

ABSTRACT

Title of Thesis: THE VALIDITY AND COMPARISON OF
TWO AFFILIATION TASKS IN
SCHIZOPHRENIA

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Negative symptoms are related to worse psychosocial functioning in schizophrenia. The current study evaluates two behavioral affiliation tasks—the video-based Social Affiliation Interaction Task (SAIT) and the in-vivo Conversation Task (CT)—and explores whether behavioral ratings of social affiliation are associated with negative symptoms and community functioning. Participants, 20 with schizophrenia/schizoaffective disorder (SZ) and 35 healthy controls (HC), completed both tasks and measures of negative symptoms and functioning. SZ evidenced lower behavioral affiliation on the SAIT compared to HC. There were no group differences in behavioral affiliation on the CT. Within groups, behavioral affiliation was not correlated between tasks or with symptoms and functioning. Across groups, behavioral affiliation from the SAIT was correlated with symptoms and functioning. Post hoc analyses revealed higher ratings of positive facial expression and valence in

the CT for HC compared to SZ. Results suggest that the method of assessing behavioral affiliation may influence research findings.

THE VALIDITY AND COMPARISON OF TWO AFFILIATION TASKS IN
SCHIZOPHRENIA

by

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List of Abbreviations

SAIT—Social Affiliation Interaction Task

Conv. Task—Conversation Task

BPRS—Brief Psychiatric Rating Scale

CDSS—Calgary Depression Scale for Schizophrenia

CAINS—Clinical Assessment Interview for Negative Symptoms

MAP—Motivation and Pleasure

EXP—Expression

RFS—Role Functioning Scale

Chapter 1: Introduction

Schizophrenia is defined by the presence of positive or psychotic symptoms as well as negative symptoms (Peralta & Cuesta, 2001). Negative symptoms can be characterized as (i) reduced motivation and pleasure in social, work/school, and recreational roles and (ii) reduced expression, such as limited facial expression, speech output, and vocal intonation (Kring, Gur, Blanchard, Horan, & Reise, 2013). Negative symptoms are premorbid, enduring features of the illness that predict the development of schizophrenia-spectrum disorders (Kwapil, 1998) and continue throughout the course of illness (Palmer, Heaton, & Jeste, 1999). These unremitting symptoms also relate to worse psychosocial functioning (e.g., role functioning, interpersonal functioning) both cross-sectionally and prospectively (Ho, Nopoulos, Flaum, Arndt, & Andreasen, 1998; Hunter & Barry, 2012; Mueser, Bellack, Morrison, & Wixted, 1990). Given the functional consequences of negative symptoms, it is important to investigate the factors that are associated with their development and maintenance. The current study focuses on one such factor, social skill, and its measurement.

Social skills are behaviors that allow for a successful interaction with another person and can be categorized into four components: nonverbal (e.g., gaze), paralinguistic (e.g., clarity of speech), speech content, and balance (e.g., natural turn-taking) (Mueser & Bellack, 1998). Numerous studies have found that negative symptoms, such as social anhedonia and asociality, are related to deficits in social skills (including problem-solving and verbal and non-verbal skills), such that more severe negative symptoms are typically accompanied by worse social skills (e.g.,

Bellack, Morrison, Wixted, & Mueser, 1990; Mueser et al., 1990; Addington & Addington, 1999). However, some studies fail to replicate the relation between negative symptoms and social skills (Blanchard, Bellack, & Mueser, 1994; O'Brien et al., 2009), highlighting a need for further research examining how this relation might differ with a specific social skill (i.e., affiliation) being measured.

Social skills are also meaningfully tied to functioning in individuals with schizophrenia. Research indicates that approximately two-thirds of these individuals experience strained family interactions, never marry, and are socially isolated (Bellack et al., 2007). Adverse effects of poor social skills can be found in daily functioning as well: Poorer social problem-solving skills are associated with poorer hygiene and health and fewer job-seeking behaviors (Couture, Granholm, & Fish, 2011), whereas better social problem-solving skills are related to improved functional outcome (Brekke, Kay, Lee, & Green, 2005). Additionally, Dickinson, Bellack, and Gold (2007) found that individuals with schizophrenia who had higher scores on measures of problem-solving and conversation-starting skills were three times more likely to be categorized as having “good vocational functioning” relative to lower-scoring individuals.

Given that social skills are related to a variety of important clinical and functional outcomes in schizophrenia, researchers and clinicians should undertake a comprehensive approach to the investigation of these skills. One important consideration is the type of social skill being measured. Current research focuses on social problem-solving skills because of the link between stress and the development of schizophrenia (Butzlaff & Hooley, 1998); however, it is equally informative to

understand the process of forming close social bonds (affiliation) and how that process is disrupted in schizophrenia. Affiliation is thought of as a fundamental motivation for humans (Baumeister & Leary, 1995), and individuals who have weak or no affiliative bonds can experience declines in community, academic, and occupational functioning (Blanchard, Collins, Aghevli, Leung, & Cohen, 2011; Blanchard, Mueser, & Bellack, 1998; Kring et al., 2013). Therefore, examining affiliation in schizophrenia could inform the origin and treatment of these functional impairments and possibly provide an additional avenue for intervention.

Affiliation skills can be broadly defined as social approach skills, such as warmth and positive facial expressions, and are employed during positive social interactions (RDoC Social Processes Workshop Proceedings, February 2012). In working towards the goal of understanding and enhancing affiliation skills in individuals with schizophrenia, a key first step is the creation of appropriate measures of such skills. Over the last 30 years, researchers have developed assessments of social skills, termed role-play tests (RPTs; see Bellack, Brown, & Thomas-Lohrman, 2006). RPTs are simulated social interactions carried out in the laboratory and comprise various scenes to be acted out by the participant and the confederate: Scenes involve starting a conversation, being assertive, or solving a problem (Dickinson et al., 2007; Donahoe et al., 1990; Sayers, Bellack, Wade, Bennett, & Fong, 1993). RPTs have been valuable in understanding social skill deficits in schizophrenia, but it is difficult to measure affiliation skills with existing RPTs because most scenes focus on problem-solving skills (by introducing conflict or stress). Additionally, even in scenes where there is no overt conflict—such as those where the goal is simply for

the participant to get to know the experimenter—confederates may be instructed only to deliver conversation prompts after 10s of silence (Penn, Mueser, Spaulding, Hope, & Reed, 1995) or to maintain a neutral emotional expression (Horan & Blanchard, 2003). Participants, both with and without schizophrenia, have found these scenes to be unpleasant (i.e., decreases in positive mood after the task; Horan & Blanchard, 2003).

To address this gap in the current collection of social skills assessments, Llerena, Park, Couture, and Blanchard (2012) developed a novel measure specifically intended to capture affiliation skills: the Social Affiliation Interaction Task (SAIT). Here, participants watch a video of a warm and welcoming female describing her relationships and activities she likes to do with others, and then participants are prompted to respond with a description of their own relationships. Using the SAIT, Llerena et al. (2012) measured affiliation skills in undergraduate students who were high in social anhedonia and found that these participants exhibited poorer affiliation and overall social skills when compared to controls without social anhedonia. Recently, Park (2014) conducted an examination of the SAIT in an outpatient sample with schizophrenia and schizoaffective disorder and healthy controls. Behavioral ratings of affiliation skills differentiated patients from controls, and within the clinical sample, skills ratings were significantly correlated with clinical ratings of social anhedonia and asociality. These results are consistent with the aforementioned clinical literature (i.e., an inverse relation between social anhedonia and social skill in schizophrenia), and they serve as preliminary evidence that the SAIT is sensitive to individual differences in affiliation in both clinical and healthy samples. Although the

SAIT has notable strengths, including its standardized administration and cost-effectiveness, this assessment does have some possible weaknesses. Namely, a simulated video interaction may have poor ecological validity.

To address the limitations of existing RPTs and the SAIT, we have developed an alternative affiliation task that engages participants in a live, conflict-free conversation. Live conversation tasks are a good proxy for real-world interactions, though they do require more of research personnel and cannot be entirely standardized. The new Conversation Task differs from the SAIT in that it is a face-to-face conversation and differs from standard RPTs and other conversation tasks in that the confederate is required to behave in a positive and warm manner, naturally facilitating the conversation using pre-determined prompts.

As reviewed above, there are two recently developed approaches to assessing social affiliation in psychopathology, the video SAIT and the live Conversation Task. Although each has potential strengths, as of yet no study has examined the empirical comparability of these assessments and the potential superiority of one approach versus the other in a clinical sample. In the current study, we propose administering the SAIT and the Conversation Task to healthy controls and individuals with schizophrenia. Based on past research demonstrating that social skill ratings are significantly different across psychiatric and healthy control groups (Bellack et al., 1994; Park, 2014), we hypothesize that both tasks will accurately differentiate between healthy controls and participants with a diagnosis of schizophrenia/schizoaffective disorder. We also expect that affiliation ratings from the tasks will be significantly correlated, showing convergent validity. We will

examine the discriminant validity of each skill assessment by determining if affiliation ratings from each are independent of positive and depressive symptoms. Finally, in the examination of predictive validity, we will examine which task is more strongly related to negative symptoms and functioning in the community.

Chapter 2: Method

Participants

Twenty male outpatients with schizophrenia or schizoaffective disorder (recruited via chart review, clinician referral, and self-referral from Baltimore, MD) and 35 non-psychiatric males (recruited via fliers posted at the University of Maryland Department of Psychiatry and at the Maryland Psychiatric Research Center) participated in a parent fMRI study examining the effects of social support on stress reactivity.

Inclusion criteria were as follows: (1) male, (2) between the ages of 18-65, (3) have a schizophrenia spectrum disorder diagnosis according to the Structured Clinical Interview for DSM Disorders (SCID) IV (for the psychiatric group only), (4) be literate and fluent in English, (5) have normal hearing, (6) be willing to have assessments videotaped, (7) if on medications, have a stable regimen for at least 2 weeks (for the psychiatric group only), and (8) be right handed (for scanning purposes). Exclusion criteria for all participants were as follows: (1) magnetic resonance imaging contraindications (e.g., MR unsafe metal in the body), (2) claustrophobia, (3) history of neurological conditions, (4) exceed the weight limitations of the scanner, (5) back problems that would prevent the participant from lying on their back for up to 1.5 hours, and (6) history of substance abuse or dependence within the past 6 months. Additional exclusion criteria for controls were (1) having a known psychological condition assessed using the Structured Clinical Interview for DSM-IV diagnosis screener (e.g., depression, PTSD, and clinical anxiety because individuals with other psychiatric diagnoses may also exhibit deficits in social skills (Herbert et al., 2005; Segrin, 2000), (2) psychosis in a first- or second-

degree relative (participant self-report), and (3) taking psychoactive drugs (e.g., Zoloft, Ritalin).

