</td>
<td>Behavioral Inhibition Scale</td>
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<tr>
<td>BAS</td>
<td>Behavioral Activation Scale</td>
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<td>Temporal Experience of Pleasure Scale</td>
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<td>Anticipatory pleasure</td>
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<td>Beck Depression Inventory - Revised</td>
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<td>FVPS</td>
<td>Fenigstein &amp; Vanable Paranoia Scale</td>
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<tr>
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<tr>
<td>PANAS</td>
<td>Positive And Negative Affect Scale</td>
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<tr>
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Table 2: Demographics

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<tr>
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<tr>
<td>Schizoaffective disorder (Depressive subtype)</td>
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<tr>
<td><strong>Race</strong></td>
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<td>Asian</td>
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<tr>
<td><strong>Education median (range)</strong></td>
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Table 3: Descriptive data

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<td>3.64</td>
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<td>45.03</td>
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<td>33.38</td>
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<td>16-46</td>
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<td>7-12</td>
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<td>25</td>
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PANSS = Positive And Negative Syndrome Scale; RSAS = Revised Social Anhedonia Scale; LSAS = Liebowitz Social Anxiety Scale; PSQ = Paranoia/Suspiciousness Questionnaire; SWiMS = Social Withdrawal Motivation Scale; BIS = Behavioral/Suspiciousness Questionnaire; BIS = Behavioral Activation Scale; TEPS = Temporal Experience of Pleasure Scale; BDI-II = Beck Depression Inventory – II; FVPS = Fenigstein & Vanable Paranoia Scale; MB-SIT = Modified Brief Smell Identification Test; PANAS = Positive And Negative Affect Scale.
Table 4: Demographic analyses

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<tr>
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<th>Sex</th>
<th>Race</th>
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<td></td>
<td>r</td>
<td>r</td>
<td>t</td>
<td>p</td>
</tr>
<tr>
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<td>-0.14</td>
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<tr>
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</tr>
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</tbody>
</table>

RSAS = Revised Social Anhedonia Scale; SWiMS = Social Withdrawal Motivation Scale (SUS = Suspiciousness, SZA = Schizoid Asociality, HOS = Hostility, SAX = Social Anxiety)
Table 5: Correlations between RSAS, SWiMS subscales, and self-report variables

<table>
<thead>
<tr>
<th></th>
<th>RSAS</th>
<th>SWiMS-SZA</th>
<th>SWiMS-SUS</th>
<th>SWiMS-HOS</th>
<th>SWiMS-SAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSAS</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>FA</td>
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<td>0.126</td>
<td>0.187</td>
<td>0.009</td>
<td>0.093</td>
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<td>0.216</td>
<td>0.348†</td>
<td>0.284</td>
<td>0.067</td>
<td>0.201</td>
</tr>
<tr>
<td>PSQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IS/H</td>
<td>0.297†</td>
<td>0.199</td>
<td>0.375*</td>
<td>0.544**</td>
<td>0.442*</td>
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<tr>
<td>NM</td>
<td>0.583**</td>
<td>0.239</td>
<td>0.484**</td>
<td>0.457*</td>
<td>0.24</td>
</tr>
<tr>
<td>Al</td>
<td>0.461**</td>
<td>0.340†</td>
<td>0.488**</td>
<td>0.812***</td>
<td>0.403*</td>
</tr>
<tr>
<td>MW</td>
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<td>0.168</td>
<td>0.420*</td>
<td>0.367*</td>
<td>0.176</td>
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<tr>
<td>PH</td>
<td>0.291</td>
<td>0.168</td>
<td>0.310†</td>
<td>0.575**</td>
<td>0.459**</td>
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<td>-0.129</td>
<td>0.189</td>
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<td>0.046</td>
<td>0.193</td>
<td>0.329†</td>
<td>0.183</td>
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<tr>
<td>TEPS</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>ANT</td>
<td>-0.217</td>
<td>-0.208</td>
<td>-0.013</td>
<td>-0.007</td>
<td>-0.096</td>
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<td>CONS</td>
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<td>-0.421*</td>
<td>-0.014</td>
<td>-0.022</td>
<td>-0.151</td>
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<tr>
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<td>0.275</td>
<td>0.403*</td>
<td>0.518**</td>
<td>0.22</td>
</tr>
<tr>
<td>FVPS</td>
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<td>0.286</td>
<td>0.396*</td>
<td>0.659***</td>
<td>0.473**</td>
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<tr>
<td>MB-SIT</td>
<td>0.145</td>
<td>-0.221</td>
<td>0.022</td>
<td>-0.017</td>
<td>-0.236</td>
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<td>PANAS</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA</td>
<td>-0.044</td>
<td>0.148</td>
<td>0.036</td>
<td>0.206</td>
<td>0.051</td>
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<td>0.149</td>
<td>0.282</td>
<td>.517**</td>
<td>.423*</td>
</tr>
</tbody>
</table>