Measures

Social Affiliation Interaction Task (SAIT; Llerena et al., 2012). The SAIT was adapted from experiments on mate selection and behavior (Simpson, Gangestad, & Biek, 1993; Simpson, Gangestad, Christensen, & Leck, 1999; Gangestad, Simpson, Cousins, Garver-Apgar, & Christensen, 2004) and designed to elicit affiliative social responses through a simulated social encounter. The participant watches a video (2 minutes, 43 seconds) of an outgoing and attractive female describing her social relationships and activities. At the end of the video, the female in the video asks what the participant enjoys doing with family and friends. The participant is instructed to reply as if he is actually speaking to the person in the video. See Appendix A for a transcript of the speech.

Conversation Task. In this task, the participant and experimenter have a conversation in which the goal is to get to know the other person. An experimenter (not from the SAIT) delivers a scripted introduction wherein she tells the participant that she is close with her family and friends and that she enjoys spending time with them. She then asks the participant to speak about himself. The entire conversation, including the scripted introduction, is 3.5 minutes long. The experimenter uses positive affect, body language, and self-disclosure to promote affiliation during the conversation, calling on principles of the development of trust and cooperation (Declerck, Boone, & Emonds, 2013). See Appendix B for introduction and conversation prompts.

Behavioral coding procedure. Social skills, including affiliation skills, were coded from the responding phase of the SAIT and the full Conversation Task. To avoid rater and task contamination, two undergraduate raters blind to group status, symptom ratings, and community functioning coded each task (four raters in total). The raters used a social skills rating manual and additional task-specific rating forms (adapted from the Maryland Assessment of Social Competence; Bellack et al., 1994; Sayers, Bellack, Wade, Bennett, & Fong, 1995) to code gold-standard training videos chosen from recordings of subjects in the current sample. After training, each rater coded half of the videos from each task, and interrater agreement for social skill was assessed using intra-class correlation (ICC) across subjects for each of the social skills within each task using the gold-standard codes as reference. Raters received weekly coding supervision to prevent coder drift. They coded twelve social skill components across four domains using a 5-point Likert scale ranging from 1 (Very poor) to 5 (Very good): (1) Verbal/Conversational domain, which is based on individual ratings of clarity, spontaneous conversation, positive valence, negative valence, and word count; (2) Non-verbal domain, which reflects how the participant speaks, including individual ratings of gaze/eye contact, fluency, meshing, and non-verbal bodily expression; (3) Affiliation—that is, the participant’s engagement coded as an aggregate across verbal and nonverbal behaviors (e.g., vocal affective expression, warmth); and (4) Overall Social Skill, which is a general measure of ability to interact in a meaningful way, and it includes the verbal and nonverbal domains. Both tasks were coded for the same behaviors except Meshing was not

coded for the SAIT. The current study only examined the Affiliation domain. See Appendix C for manual and coding forms for each task.

In a past study using the SAIT with undergraduates (Llerena et al., 2012), interrater reliability was measured using ICCs for each social skill domain; ICCs ranged from 0.87 to 0.93. Internal reliability, assessed with Cronbach's alpha, for the four social skills domains was 0.92, indicating good internal consistency (Llerena et al., 2012). ICCs were calculated for the current study; however, Cronbach's alpha was not calculated as there is only one item of interest on each coding form.

Currently, the Conversation Task has no published psychometric properties as it was specifically developed for this study. Previous research using unstructured role-plays found ICCs between 0.72 and 0.95 (Penn et al., 1995). ICCs were calculated for the current study.

Symptoms and functioning. The Clinical Assessment Interview for Negative Symptoms (CAINS; Kring et al., 2013) is a 13-item clinician-rated interview that assesses a range of negative symptoms representing two subscales, motivation and pleasure (MAP; 9 items) and expression (EXP; 4 items). The MAP measures desire for close relationships, frequency of pleasurable social, work/school, and recreational activities in the past week, and expected frequency of these activities in the upcoming week. The EXP measures facial and vocal expression, expressive gestures, and quantity of speech. All items are rated on a scale from 0 (No impairment) to 4 (Severe deficit). Each point on the scale is accompanied by a brief description of the meaning of that point for that particular item (e.g., for Item 1 – Motivation for Close Family/Spouse/Partner Relationships, 4 = Severe deficit: No interest in family

relationships and does not consider them at all important. Prefers to be alone and is not at all motivated to be with family. If person does see family, it is done so grudgingly, passively and with no interest.). The CAINS was chosen as the measure of negative symptoms because it was developed to improve upon psychometric and conceptual weaknesses in existing measures of negative symptoms (Blanchard, Kring, Horan, & Gur, 2011). In final validation studies, it exhibited high inter-rater agreement (ICCs of 0.93 for MAP and 0.77 for EXP), good internal consistency (Cronbach's alpha for overall scale = 0.76, MAP = 0.74, and EXP = 0.88), and good convergent and discriminant validity in schizophrenia/schizoaffective patient samples (Kring et al., 2013). See Appendix D for CAINS measure.

The Brief Psychiatric Rating Scale (BPRS; Overall & Gorham, 1962) is a 24-item interview measure designed to assess clinical symptoms experienced over the previous week and will be used to assess symptom severity. The Positive Symptoms subscale includes grandiosity, bizarre behavior, unusual thoughts, hallucinations, disorientation, suspiciousness, and conceptual disorganization. The BPRS evidences good reliability and validity and is one of the most frequently used psychiatric scales in schizophrenia samples (Kay, 1990; Shafer, 2005). See Appendix E for BPRS measure.

The Calgary Depression Scale for Schizophrenia (CDSS; Addington, Addington, & Schissel, 1990) is a 9-item scale that assesses depressive symptoms on a scale from 0 (absent) to 3 (severe). The CDSS has been found to measure the same construct in both in- and outpatients exhibit high internal consistency and high

convergent validity with other well-validated depression scales (Addington, Addington, Maticka-Tyndale, & Joyce, 1992). See Appendix F for the CDSS.

The Role Functioning Scale (RFS; Goodman, Sewell, Cooley, & Leavitt, 1993) is a 4-item clinician-rated interview that assesses functioning in work/school, independent living, close relationships, and community activities. Items are rated on a scale from 1 (minimal functioning) to 7 (optimal functioning). The RFS is frequently used in studies of schizophrenia (e.g., Horan, Pineda, Wynn, Iacoboni, & Green, 2014; Ventura et al., 2014) and has displayed good reliability (Cronbach's $\alpha = 0.92$; ICCs ranged from 0.68 to 0.82) and criterion-group and construct validity as well as good diagnostic prediction (Goodman, Sewell, Cooley, & Leavitt, 1993). See Appendix G for RFS measure.

Procedure

Data were collected over the course of two visits. During Visit 1 (3 hours), participants provided informed consent and completed a battery of scales and tasks including the CAINS, BPRS, CDSS, RFS, and SAIT. During Visit 2 (2.5 hours), participants completed scales and tasks assessing social functioning including the Conversation Task. All assessors and experimenters were blind to group status, symptom ratings, and community functioning.

Data Analysis Plan

The researchers assessed coder reliability via ICCs. We then used a *t*-test to examine differences in affiliation between control and schizophrenia groups for both the SAIT and the Conversation Task (Bellack et al., 1994). To measure convergent

validity, we calculated Pearson correlations between affiliation ratings with the SAIT and the Conversation Task in both groups. We measured discriminant validity via correlations between affiliation ratings from the SAIT and the Conversation Task with the Positive Symptom subscale of the BPRS and the CDSS. Lastly, we sought to determine whether the SAIT or the Conversation Task has a stronger relation with concurrent negative symptoms and functioning via two regression models containing negative symptoms and functioning as separate outcome variables and the SAIT and Conversation Task as joint predictors.

Chapter 3: Results

Demographic characteristics of participants are provided in Table 1. Groups did not significantly differ in age ($t(53) = -1.13, p > 0.10$) but controls were more educated than individuals with schizophrenia ($t(53) = 3.07, p < 0.01$). To examine differences on nominal demographic variables, we conducted chi-square tests of independence. Groups did not differ on race ($X^2(3, N = 55) = 1.30, p > 0.10$), marital status ($X^2(2, N = 55) = 1.51, p > 0.10$), or employment status ($X^2(1, N = 55) = 2.57, p > 0.10$); however, controls were more likely to be living unsupervised compared to individuals with schizophrenia ($X^2(2, N = 55) = 8.91, p < 0.01$).

Table 1.
Demographic Variables

	SZ (N = 20)	HC (N = 35)
Sex: Male (N)	20	35
Age (M, SD)	48.70 (11.22)	44.74 (13.22)
Education (M, SD)	10.75 (1.80)	12.65 (2.41)
Race (N)		
Black or African-American	19	32
White	1	1
Asian	-	1
Multiple Backgrounds	-	1
Marital Status (N)		
Married	0	2
Divorced/Separated	3	7
Never Married	17	26
Employment Status		
Employed	2	10
Unemployed	18	25
Living Circumstances		
Unsupervised	14	34
Supervised (e.g., half-way home)	3	1
Supervised (e.g., board and care)	3	0

Note. SAIT = Social Affiliation Interaction Task; Conv. Task = Conversation Task; RFS = Role Functioning Scale; BPRS = Brief Psychiatric Rating Scale; CAINS = Clinical Assessment Interview for Negative Symptoms; MAP = Motivation and

Pleasure Scale; EXP = Expression Scale; CDSS = Calgary Depression Scale for Schizophrenia.

Reliability

Interrater agreement for behavioral skills ratings was examined with ICCs using a two-way mixed model. ICCs between each of the two raters per task and the gold standard rater were 0.92 and 0.89 for the SAIT and 0.95 and 0.89 for the Conversation Task. These values indicate high interrater agreement between the task raters and the gold standard rater for the affiliation variables.

Group Differences in Affiliation

Behavioral ratings and clinical symptom ratings are provided in Table 2. Group differences in behavioral ratings of affiliation were assessed with independent samples *t*-tests. Analyses revealed a significant group difference in SAIT behavioral ratings of affiliation ($t(1, 44) = 3.84, p < .001, \text{Cohen's } d = 1.21$) with controls evidencing more affiliative skills than individuals with schizophrenia. However, groups did not differ in Conversation Task behavioral affiliation ratings ($t(1, 52) = 1.57, p = .12, \text{Cohen's } d = 0.43$).

Table 2.
Descriptive Statistics for Variables of Interest

	SZ	HC
SAIT: Affiliation (M, SD)	2.05 (1.03)	3.22 (1.01)
Conv. Task: Affiliation (M, SD)	3.84 (1.07)	4.23 (0.73)
RFS: Global (M, SD)	18.5 (5.25)	26.97 (1.81)
BPRS: Positive (M, SD)	12.9 (8.15)	7.06 (0.24)
CAINS: MAP (M, SD)	15.8 (9.99)	4.43 (3.99)
CAINS: EXP (M, SD)	4.9 (3.99)	0.09 (0.51)
CDSS (M, SD)	4.53 (5.26)	0.11 (0.32)

Note. SAIT = Social Affiliation Interaction Task; Conv. Task = Conversation Task; RFS = Role Functioning Scale; BPRS = Brief Psychiatric Rating Scale; CAINS = Clinical Assessment Interview for Negative Symptoms; MAP = Motivation and

Pleasure Scale; EXP = Expression Scale; CDSS = Calgary Depression Scale for Schizophrenia.

The global ratings of affiliation skill integrate several facets of social skill such as spontaneous conversation and positive valence. To more thoroughly examine affiliation skills in both groups, we conducted post hoc exploratory *t*-tests comparing individual domains of affiliation across groups. See Table 3 for details. Domains analyzed had minimum ICCs of 0.80. For the SAIT, individuals with schizophrenia had lower behavioral ratings of fluency and positive facial expression. Similarly, for the Conversation Task, individuals with schizophrenia had lower behavioral ratings of positive valence and positive facial expression. Thus, although global ratings of affiliation did not differentiate the groups on the Conversation Task, the groups did differ on the component skill ratings of positive valence and positive facial expression.

Table 3.
Group Comparisons Across Individual Domains of Affiliative Skill

	SZ	HC	
	M (SD)	M (SD)	<i>t</i> (df)
SAIT			
Spontaneous Conversation	2.95 (1.78)	3.57 (1.43)	1.32 (32.69 ^a)
Positive Valence	3.11 (1.33)	3.80 (1.16)	1.94 (44)
Negative Valence	1.95 (1.39)	1.43 (0.77)	-1.54 (25.31 ^a)
Fluency	2.56 (1.20)	3.33 (0.84)	2.61 (28.08^a)*
Nonverbal Bodily Expression	2.42 (1.02)	2.93 (0.59)	1.95 (25.94 ^a)
Positive Facial Expression	1.21 (5.34)	1.60 (0.56)	2.08 (40.67^a)*
Negative Facial Expression	1.00 (0)	1.01 (0.40)	1.36 (26 ^a)
Conversation Task			
Spontaneous Conversation	4.21 (0.92)	4.69 (0.63)	2.01 (27.47 ^a)
Positive Valence	3.16 (1.30)	3.94 (1.00)	2.29 (29.72^a)*
Nonverbal Bodily Expression	4.05 (0.85)	4.34 (0.77)	1.28 (52)
Positive Facial Expression	2.42 (1.39)	3.43 (1.20)	2.80 (52)*

Note. SAIT = Social Affiliation Interaction Task.

^aEqual variances not assumed

**p* < 0.05

Convergent and Discriminant validity

To examine convergent validity, the relation between behavioral ratings from the two social interactions was explored. The SAIT and Conversation Task affiliation ratings were not significantly correlated in the control group ($r = 0.30, p = .12$) or in the schizophrenia group ($r = 0.36, p = .14$), though in both groups effect sizes are of a moderate magnitude (Cohen, 1988). Collapsing across both groups, the SAIT and Conversation Task were significantly correlated ($r = 0.40, p = .01$).

We measured discriminant validity within and across groups via correlations between affiliation ratings from the SAIT and the Conversation Task with the Positive Symptom subscale of the BPRS and depression ratings from the CDSS (see Table 4). Similar to the pattern of findings discussed above, behavioral ratings of affiliation from the SAIT and Conversation Task were not significantly correlated with depression or positive symptoms in either group, but, in the combined sample, affiliation ratings from the SAIT were significantly correlated with positive ($r = -0.32, p < .05$) and depressive symptoms ($r = -0.40, p < .05$).

Table 4.
Correlation by Group and Task with Symptoms and Functioning.

		SAIT	BPRS: Positive	CDSS	CAINS: MAP	CAINS: EXP	RFS: Global
HC	SAIT	-	0.20	0.20	-0.09	-0.25	0.14
	Conv. Task	0.30	-0.08	-0.11	-0.18	-0.29	0.21
SZ	SAIT	-	-0.14	-0.26	-0.45	-0.32	0.35
	Conv. Task	0.36	-0.06	0.11	-0.12	0.23	0.18
All	SAIT	-	-0.32*	-0.40*	-0.53*	-0.51*	0.54*
	Conv. Task	0.40*	-0.14	-0.04	-0.24	-0.06	0.28*

Note. HC = Healthy Controls; SZ = Schizophrenia; SAIT = Social Affiliation Interaction Task; Conv. Task = Conversation Task; RFS = Role Functioning Scale; BPRS = Brief Psychiatric Rating Scale; CAINS = Clinical Assessment Interview for

Negative Symptoms; MAP = Motivation and Pleasure Scale; EXP = Expression Scale; CDSS = Calgary Depression Scale for Schizophrenia.

* $p < 0.05$

Predictive Validity

We correlated affiliation ratings from the SAIT and Conversation Task with negative symptoms and functioning; behavioral ratings of affiliation and negative symptoms were not significantly correlated in either group. Given these findings, we did not proceed with regression analyses as planned and instead conducted further correlational analyses. Collapsing across groups, the SAIT was significantly correlated with negative symptom ratings such that more severe deficits in motivation and pleasure and more severe deficits in expressivity were associated with lower behavioral skills ratings. See Table 4.

Given the significant correlations between behavioral ratings of affiliation in the SAIT and symptoms in the combined sample, we conducted partial correlations to determine if negative symptoms remained associated with behavioral affiliation after controlling for positive symptoms and depression. The correlation between ratings from the SAIT and the CAINS MAP and EXP remained significant while controlling for positive symptoms ($pr = -0.44, p < 0.01$ and $pr = -0.48, p < 0.01$ respectively) and depressive symptoms ($pr = -0.31, p < 0.01$ and $pr = -0.37, p < 0.01$ respectively) but the correlation between the SAIT and CAINS MAP became marginal when both positive and depressive symptoms were controlled for ($pr = -0.28, p = 0.06$) and the correlation with CAINS EXP decreased though remained significant ($pr = -0.40, p = 0.01$).

The relation between behavioral ratings of affiliative skill in the laboratory and global functioning in the community was examined. See Table 4. No correlations

were significant in the control or schizophrenia group. However, when combining the two groups, community functioning was significantly correlated with behavioral skill in the SAIT ($r = 0.54, p < .05$) and the Conversation Task ($r = 0.28, p < .05$). Again, we conducted partial correlations to examine the relations between affiliation and functioning independent of positive and depressive symptoms. The correlation between the SAIT and global functioning remained significant when controlling for the effect of the positive symptoms ($pr = 0.47, p < .05$), depression ($pr = 0.37, p < .05$), and both positive and depressive symptoms ($pr = 0.35, p < .05$). The correlation between the Conversation Task and global functioning remained significant after controlling for positive symptoms ($pr = 0.25, p < .05$) but became nonsignificant after controlling for depressive symptoms ($pr = 0.15, p > 0.10$) and both positive symptoms and depression ($pr = 0.06, p > 0.10$).

To determine which affiliation task accounted for more variance in community functioning, we conducted post hoc exploratory partial correlations with each task and the global score from the RFS. When controlling for the SAIT, the correlation between the Conversation Task and RFS was not significant ($pr = 0.10, p > .10$). However, when controlling for the Conversation Task, the correlation between the SAIT and RFS remained significant ($pr = 0.49, p < .01$). This finding suggests that the relation between affiliation as measured by the Conversation Task and community functioning is better accounted for by affiliation during the SAIT.

Finally, because past research has revealed significant moderate correlations between negative symptoms and community functioning (Hunter and Barry, 2012; Kring et al., 2013), we controlled for negative symptoms in the relation between

SAIT affiliation ratings and community functioning in the combined sample. The correlation became nonsignificant when controlling for CAINS MAP scores ($r = 0.23, p = .12$) but remained significant when controlling for CAINS EXP scores ($r = 0.35, p = .02$).

Chapter 4: Discussion

In the current study, we sought to better understand social affiliation skills in people with schizophrenia via two affiliation probes—a video task (Llerena et al., 2012) and an in-person dyadic interaction. Both tasks were specifically designed to elicit affiliative behavior, an important aspect of social functioning whose relations to negative symptoms of schizophrenia are unclear. The study compared behavioral performance in healthy controls and individuals with schizophrenia and incorporated assessments of symptoms and social functioning in the community.

Group Differences in Behavioral Ratings of Affiliation

Compared to controls, individuals with schizophrenia were rated as having lower affiliation skills on the video SAIT. However, there were no group differences in affiliative skill as assessed with the in-person Conversation Task. The SAIT is potentially a more demanding, and therefore more discriminating, assessment of skill compared to the Conversation Task. Differences in the tasks include how the affiliative stimulus is presented and the demands placed on the participant. In the SAIT, the participant watches the affiliation video and, when it is turned off, the participant responds as though they were having an interaction with the person in the video. This format may create particular challenges for the participant in that they must recall details of the partner who they are responding to without any ongoing cues to prompt their responses. In the Conversation Task, the response requirements are quite different as the participant interacts with an affiliative partner throughout the task. This provides ongoing social cues and prompts throughout the Conversation Task. The nature of the confederates' interaction style may also compensate for

behavioral skills deficits in participants. The Conversation Task involves confederates who are trained to be affiliative throughout the conversation (e.g., positive facial expressions and tone, displays of interest in getting to know the participant). Thus, the constant and dynamic affiliative behavior during the Conversation Task increases the likelihood that participants will reciprocate this behavior. It should be noted that the high level of affiliative behavior produced by the confederates during the task likely does not represent the level of affiliative behavior produced by conversation partners in daily life. It is possible that the format of the SAIT may result in social behavior that is more representative of individual differences in affiliation while the Conversation Task's provision of cues and affiliative prompts may create an interaction that is less sensitive to such differences. Future studies might provide the SAIT stimulus throughout the participant's response to control for any effect of stimulus duration across tasks.