*** p < 0.001, ** p < 0.01, * p < 0.05, † p < 0.1
RSAS = Revised Social Anhedonia Scale; SWiMS = Social Withdrawal Motivation Scale (SZA = Schizoid Asociality, SUS = Suspiciousness, HOS = Hostility, SAX = Social Anxiety); LSAS = Liebowitz Social Anxiety Scale (FA = Fear or Anxiety; AV = Avoidance); PSQ = Paranoia/Suspiciousness Questionnaire (IS/H = Interpersonal Suspiciousness/Hostility; NM = Negative Mood/Withdrawal; Al = Anger/Intensity; MW = Mistrust/Wariness; PH = Perceived Hardship/Resentment); BIS = Behavioral Inhibition Scale; BAS = Behavioral Activation Scale; TEPS = Temporal Experience of Pleasure Scale (ANT = Anticipatory; CONS = Consummatory); BDI-II = Beck Depression Inventory – II; FVPS = Fenigstein & Vanable Paranoia Scale; MB-SIT = Modified Brief Smell Identification Test; PANAS = Positive And Negative Affect Scale (PA = Positive Affect; NA = Negative Affect)
Table 6: Correlations between RSAS, SWiMS subscales, and Positive and Negative Syndrome Scale scores

<table>
<thead>
<tr>
<th></th>
<th>RSAS</th>
<th>SWiMS-SZA</th>
<th>SWiMS-SUS</th>
<th>SWiMS-HOS</th>
<th>SWiMS-SAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suspiciousness/Persecution</td>
<td>-0.11</td>
<td>-0.105</td>
<td>0.051</td>
<td>-0.06</td>
<td>0.032</td>
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<tr>
<td>Hostility</td>
<td>0.123</td>
<td>-0.083</td>
<td>0.159</td>
<td>0.346†</td>
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<td>Emotional Withdrawal</td>
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<td>-0.149</td>
<td>-0.097</td>
<td>-0.078</td>
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<td>Passive/Apathetic Social Withdrawal</td>
<td>0.211</td>
<td>-0.087</td>
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<td>0.053</td>
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<tr>
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<td>0.05</td>
<td>0.165</td>
<td>0.235</td>
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<tr>
<td>Depression</td>
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<td>0.426*</td>
<td>0.185</td>
<td>0.279</td>
<td>0.486*</td>
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<td>Active Social Avoidance</td>
<td>0.548**</td>
<td>0.122</td>
<td>0.17</td>
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<td>0.21</td>
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</table>

*** p < 0.001, ** p < 0.01, * p < 0.05, † p < 0.1
RSAS = Revised Social Anhedonia Scale; SWiMS = Social Withdrawal Motivation Scale (SZA = Schizoid Asociality, SUS = Suspiciousness, HOS = Hostility, SAX = Social Anxiety).

Table 7: Tests of mean difference between deficit and non-deficit schizophrenia groups on RSAS and SWiMS subscale scores

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<th>N</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
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<td>18</td>
<td>9.29</td>
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<td>15.38</td>
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<td>SWiMS-SUS</td>
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<td>Nondeficit</td>
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<td>13.62</td>
<td>3.11</td>
<td>1.5</td>
<td>0.146</td>
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<td>11.75</td>
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<td>3.64</td>
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<td>7.88</td>
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<tr>
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<td>13.95</td>
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<td>13.38</td>
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RSAS = Revised Social Anhedonia Scale; SWiMS = Social Withdrawal Motivation Scale (SZA = Schizoid Asociality, SUS = Suspiciousness, HOS = Hostility, SAX = Social Anxiety).
Table 8: Tests of difference between correlations of RSAS and SWiMS-SZA and other variables of interest

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<td>1.971</td>
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<tr>
<td>PSQ-NM</td>
<td>1.123</td>
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<tr>
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PANSS = Positive and Negative Syndrome Scale; PSQ-NM = Paranoia/Suspiciousness Questionnaire – Negative Mood/Withdrawal; TEPS = Temporal Experience of Pleasure Scale; BDI-II = Beck Depression Inventory – II; FVPS = Fenigstein & Vanable Paranoia Scale.