Speculatively, the non-interactive nature of the SAIT may lead to increased cognitive burden on the participant. Some research has revealed emotional memory maintenance deficits in individuals with schizophrenia. For example, individuals with schizophrenia have evidenced difficulty recognizing positively valenced images after a 24-hour delay (Herbener, Rosen, Khine, and Sweeney, 2007) as well as difficulty maintaining emotional intensity over a period of 3 seconds (Gard et al., 2011). Though this literature is mixed (see Horan, Green, Kring, and Nuechterlein, 2006), emotional memory deficits might play a role in decreasing affiliative behavior during the SAIT if participants cannot remember the partner's question ("What do you like to do with your friends and family?"), her affect, her positive behavior, or other

salient stimuli. Future research could examine emotional memory during the SAIT and Conversation Task to investigate whether positive responses to the confederate are maintained across the participant's response.

Another possible explanation for lower affiliation behavior in the SAIT may be increased cognitive load. Individuals with schizophrenia may have difficulty engaging in complex affiliative behavior while simultaneously attempting to maintain the aforementioned task-relevant stimuli (e.g., Cattapan-Ludewig et al., 2005). Although a counter-argument may posit that the cognitive load in the Conversation Task is also high as participants track perceptual and social stimuli for 3m 30s, the affiliative partners are present throughout the task, and therefore, responses to the partners can be based on real-time observations instead of on cognitive representations.

A closer examination of the component parts of our global affiliation measures revealed that individuals with schizophrenia had lower behavioral ratings of fluency and positive facial expression in the SAIT and lower ratings of positive valence and positive facial expression in the Conversation Task compared to controls. Thus, global ratings of affiliation may mask important group differences in social behavior, in particular in positively valenced expressions (both verbal and facial). Future research should continue to explore the component facets of affiliation to determine whether certain facets account for more variance in affiliation. Given that these post hoc analyses were uncorrected, caution is warranted in the interpretation of the results.

Task Relations with Symptoms and Functioning

Regarding convergent validity, the SAIT and the Conversation Task were not significantly correlated within each group, though they were correlated in the total sample. Given that the correlation is significant in the total sample, the null finding may be driven by small sample and low power. However, even in the combined sample, the two tasks only share approximately 12% variance. This finding is consistent with the above discussion that these tasks have unique demands and may have differential sensitivity to participant characteristics.

Discriminant validity for each task was established within groups such that neither positive symptoms nor depression were related to behavioral ratings of affiliation. However, in the total sample, positive symptoms and depression were related to ratings from the SAIT but not to the Conversation Task. Similarly, Blanchard, Park, Catalano, and Bennett (2015) found that skill ratings from the SAIT were related to depression (though they did not observe a correlation with positive symptoms). Depression in other patient samples has been shown to adversely affect social skill. Thoma, Schmidt, Juckel, Norra, and Suchan (2015) found impaired social problem-solving skills in a sample of individuals with Major Depressive Disorder compared to healthy controls, and other researchers have observed poorer social skills in individuals with depression (for reviews, see Segrin, 2000; Tse and Bond, 2004). Given these findings, researchers should continue to measure depression and negative symptoms when assessing level of affiliation skill in individuals with schizophrenia as both symptom constellations seem to affect affiliation skill.

Affiliation skills and negative symptoms were not related in either group, though they were related in the total sample such that more affiliation skills in the SAIT were related to less severity in negative symptoms of motivation and pleasure as well as expression. When controlling for depressive symptoms, the relation between the affiliation skills in the SAIT and negative symptoms of motivation and pleasure was no longer significant, suggesting that depression, affiliation skills on the SAIT, and motivation and pleasure are strongly linked in some meaningful way. Future studies should continue to explore how these constructs overlap in individuals with schizophrenia. Controlling for depression did not change the relation between affiliation on the SAIT and negative symptoms of expression, and this suggests that deficits in facial, vocal, spoken, and bodily expression may not be strongly related to depressive symptoms. Future research should measure depression when assessing affiliation skills given these findings. Even in the combined sample, negative symptoms were not correlated with skills in the Conversation Task. Given that most research has revealed a relation between negative symptoms and social skills (Bellack et al., 1990; Blanchard et al., 2015; Couture et al., 2011; Mueser et al., 1990), it is intriguing that social skills measured by the Conversation Task do not seem to be related to negative symptoms. As noted previously, the format of the Conversation Task may decrease its sensitivity to individual differences (e.g., differences in symptom severity). More research should be conducted to explore the nature of the skills in this task and how they are related to the psychopathology observed in schizophrenia. Specifically, researchers should examine how individual affiliation skills might be related to negative symptoms of motivation and pleasure. Moreover, if

the Conversation Task were to be conducted with a friend or family member chosen by the participant, affiliation skills may be different and may correspond differently to negative symptoms.

Functioning in the community was not significantly related to behavioral ratings of affiliation from either task in either group; however, within the combined sample, both tasks were significantly related to community functioning. When we controlled for the combined effects of positive and depressive symptoms, the correlation between community functioning and affiliation in the SAIT remained. This implies that the specific affiliation skills measured by the SAIT are uniquely related to community functioning beyond other forms of symptomatology. Controlling for the effects of depressive and positive symptoms reduced the correlation between functioning and affiliation from the Conversation Task to nonsignificance. Because affiliation during the Conversation Task was not correlated with positive or depressive symptoms, this finding might suggest that community functioning and depressive or positive symptoms are strongly related beyond the affiliation skills from the Conversation Task.

When controlling for affiliation during the Conversation Task, the relation between affiliation during the SAIT and functioning remained significant; however, the relation between affiliation during the Conversation Task and functioning was no longer significant after controlling for affiliation on the SAIT. These findings support previous research showing that better affiliation skills are related to better functioning in the community (Brekke et al., 2005; Couture et al., 2011; Dickinson et al., 2007). However, more pertinent for the current study, the findings also indicate that the more

difficult and discriminative nature of the SAIT makes the task more sensitive to this relation with functioning in the community. Specifically, the unique skills that are assessed by the SAIT seem to be distinctively related to functioning when compared to the skills being assessed with the Conversation Task.

We found that the relation between affiliation skills in the SAIT and functioning became nonsignificant when controlling for negative symptoms of motivation and pleasure. In the current sample, the negative symptoms of motivation and pleasure were moderately correlated with SAIT affiliation skills as well as with functioning ($r = -0.81, p < .001$). Additionally, when controlling for negative symptoms of expression, the relation between affiliation skills in the SAIT and community functioning remained significant. All of these findings indicate that negative symptoms related to social motivation and pleasure (not expression) may account for the observed relation between affiliation skills and functioning. The magnitude of this partial correlation is not zero; therefore, the nonsignificant effect may also be due to low power. Researchers should examine this relation in a larger sample size.

The current study indicates that a brief sample of social affiliation in the laboratory is associated with functioning in the community. Research should continue to explore how social affiliation skills are related to community functioning, perhaps looking more closely at the various domains of functioning, in the schizophrenia population.

Summary, Limitations, and Future Directions

Our results indicate that the SAIT, a more difficult task, has stronger relations with symptomatology compared to the Conversation Task in the overall sample. This finding is in line with previous literature that has found an association between poor social skills and negative symptomatology (Bellack et al., 1990; Blanchard et al., 2015; Couture et al., 2011; Mueser et al., 1990) and functioning (Bellack et al., 2007; Brekke et al., 2005; Couture et al., 2011; Dickinson et al., 2007). It may be that the more difficult and discriminative nature of the SAIT drives the relation to symptoms. Thus, future research must consider the type of affiliation measure used as this affects the presentation of skills.

To our knowledge, this is the first study to evaluate affiliation skills using two unstructured social skills tasks: The first task employs an affiliative video and the second task uses a live affiliative social interaction to measure affiliation skills. Perhaps the skills utilized in such a task differ fundamentally from those used in a simulated interaction. The SAIT may depend more heavily upon internal motivation to interact and affiliate than the Conversation Task. If this is true, motivational deficits may drive the association between the SAIT and negative symptoms. This finding may clarify the constellation of factors that are related to lower social motivation and functioning in this group. Researchers have demonstrated that individuals with schizophrenia enjoy positively valenced stimuli (Cohen and Minor, 2010) and social interactions (Gard et al., 2014) in the moment, but set less social goals in their daily lives (Gard et al., 2011). Social motivation deficits may underlie negative symptoms, social functioning, and social affiliation skills.

One of the goals of the current study was to improve upon the ecological validity of available social skills measures. The SAIT displayed sensitivity to differences in symptomatology and functioning, however, the task still tells us little about the nature of affiliative social interactions in a more natural setting. Gard et al. (2014) found that individuals with schizophrenia actually engage in a similar number of social activities when compared to healthy controls and that they enjoy these activities as much as controls do. It is unclear which, if any, affiliation skills are present during these interactions and how affiliation skills affect enjoyment and anticipation of such interactions. Future research should examine affiliation in day-to-day interactions to explore how affiliative behaviors change across contexts and time.

Though we have presented several potentially important observations about social affiliation skills in schizophrenia, there are several limitations to acknowledge. First, the sample size is small and thus power to detect significant effects is low. Relatedly, exploratory analyses are uncorrected and should be interpreted with caution; all effects require replication before firm conclusions can be made. The order of the tasks could not be counterbalanced and may have affected performance on one or both tasks. Finally, the generalizability of the current findings is limited by several factors. Our participants are all male and most are African-American; thus, these results cannot be applied to females or other races without further research (Häfner, 2003). The average age in the patient sample also reduces generalizability to younger individuals with schizophrenia in an earlier phase of the illness. Relatedly, our confederates were all young, white, and female, and these demographic differences may have affected participants' responses during the affiliation tasks. Though

demographic differences were not controlled for in the current study, future studies might consider examining how race, gender, and age affect affiliative behaviors.

The current study was the first to examine social affiliation skills in a simulated interaction and an in vivo paradigm and found that individuals with schizophrenia exhibited comparable affiliation skills during a live social interaction but poorer skills during a simulated interaction compared to individuals without schizophrenia. Future research should continue to explore the role of social affiliation skills in daily social functioning, social goal-setting behavior, and the presentation of symptoms. Though individuals with schizophrenia have consistently reported social anhedonia and evidenced poor social skills, building research supports intact enjoyment of social interactions and other positive stimuli (Cohen and Minor, 2010; Gard et al., 2014). Researchers should investigate how social affiliation skills affect goal-setting behavior and enjoyment. Future studies might also explore the role of cognitive deficits in social affiliation behavior. Though not tested in the current study, neurocognitive deficits might have contributed to poor social affiliation during the SAIT.

Appendices

Appendix A: SAIT Confederate Speech Transcript

Hi, I'm Whitney. I have been asked to talk about what I like to do in my free time with other people, so here goes. Well, first of all, I have a really close group of friends that I like to hang out with, and we usually just, you know, watch T.V. together or, I don't know, just joke around with each other, stuff like that. Um, I really like, we really like, just like, you know, doing as much as we can together. We'll go, I don't know, run errands together, get a bite to eat, and sometimes we'll go to the basketball and football games together, which is a lot of fun. And um, my friends sometimes joke that I should list one of my hobbies as texting because I really just like to know what all my friends are up to all the time, so um, hmm. What I like most about my friends is probably just that they're always there for me. Like if I'm having a bad day or, I don't know, anything bad, I just will come talk to them, and they just always know what to say to make me feel better, so they're really important to me. It's just great having someone that I can talk to when I need to. Um, now that I'm thinking about it, I guess I just like being around people in general. Um, I really like meeting new people, and I think it's interesting to, you know, hear about all their different experiences, and I think there's a lot to learn from other people. So, yeah.

Um, oh, I also like to spend time with my family. Um, we don't always get along, but um, you know, I miss having them around. I miss my mom's cooking a lot, actually. And um, I don't know, they just, they've always been really supportive of me, so um, I don't know, I really love them, and um. My brother especially has been

super supportive. He's just always there for me, giving me advice, and he always knows what to say to make me laugh.

Um, so, um, other things I like to do... I guess really just the usual stuff like, you know, going to the movies or watching sports. You know, things like that. Um, I just, I don't know, I just like to be around people and do all those usual things, so I guess those are the things that I like to do with my friends and family, so now it's your turn. What do you like to do with your friends and family?

Appendix B: Conversation Task

Instructions:

Goal

Throughout the conversation, the confederate interacts with positive affect, positive body language, and self-disclosure to promote social affiliation with the participant. This task incorporates principles that contribute to the development of trust and cooperation.

Duration

Confederates should aim to speak approximately 50% of the time; however, they may continue using prompts and introduce new points to maintain the conversation for 3.5 minutes to increase meshing and minimize long pauses in the conversation.

Order/prompts

The order in which the points below are introduced should be guided by the natural course of the conversation, and confederates may use any of the suggested prompts, open-ended questions, and additional background information to find common interests and facilitate an affiliative conversation with the participant.

Affiliative Cues

Confederates should act and appear positive, using nonverbal cues like smiling, nodding, laughing (when appropriate), and verbal reflections that convey interest in and empathy for participant generated content (e.g., “That’s great!” or “That’s so interesting!”) to build social affiliation.

Start task:

The researcher tells the participant and confederate: “Now you will have a chance to get to know each other in a conversation that will last three and a half minutes. You can ask each other questions and talk about things like your background, what is important to you, and what you like to do in your free time with other people. Do you have any questions? [*Confederate,*] why don’t you start?”

Introduction:

Confederate: Hi, I’m (*confederate name*). I grew up in Ellicott City, Maryland with my parents and sister. I’m pretty close with my family, and I enjoy spending time with them. My friends are also a big part of my life. We like to hang out together to cook dinner, watch TV, and check out the free museums in DC. And we always have each other’s back. Just this past weekend, my friend wasn’t feeling well so I brought her some soup to help her feel better. My friends mean the world to me [or ‘are important to me’], and I really like being there for people when they need a hand. Anyway, why don’t you tell me a little about yourself?

Background:

- **Prompts:**

- Where are you from?
- What was it like growing up in “X town”?
- Where are you living now?
- How do you like living in “X town”?
- What do you like most about living in “X town”?
- **Background Information:**
 - If asked, say you went to Centennial High School

Family:

- **Prompts:**
 - What is your family like?
 - Are you close with your family?
 - Do you have any siblings?
 - What types of things do you like to do with your family?”
- **Background Information:**
 - We like to make dinner together and have game nights that are really fun
 - My family is really supportive, and I like that we can always talk about anything with each other
 - Even though we have our ups and downs sometimes, I know that my family is always there for me, and I try to be there for them

Friends:

- **Prompts:**
 - What do you like to do in your free time?
 - Are most of your friends from where you live now or where you grew up?
 - That’s interesting; could you tell me more about that?
 - What is your favorite thing to do on the weekends?
- **Background Information:**
 - I study psychology here at the University of Maryland (if asked: I’m interested in how people get along with each other)
 - I have made some pretty close friends at school, and we like to hang out, watch tv, movies, and go for walks
 - Sometimes we will go to someone’s house to make dinner or play board games
 - I also keep in touch with my friends from home; I call them to see how they’re doing
 - I like spending time with people in general, and I really enjoy meeting new people, too

End Task:

The researcher times the conversation and enters the room to end the task after **3.5 minutes**.

Appendix C: Social Skills Manual

SOCIAL AFFILIATION ROLE-PLAY RATING MANUAL

This manual is based on the social skills rating manual used in a study being conducted at the Maryland Psychiatric Research Center (“Oxytocin or Galantamine Versus Placebo for the Treatment of Negative Symptoms and Cognitive Impairments in Schizophrenia (CIDAR-3)”) and in Llerena et al., 2012.

Behavioral interaction tasks may be coded using the following domains; however, not all domains will be coded in each task.

VERBAL/CONVERSATIONAL CONTENT

CLARITY

Clarity refers to the extent to which the participant expresses himself clearly and directly. This category reflects the clarity of the *content* being expressed, not the form. It may help for the rater to ask him/herself, “Do I understand what the participant is talking about?” Do not code speech impediments, slurred speech, or any other pronunciation/enunciation features. If there are form issues, the rater might ask him/herself, “If the speech were not slurred, garbled, etc., would I understand the meaning of the sentences clearly?”

A high rating is given if the rater can easily understand the participant’s thoughts and ideas because they are expressed directly and clearly. The rater does not need to make assumptions to understand the participant because there is no ambiguity in the participant’s statements. The participant’s statements follow the course of the conversation in logical succession.

A low rating for clarity is given if the rater is unsure of what the participant is trying to say because it is vague or indirect and the participant does not explain further. The rater needs to make many assumptions in order to understand what the participant is trying to convey. The participant’s statements are illogical given the context of the conversation.

Clarity is coded on a scale from 1 (*very poor*) to 5 (*very good*).

SPONTANEOUS CONVERSATION

This rating refers to the amount of dialogue that is initiated and controlled by the participant and not directly in response to answering specific questions from the participant. When there is no confederate present, this item measures all speech produced as well as how long the participant chooses to speak.

A high rating of spontaneous conversation is given if the participant generates conversation without cues from the confederate, asks the confederate questions that

further the conversation, or spontaneously provides content that facilitates the social interaction. For example, the confederate asks, “What kinds of movies do you like?” and the participant responds, “I like comedies like ‘Dumb and Dumber,’ but I’m pretty open to action and drama. What kinds of movies do you like?” This response would receive a high rating because it answers the question, includes additional information, and poses another question to the confederate. If there is no confederate present, a high rating would be given if the participant generates a great deal of speech that is relevant to the goal of the task.

A low rating of spontaneous conversation is given if the participant simply answers questions asked by the confederate with little or no additional information and without initiating conversation topics. For example, the confederate asks “What kinds of movies do you like?” and the participant responds, “Comedies.” This response would reflect a low rating of spontaneous conversation because the participant offers no more information. If there is no confederate present, a low rating would be given if the participant generates very little speech or only speech that is not relevant to the task (e.g., sings the ABCs).

Spontaneous conversation is coded on a scale from 1 (*very poor*) to 5 (*very good*).

POSITIVE VALENCE

Positive valence entails language (not facial expressions) that expresses positive affect, such as appreciation or happiness. The focus of this rating is to capture positive feelings, opinions, or perceptions of the participant. For example, the participant may say “*I like* watching TV,” “*I really enjoy* Italian food,” “Doughnuts are *good*,” “That’s a *nice* thing to do,” etc. Note that positive language coded in this category is italicized in the previous examples. Raters may code lists of enjoyable things as long as the participant does not become derailed while listing. For example, the following would not be coded as positive valence: “I like to play cards, dance, but some reason we get into other discussions, and also going out.” Do not code language in which the participant is acquiescing to a question the confederate asks. For example, if the confederate asks “Do you like Italian food?” and the participant responds, “Yes,” this would not be coded as an expression of positive affect.

Positive valence is coded on a scale from 1 (*very low*) to 5 (*very high*).

NEGATIVE VALENCE

Negative valence entails language (not facial expressions) that expresses negative affect, such as sadness, annoyance, anger, hostility, criticism, anxiety, or distress. The focus of this rating is to capture negative feelings, opinions, perceptions, judgments, or experiences of the participant. For example, the participant may say, “I don’t usually feel like doing anything,” “I don’t like anything about this neighborhood,” “Chewing gum is disgusting,” “I feel really uncomfortable in large groups,” etc. Do not code language in which the participant is acquiescing to a

question the confederate asks. For example, if the confederate asks, “Do you like your neighbors?” and the participant responds “No,” this would not be coded as an expression of negative affect.

Negative valence is coded on a scale from 1 (*very low*) to 5 (*very high*).

WORD COUNT

Record the total number of words used by the participant throughout the role-play. Slang and contractions count as words; “mhm” and “uh” do not count as words. This rating excludes words regarding confusion about the task. Use the transcripts to code this item.

NONVERBAL CONTENT

GAZE / EYE CONTACT

This is a measure of the frequency, duration, and appropriateness of gaze or eye contact during the task. Remember that most people do not make constant eye contact—gaze should not be fixed, as in a stare. During the Whitney task, gaze should be directed towards the camera.

A high rating of gaze/eye contact is given if the gaze is appropriate in frequency and duration. Natural gaze patterns involve periodic shifts in focus to and away from the partner’s face or from the camera. It is fairly typical for individuals to look slightly away while thinking or talking as long as they make eye contact when they are listening to the other person talk. Thus, looking away occasionally may be appropriate, particularly if they are not looking very far away.

A low rating of gaze/eye contact is given if the participant stares at the confederate’s body, frequently looks back and forth between the confederate’s face and the floor, looks at the ceiling, ground, or wall, etc.

Eye contact/gaze is rated on a scale from 1 (*very poor*) to 5 (*very good*).