Table 9: Significant RSAS correlations in the full sample compared with those in the African American and Caucasian groups

<table>
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</tr>
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<td>0.297†</td>
</tr>
<tr>
<td>NM</td>
<td>0.583**</td>
</tr>
<tr>
<td>AI</td>
<td>0.461**</td>
</tr>
<tr>
<td>MW</td>
<td>0.334†</td>
</tr>
<tr>
<td>BDI-II</td>
<td>0.442*</td>
</tr>
<tr>
<td>FVPS</td>
<td>0.368*</td>
</tr>
<tr>
<td>PANSS</td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.376*</td>
</tr>
<tr>
<td>Depression</td>
<td>0.383*</td>
</tr>
<tr>
<td>Active Social Avoidance</td>
<td>0.548**</td>
</tr>
</tbody>
</table>

** p < 0.01, * p < 0.05, † p < 0.1

PSQ = Paranoia/Suspiciousness Questionnaire (IS/H = Interpersonal Suspiciousness/Hostility, NM = Negative Mood/Withdrawal, AI = Anger/Intensity, MW = Mistrust/Wariness); BDI-II = Beck Depression Inventory – II; FVPS = Fenigstein Vanable Paranoia Scale; PANSS = Positive and Negative Syndrome Scale.
Table 10: Significant correlations with individual RSAS items

<table>
<thead>
<tr>
<th>RSAS item</th>
<th>Criterion Measure</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. I sometimes become deeply attached to people I spend a lot of time with. [R]</td>
<td>PANAS-PA</td>
<td>-0.398*</td>
</tr>
<tr>
<td></td>
<td>BAS</td>
<td>-0.3499</td>
</tr>
<tr>
<td>10. People sometimes think that I am shy when I really just want to be left alone.</td>
<td>LSAS-FA</td>
<td>-0.376*</td>
</tr>
<tr>
<td>12. When someone close to me is depressed, it brings me down also. [R]</td>
<td>PSQ-MW</td>
<td>-0.411*</td>
</tr>
<tr>
<td></td>
<td>PSQ-NM</td>
<td>-0.327**</td>
</tr>
<tr>
<td></td>
<td>PSQ-PH</td>
<td>-0.0327</td>
</tr>
<tr>
<td></td>
<td>BIS</td>
<td>-0.3609</td>
</tr>
<tr>
<td></td>
<td>PANSS suspiciousness/persecution</td>
<td>-0.3559</td>
</tr>
<tr>
<td></td>
<td>PANSS hostility</td>
<td>-0.3229</td>
</tr>
<tr>
<td>31. I have often found it hard to resist talking to a good friend, even when I have other things to do. [R]</td>
<td>PANSS emotional withdrawal</td>
<td>0.3481</td>
</tr>
<tr>
<td>36. If given the choice, I would much rather be with others than alone. [R]</td>
<td>PANSS passive/apathetic social withdrawal</td>
<td>0.3581</td>
</tr>
<tr>
<td></td>
<td>TEPS-ANT</td>
<td>-0.3569</td>
</tr>
</tbody>
</table>

*** p < 0.001, ** p < 0.01, * p < 0.05, † p < 0.1

PANAS-PA = Positive and Negative Affect Scale – Positive Affect subscale; BAS = Behavioral Activation Scale; LSAS-FA = Liebowitz Social Anxiety Scale – Fear/Anxiety subscale; PSQ = Paranoia/Suspiciousness Questionnaire (MW = Mistrust/Wariness, NM = Negative Mood/Withdrawal, PH = Perceived Hardship/Resentment); BIS = Behavioral Inhibition Scale; PANSS = Positive and Negative Syndrome Scale; TEPS-ANT = Temporal Experience of Pleasure Scale – Anticipatory pleasure subscale