FLUENCY

This item should be used to assess the smoothness of the participant’s speech. Code stuttering, pauses, fillers such as “um” or “ah,” or speech that is interrupted or choppy. The majority of people engage in these behaviors to some extent, and so they may be difficult to rate. When rating fluency, pay attention to how these behaviors *impact the conversation*. It may be difficult to determine whether a pause reflects difficulty articulating or an attempt to encourage the confederate to speak. As a general rule, if the pause seems appropriate, do not consider that while making your rating. Focus exclusively on the speech of the participant and not the interaction

between the confederate and participant. Do not code difficulties related to form of speech (slurring, garbling, mumbling, lisp, etc.).

A high rating of fluency is given if speech that is well articulated, continuous, and facile. For example, the following pause would be considered appropriate: “I really like watching all kinds of sports. I’m pretty excited about football season. ...(Pause)... Do you like any sports?”

A low rating of fluency is given if there are excessive amounts of pauses, stuttering, repetitions, and interruptions that negatively impact the conversation. For example, the following pause would be considered to negatively impact fluency: “I really like watching all kinds of sports, and I’m pretty excited about ...(Pause)... football season.”

Fluency is measured on a scale from 1 (*very poor*) to 5 (*very good*).

MESHING

Use this item to rate the smoothness of turn taking during the conversation or how smoothly the individuals respond to one another. This can be thought of broadly as the flow of the conversation as it is affected by the participant. While rating this item, keep in mind that the focus is on the flow *between* the partners, and note the effects of the participant’s pauses or interruptions on the overall fluency of the conversation. Do not code how the confederate’s behaviors affect meshing.

A high rating of meshing is given if the participant does not interrupt the confederate and if each person is participating equally.

A low rating of meshing includes interrupting the other person, making long pauses before responding to questions, going on an extensive monologue, or pauses due to terminal answers from the participant. For example, if the participant goes on a long-winded monologue and does not give the confederate a chance to speak, they would receive a low rating for meshing. Additionally, if the participant simply answers the confederate’s questions with “yes” or “not really,” they would receive a low rating for meshing.

Meshing is rated on a scale from 1 (*very poor*) to 5 (*very good*).

NONVERBAL BODILY EXPRESSION

This category includes aspects of nonverbal bodily communication (including gestures and postures) that are relevant to and/or expand upon communication. Pay attention to the participant's gestures, seated position, and whether he orients his body towards the confederate.

A high rating for this item includes leaning forward occasionally, making expressive hand gestures, nodding, tilting the head, or displaying other postures or gestures that convey interest and involvement during the social interaction. The participant may convey relaxed nonverbal postures (e.g., relaxed and open position with legs and arms uncrossed).

A middle rating may be applied if the participant is oriented towards the confederate but does not nod his head, lean in, or use expressive gestures.

A low rating is given if the participant remains still and immobile, sits with arms and legs tightly crossed and chin down, or fully supporting his head with his hand or slouches forward.

Nonverbal bodily expression is rated on a scale from 1 (*very poor*) to 5 (*very good*).

NONVERBAL FACIAL EXPRESSION – POSITIVE VALENCE

This category captures positive nonverbal facial expression. Pay attention to the participant's general facial expressions that may express positive emotions such as happiness, delight, calmness, amusement, pleasure, satisfaction, excitement, etc. Code only expressions that are directly linked to positive valence. Do not code small changes in individual facial muscles such as facial tics; instead, attend to changes in groups of muscles.

A high rating is given if the participant smiles, grins, laughs, or displays other positive facial expressions often, for extended periods of time, and with high intensity.

A low rating is given if the participant displays no positive facial expressions or few positive facial expressions that are fleeting and low intensity.

Nonverbal facial expression – positive valence is rated on a scale from 1 (*very low*) to 5 (*very high*).

NONVERBAL FACIAL EXPRESSION – NEGATIVE VALENCE

This category captures negative nonverbal facial expression. Pay attention to the participant's general facial expressions that may express negative emotions such as annoyance, anxiety, hostility, misery, distress, gloom, etc. Code only expressions that are directly linked to negative valence. Do not code small changes in individual facial muscles such as facial tics; instead, attend to changes in groups of muscles.

A high rating is given if the participant grimaces, frowns, furrows his brows, or displays other negative facial expressions often, for extended periods of time, and with high intensity.

A low rating is given if the participant displays no negative facial expressions or few negative facial expressions that are fleeting and low intensity.

Nonverbal facial expression – negative valence is rated on a scale from 1 (*very low*) to 5 (*very high*).

OVERALL AFFILIATION

This is an integrative category (includes previous categories) that reflects the participant's engagement in the interaction and the extent to which personal ties are established through verbal and nonverbal exchange. Note that a participant may be high in affiliation yet have poor social skills. When rating this, think of how friendly the participant comes across.

A high rating of affiliation is given if the participant displays behaviors that reflect a warm, engaging temperament towards the confederate, such as asking questions, offering spontaneous conversation, and demonstrating appropriate positive affective facial and vocal expression. The participant displays subjective feelings and attitudes that reflect trust, openness, and intimacy (e.g., expressing positive feelings about family, friends, or towards the confederate and her comments). For example, if the confederate states that she enjoys doing certain things, a participant high in affiliation might express reciprocity by saying, "I really like to do that too." A person may display flat affect but still show affiliative behaviors.

A low rating of affiliation is given if the participant discourages continuation of the interaction (e.g., lack of voice inflection, saying very little, giving curt responses) and/or manifests no behaviors that would facilitate social contact (e.g., doesn't nod, has poor eye contact, doesn't ask questions). The person seems cold, distant, or aloof and may engage in behaviors that discourage interaction.

Affiliation is rated on a scale from 1 (*very low*) to 5 (*very high*).

OVERALL SOCIAL SKILL

This is an integrative category (includes previous categories *except* affiliation) that measures the participant's social competence and their ability to interact in a meaningful way while achieving the goal of the task, which is to get to know the other person in the Conversation Task and to answer Whitney's question ("What do you like to do with friends and family?") in the Whitney Task. Note that a participant may have high social skill yet not affiliate with the confederate. Rate this item last for each participant.

A high rating of social skill may be given if the participant engages in the conversation with logical speech, displays appropriate nonverbal expression, and smoothly interacts with the confederate. He or she seems to be comfortable or confident in the situation. Facial and vocal valence may be appropriate.

A low rating of social skill may be given if the participant pauses often, interrupts the confederate, is difficult to follow, or displays inappropriate nonverbal expression. A participant with poor social skills may display odd posturing and seem uncomfortable in the situation. Facial and vocal valence may be inappropriate.

Social skill is rated on a scale from 1 (*very low*) to 5 (*very high*).

SOCIAL SKILLS CODING FORM – SOCIAL AFFILIATION INTERACTION TASK

Date _____ Participant ID _____ Rater ID _____ Start (m:s): _____
 _____ End (m:s): _____

VERBAL/CONVERSATIONAL CONTENT

Clarity – extent to which the participant expresses himself clearly and directly

1	2	3	4	5
<i>Very poor; Participant is barely understandable; responses are vague, indirect and/or illogical</i>	<i>Poor</i>	<i>Average; Content is understood; Some responses may not be exceptionally clear</i>	<i>Good</i>	<i>Very good: Content is easily understood; responses are direct and logical</i>

Spontaneous Conversation - amount of dialogue that is initiated and controlled by the participant

1	2	3	4	5
<i>Very poor; Offers virtually no spontaneous conversation to facilitate interaction</i>	<i>Poor</i>	<i>Average; Offers some spontaneous conversation</i>	<i>Good:</i>	<i>Very good; Exceptionally provides spontaneous content that facilitates interaction</i>

Positive Valence - verbal expression of positive content

1	2	3	4	5
<i>Very low; virtually no positive content/affect; no positive tone</i>	<i>Low</i>	<i>Average; some positive content/affect; may expound on positive topics and/or use positive tone</i>	<i>High</i>	<i>Very high; great deal of positive content/affect; may provide many details and/or use positive tone frequently</i>

Negative Valence - verbal expression of negative content

1	2	3	4	5
<i>Very low; virtually no negative</i>	<i>Low</i>	<i>Average; some negative content/affect;</i>	<i>High</i>	<i>Very high; great deal of negative content/affect;</i>

content/affect; no negative tone

may expound on negative topics and/or use negative tone

may provide many details and/or use negative tone frequently

Word Count: _____

NONVERBAL CONTENT

Gaze/eye contact – frequency, duration, and appropriateness of gaze or eye contact

1	2	3	4	5
<i>Very poor; Completely avoids eye contact or glares at the partner</i>	<i>Poor</i>	<i>Average; Eye contact is apparent but not strong</i>	<i>Good</i>	<i>Very good; Eye contact appears very natural and is appropriate in duration</i>

Fluency - smoothness of verbal speech

1	2	3	4	5
<i>Very poor; Numerous pauses and fillers negatively impact the conversation</i>	<i>Poor</i>	<i>Average; Pauses and fillers are noticeable and interfere slightly</i>	<i>Good</i>	<i>Very good; Pauses or fillers are not noticeable and do not interfere</i>

Nonverbal Bodily Expression – extent to which participant's body language that expands communication and displays interest/engagement

1	2	3	4	5
<i>Very poor; Participant's posture is stiff or clearly conveys disinterest/disengagement</i>	<i>Poor</i>	<i>Average; Oriented towards confederate; Some body language displaying interest/engagement</i>	<i>Good</i>	<i>Very good; Participant orients towards confederate, nods, leans forward, and clearly conveys interest/engagement</i>

Nonverbal Facial Expression – Positive Valence - positive facial expression

1	2	3	4	5
<i>Very low; virtually no</i>	<i>Low</i>	<i>Average; some positive facial</i>	<i>High</i>	<i>Very high; positive facial</i>

positive facial expressions

expressions with moderate duration and intensity

expressions occur often with high duration and intensity

Nonverbal Facial Expression – Negative Valence - negative facial expression

1
Very low; virtually no negative facial expressions

2
Low

3
Average; some negative facial expressions with moderate duration and intensity

4
High

5
Very high; negative facial expressions occur often with high duration and intensity

OVERALL AFFILIATION

Affiliation – extent to which the participant is involved and engaged in the interaction

1
Very low; Participant seems cold and distant; he does not facilitate the conversation

2
Low

3
Average; Participant shows some appreciation of confederate but doesn't facilitate conversation

4
High

5
Very High: The participant is engaged and shows great appreciation of the confederate

OVERALL SOCIAL SKILL

Overall Social Skill – participant's social competence and ability to interact in a smooth, meaningful way

1
Very low; Participant seems uncomfortable or distant and does not interact smoothly

2
Low

3
Average; Participant makes some effort to facilitate conversation, though still engages in poor nonverbal expression

4
High

5
Very high; Participant interacts smoothly and appropriately

SOCIAL SKILLS CODING FORM – CONVERSATION TASK

Date _____ Participant ID _____ Rater ID _____ Start (m:s): _____
 _____ End (m:s): _____

VERBAL/CONVERSATIONAL CONTENT

Clarity – extent to which the participant expresses himself clearly and directly

1 <i>Very poor; Participant is barely understandable; responses are vague, indirect and/or illogical</i>	2 <i>Poor</i>	3 <i>Average; Content is understood; Some responses may not be exceptionally clear</i>	4 <i>Good</i>	5 <i>Very good: Content is easily understood; responses are direct and logical</i>
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Spontaneous Conversation - amount of dialogue that is initiated and controlled by the participant

1 <i>Very poor; offers virtually no spontaneous conversation to facilitate interaction</i>	2 <i>Poor</i>	3 <i>Average; offers some spontaneous conversation</i>	4 <i>Good:</i>	5 <i>Very good; exceptionally provides spontaneous content that facilitates interaction</i>
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Positive Valence - verbal expression of positive content

1 <i>Very low; virtually no positive content/affect; no positive tone</i>	2 <i>Low</i>	3 <i>Average; some positive content/affect; may expound on positive topics and/or use positive tone</i>	4 <i>High</i>	5 <i>Very high; great deal of positive content/affect; may provide many details and/or use positive tone frequently</i>
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Negative Valence - verbal expression of negative content

1 <i>Very low; virtually no negative</i>	2 <i>Low</i>	3 <i>Average; some negative content/affect;</i>	4 <i>High</i>	5 <i>Very high; great deal of negative content/affect;</i>
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*content/affect; no
negative tone*

*may expound on
negative topics
and/or use
negative tone*

*may provide
many details
and/or use
negative tone
frequently*

Word Count: _____

NONVERBAL CONTENT

Gaze/eye contact – frequency, duration, and appropriateness of gaze or eye contact

1	2	3	4	5
<i>Very poor; Completely avoids eye contact or glares at the partner</i>	<i>Poor</i>	<i>Average; Eye contact is apparent but not strong</i>	<i>Good</i>	<i>Very good; Eye contact appears very natural and is appropriate in duration</i>

Fluency - smoothness of verbal speech

1	2	3	4	5
<i>Very poor; Numerous pauses and fillers negatively impact the conversation</i>	<i>Poor</i>	<i>Average; Pauses and fillers are noticeable and interfere slightly</i>	<i>Good</i>	<i>Very good; Pauses or fillers are not noticeable and do not interfere</i>

Meshing - the smoothness of turn taking during the conversation

1	2	3	4	5
<i>Very poor; The participant interrupts, does not respond, or speaks too much</i>	<i>Poor</i>	<i>Average; The participant interrupts sometimes or may go off on a tangent with some negative impact on the conversation</i>	<i>Good</i>	<i>Very good; There are no interruptions; conversation is equally distributed and exceptionally smooth</i>

Nonverbal Bodily Expression – extent to which participant's body language that expands communication and displays interest

1	2	3	4	5
<i>Very poor; Participant's posture is stiff or clearly conveys disinterest</i>	<i>Poor</i>	<i>Average; Oriented towards confederate; Some body language displaying interest/engagement</i>	<i>Good</i>	<i>Very good; Participant orients towards confederate, nods, leans forward, and clearly conveys interest</i>

Nonverbal Facial Expression – Positive Valence - positive facial expression

1	2	3	4	5
<i>Very low; virtually no positive facial expressions; few facial expressions with low duration and intensity</i>	<i>Low</i>	<i>Average; some positive facial expressions with moderate duration and intensity</i>	<i>High</i>	<i>Very high; positive facial expressions occur often with high duration and intensity</i>

Nonverbal Facial Expression – Negative Valence - negative facial expression

1	2	3	4	5
<i>Very low; virtually no negative facial expressions; few facial expressions with low duration and intensity</i>	<i>Low</i>	<i>Average; some negative facial expressions with moderate duration and intensity</i>	<i>High</i>	<i>Very high; negative facial expressions occur often with high duration and intensity</i>

OVERALL AFFILIATION

Affiliation – extent to which the participant is involved and engaged in the interaction

1	2	3	4	5
<i>Very low; Participant seems cold and distant; he does not facilitate the conversation</i>	<i>Low</i>	<i>Average; Participant shows some appreciation of confederate but doesn't facilitate conversation</i>	<i>High</i>	<i>Very High: The participant is engaged and shows great appreciation of the confederate</i>

OVERALL SOCIAL SKILL

Overall Social Skill – participant’s social competence and ability to interact in a smooth, meaningful way

1	2	3	4	5
<i>Very low; Participant seems uncomfortable or distant and does not interact smoothly</i>	<i>Low</i>	<i>Average; Participant makes some effort to facilitate conversation, though still engages in poor nonverbal expression</i>	<i>High</i>	<i>Very high; Participant interacts smoothly and appropriately</i>

Appendix D: Clinical Assessment Interview for Negative Symptoms v1.0

Overall Introduction: *In this interview, I'll be asking you some questions about things you have been doing over the past week. In the first section, I am going to ask you some questions about your family, romantic partners, and friends, including how motivated you have been to spend time with them and how you felt when you were around them.*

I. SOCIAL (MOTIVATION & ENJOYMENT)

Ratings are based on two domains: □A) Family relationships □B) Friendships □The item ratings are based on reports of the person's experiences, including the degree to which the person values and desires close social bonds and is motivated to seek out and sustain interactions with other people, and observable behaviors, namely, the extent to which the person initiates, actively engages in, and persists in interactions with others.

Item 1 Rating -- Family

0 = No impairment: VERY INTERESTED in and highly values close family bonds as one of the most important parts of life. Strongly desires and is highly motivated to be in contact with family. Regularly initiates and persists in interactions with family and actively engages in these interactions; good and bad times are openly discussed. Well within normal limits.

1 = Mild deficit: GENERALLY INTERESTED in and values close family bonds though response suggests some minor or questionable reduction. Generally desires and is motivated to maintain contact with family. Has a close relationship with family member(s) in which good and bad times can be discussed. Mild deficit in initiating and persisting in regular interactions with family – generally actively engaged when interactions occur.

2 = Moderate deficit: SOMEWHAT INTERESTED in family relationships and considers them somewhat important. May occasionally miss close connections with family but is only somewhat motivated to seek out interaction with family. Notable deficit in initiating and persistently engaging in interactions; discussion of good and bad times is limited. Interactions with family members may occur but are largely superficial and participation is best characterized as “going through the motions”; interactions are more likely initiated by family with mostly passive involvement of the person. □

3 = Moderately severe deficit: □LITTLE INTEREST in family relationships (could “take it or leave it”) and does not describe family bonds as important. Describes hardly any motivation and minimal effort to have close family relationships. Rarely has discussion of good and bad times with family members. Contact and engagement with family is superficial and passive with almost all initiation and efforts to engage coming from others.

4 = Severe deficit: NO INTEREST in family relationships and does not consider them at all important. Prefers to be alone and is not at all motivated to be with family. If person does see family, it is done so grudgingly, passively and with no interest. **9 = Not rated:** □All relatives are deceased or dangerous, or person is raised in highly

unstable conditions outside of a family context (e.g., frequently shifting to different foster homes or facilities) (Note: this rating should be used only in rare circumstances)

ITEM 2 Rating– Friendships

0 = No impairment: VERY INTERESTED in and highly values friendships as one of the most important parts of life. Strongly desires and is very motivated to engage in friendships. Regularly initiates and persists in interactions with friends and actively engages in these interactions; good and bad times are openly discussed. Well within normal limits.

1 = Mild deficit: GENERALLY INTERESTED in and values friendships though response suggests some minor or questionable reduction. Generally desires and is motivated to engage in friendships. Has friendships in which good and bad times can be discussed though this may be less consistent. Mild deficit in initiating or persistently engaging during interactions with friends. If no friends, misses friendships, is motivated to have friends, and makes efforts to seek out friends.

2 = Moderate deficit: SOMEWHAT INTERESTED in friendships and considers them somewhat important. May occasionally miss close connections with friends and is somewhat motivated to have friends. Notable deficit in initiating and persistently engaging in interactions; discussion of good and bad times is limited. Interactions with friends may occur but are largely superficial and participation is best characterized as “going through the motions”; interactions are initiated by others with mostly passive involvement of the person. If no friends, is only somewhat motivated to have friends and rarely if ever seeks out friends.

3 = Moderately severe deficit: LITTLE INTEREST in friendships (could “take it or leave it”) and does not describe friends as important. Describes hardly any motivation to have friendships, and would just as soon be alone. Contact and engagement with friends is superficial and passive with almost all initiation and efforts to engage coming from others.

4 = Severe deficit: NO INTEREST in friendships and does not consider them at all important. Prefers to be alone and is not at all motivated to have friends.

Item 3 Rating – Frequency of pleasurable social activities

0 = No impairment: Pleasure experienced daily.

1 = Mild deficit: Pleasure experienced 5 - 6 days.

2 = Moderate deficit: Pleasure experienced 3 - 4 days.

3 = Moderately severe deficit: Pleasure experienced 1 - 2 days.

4 = Severe deficit: No pleasure reported.

ITEM 4 Rating – Frequency of expected pleasurable social activities

0 = No impairment: Expecting 7 or more pleasurable experiences.

1 = Mild deficit: Expecting enjoyment from 5-6 pleasurable experiences.

2 = Moderate deficit: Expecting enjoyment from 3-4 pleasurable experiences.

3 = Moderately severe deficit: Expecting 1-2 pleasurable experiences.

4 = Severe deficit: Expecting NO pleasurable experiences.

II. VOCATIONAL (MOTIVATION AND ENJOYMENT)

The item ratings are based on reports of internal experiences, including the degree to which the person values and desires vocational activities and is motivated to seek out and sustain these activities, and observable behaviors, namely, the extent to which the person initiates, actively engages in, and persists in vocational activities. Roles considered in this category include paid employment, volunteer work, caregiver for another person (not own children), or vocational rehabilitation-related activities.

Introduction: Now I am going to ask you some questions about work and school, including how motivated you have been for work or school activities and how you felt while doing these things over the past week. □ The item ratings are based on reports of internal experiences, including the degree to which the person values and desires productive work or school activities and is motivated to seek out and sustain these activities, and observable behaviors, namely, the extent to which the person initiates, actively engages in, and persists in work or school activities.

ITEM 5 Rating – Motivation for Work/vocational/school activities □

0 = No impairment: □ Person is VERY MOTIVATED to seek out work or school, or new opportunities in work or school; initiates and persists in work, school, or job-seeking on a regular basis, well within normal limits. □

1 = Mild deficit: □ Person is GENERALLY MOTIVATED to seek out work or school or new opportunities in work or school; a mild deficit in initiating and persisting; may report instances of initiating, but with moderate persistence. □

2 = Moderate deficit: □ Person is SOMEWHAT MOTIVATED to seek out work or school or new opportunities in work or school; notable deficit in initiating; may have initiated activities, but needed reminders on multiple occasions, and/or not initiated any new activities, and/or not persisted for very long.

3 = Moderately severe deficit: Person is only SLIGHTLY MOTIVATED to seek out work or school or new opportunities in work or school; significant deficit in initiating; may have needed constant reminders, and/or initiated a few activities; did not persist for very long.

4 = Severe deficit: Person is NOT AT ALL MOTIVATED to seek out work / school; nearly total lack of initiation and persistence in work, school, or job seeking. □ **9 =**

Not rated: □ Person has been in the hospital, or has been on vacation/break from vocational role during the prior week.

ITEM 6 Rating – Frequency of expected pleasurable vocational activities

0 = No impairment: Expecting 7 or more pleasurable experiences. □

1 = Mild deficit: Expecting enjoyment from 5-6 pleasurable experiences. □

2 = Moderate deficit: Expecting enjoyment from 3-4 pleasurable experiences.

3 = Moderately severe deficit: Expecting 1-2 pleasurable experiences.

4 = Severe deficit: Expecting NO pleasurable experiences. □

9 = Not rated: Will be on vacation/break from regular vocational role the following week.

III.RECREATION (MOTIVATION & ENJOYMENT)

The item ratings are based on reports of internal experiences, including the degree to which the person values and desires recreational activities and is motivated to seek out and sustain these activities, and observable behaviors, namely, the extent to which the person initiates, actively engages in, and persists in recreational activities.

Introduction: *In the next section, I am going to ask you some questions about what you do in your free time – any hobbies or recreational activities. I will ask about your motivation and feelings about the things that you have done in your free time over the past week.*

ITEM 7 Rating – Hobbies/recreation/pastimes

0 = No impairment: Person is VERY MOTIVATED to seek out hobbies and recreational activities; initiates and persists in hobbies and recreational activities on a regular basis, well within normal limits.

1 = Mild deficit: Person is GENERALLY MOTIVATED to seek out hobbies and recreational activities; a mild deficit in initiating and persisting; may report initiating hobbies, but with moderate persistence.

2= Moderate deficit: Person is SOMEWHAT MOTIVATED to seek out hobbies and recreational activities; notable deficit in initiating; may have initiated some activities and/or not persisted for very long. Others were somewhat more likely to initiate hobbies or activities.

3 = Moderately severe deficit: Person is only SLIGHTLY MOTIVATED to seek out hobbies and recreational activities; significant deficit in initiating and persisting; may have initiated a few activities and not persisted for very long. Others were much more likely to initiate hobbies or prompt initiation.

4 = Severe deficit: Person is NOT AT ALL MOTIVATED to seek out hobbies and recreational activities; nearly total lack of initiation and persistence in hobbies or recreational activities

ITEM 8 Rating– Frequency of pleasurable recreation past week

0 = No impairment: At least A FEW different types of pleasurable experiences, experienced daily.

1 = Mild deficit: At least A FEW different types of pleasurable experiences, experienced more days than not.

2 = Moderate deficit: 1 or 2 different types of pleasurable experiences, experienced more days than not.

3= Moderately severe deficit: 1 type of pleasurable experience, experienced on just a few days.

4 = Severe deficit: No pleasurable experiences.

ITEM 9 Rating – Frequency of expected pleasurable recreational activities

- 0 = No impairment:** Expecting 7 or more pleasurable experiences. □
- 1 = Mild deficit:** Expecting enjoyment from 5-6 pleasurable experiences. □
- 2 = Moderate deficit:** Expecting enjoyment from 3-4 pleasurable experiences.
- 3 = Moderately severe deficit:** Expecting 1-2 pleasurable experiences.
- 4 = Severe deficit:** Expecting NO pleasurable experiences.

IV EXPRESSION

Note: all ratings are based on observations of behavior throughout the interview and responses to the specific emotional probe questions in this section. Be sure to ask questions that elicit BOTH positive and negative emotion. If the person does not respond to the prompts asking about emotional experiences, items can be rated based on the responses to other questions during the interview. At the end of the subscale, note the basis for the ratings.

ITEM 10 Rating – Facial Expression □

0 = No impairment: □ WITHIN NORMAL LIMITS; frequent expressions throughout the interview. □

1 = Mild deficit: □ MILD DECREASE in the frequency of facial expressions, with limited facial expressions during a few parts of the interview.

2 = Moderate deficit: □ NOTABLE DECREASE in the frequency of facial expressions, with diminished facial expressions during several parts of the interview.

3 = Moderately severe deficit: □ SIGNIFICANT LACK of facial expressions, with only a few changes in facial expression throughout most of the interview.

4 = Severe deficit: NEARLY TOTAL LACK of facial expressions throughout the interview.

Item 11 Rating – Vocal Expression □

0 = No impairment: □ WITHIN NORMAL LIMITS. Normal variation in vocal intonation across interview. Speech is expressive and animated. □

1 = Mild deficit: □ MILD DECREASE in vocal intonation. Variation in intonation occurs with a limited intonation during a few parts of the interview. □

2 = Moderate deficit: □ NOTABLE DECREASE in vocal intonation. Diminished intonation during several parts of the interview. Much of speech is lacking variability in intonation but prosodic changes occur in several parts of the interview. □

3 = Moderately severe deficit: □ SIGNIFICANT LACK of vocal intonation with only a few changes in intonation throughout most of the interview. Most of speech is flat and lacking variability, only isolated instance of prosodic change □

4 = Severe deficit: □ NEARLY TOTAL LACK OF change in vocal intonation with characteristic flat or monotone speech throughout the interview.

ITEM 12 Rating – Expressive Gestures □

0 = No impairment: □ WITHIN NORMAL LIMITS; uses frequent gestures of the interview. □

1 = Mild deficit: □ MILD DECREASE in the frequency of expressive gestures, with limited gestures in a few parts of the interview. □

2 = Moderate deficit: □ NOTABLE DECREASE in the frequency expressive gestures, with lack of gestures during several parts of the interview. □

3 = Moderately severe deficit: □ SIGNIFICANT LACK of expressive gestures, with only a few gestures throughout most of the interview. □

4 = Severe deficit: □ NEARLY TOTAL LACK of expressive gestures.

ITEM 13 Rating – Quantity of Speech □

0 = No impairment: □ NORMAL AMOUNT of speech throughout the interview. Replies provide sufficient information with frequent spontaneous elaboration. □

1 = Mild deficit: □ MILD DECREASE in the quantity of speech, with brief responses during a few parts of the interview.

2 = Moderate deficit: NOTABLE DECREASE in speech output, with brief responses during several parts of the interview. □

3 = Moderately severe deficit: □ SIGNIFICANT LACK of speech, with very brief answers (only several words) in responses throughout most of the interview.

4 = Severe deficit: All or nearly all replies are one or two words throughout the entire interview.

Appendix E: Brief Psychiatric Rating Scale

Rate items 1-14 on the basis of patient's self-report. Note items 7, 12, and 13 are also rated on the basis of observed behavior. Items 15-24 are rated on the basis of observed behavior and speech. Provide examples.

1. Somatic Concern
2. Anxiety
3. Depression
4. Suicidality
5. Guilt
6. Hostility
7. Elevated Mood
8. Grandiosity
9. Suspiciousness
10. Hallucinations
11. Unusual Thought Content
12. Bizarre Behavior
13. Self-Neglect
14. Disorientation
15. Conceptual Disorganization
16. Blunted Affect
17. Emotional Withdrawal
18. Motor Retardation
19. Tension
20. Uncooperativeness
21. Excitement
22. Distractibility
23. Motor Hyperactivity
24. Mannerisms and Posturing

NA	1	2	3	4	5	6	7
Not Assessed	Not Present	Very Mild	Mild	Moderate	Moderately Severe	Severe	Extremely Severe

Sources of information (choose all applicable):

- Patient Parents/Relatives
- Mental health professionals Chart
- Other (e.g., police report)

Explain here if validity of assessment is questionable:

- Symptoms possibly substance-induced
- Under reported due to lack of rapport
- Patient uncooperative
- Difficult to assess due to formal thought disorder
- Other

Confidence in assessment

1 = not at all - 5 = very confident

Appendix F: Calgary Depression Scale for Schizophrenia

Interviewer: Ask the first question as written. Use follow-up probes or qualifiers at your discretion. Time frame refers to last week unless stipulated. The last item, #9, is based on observations of the entire interview.

1. DEPRESSION: How would you describe your mood over the last two weeks? Do you keep reasonably cheerful or have you been very depressed or low spirited recently? In the last two weeks how often have you (own words) every day? All day?

0 Absent

1 Mild - Expresses some sadness or discouragement on questioning.

2 Moderate - Distinct depressed mood persisting up to half the time over last 2 weeks: present daily.

3 Severe - Markedly depressed mood persisting daily over half the time interfering with normal motor and social functioning.

2. HOPELESSNESS: How do you see the future for yourself? Can you see any future? - or has life seemed quite hopeless? Have you given up or does there still seem some reason for trying?

0 Absent

1 Mild - Has at times felt hopeless over the past two weeks but still has some degree of hope for the future.

2 Moderate - Persistent, moderate sense of hopelessness over last week. Can be persuaded to acknowledge the possibility of things being better.

3 Severe - Persisting and distressing sense of hopelessness

3. SELF DEPRECIATION: What is your opinion of your self compared to other people? Do you feel better, not as good, or about the same as others? Do you feel inferior or even worthless?

0 Absent

1 Mild - Some inferiority; not amounting to feeling of worthlessness.

2 Moderate - Subject feels worthless, but less than 50% of the time.

3 Severe - Subject feels worthless more than 50% of the time. May be challenged to acknowledge otherwise.

4. GUILTY IDEAS OF REFERENCE: Do you have the feeling that you are being blamed for something or even wrongly accused? What about? (Do not include justifiable blame or accusation. Exclude delusions of guilt.)

0 Absent

1 Mild - Subject feels blamed but not accused less than 50% of the time.

2 Moderate - Persisting sense of being blamed, and/or occasional sense of being accused.

3 Severe - Persistent sense of being accused. When challenged, acknowledges that it is not so.

5. PATHOLOGICAL GUILT: Do you tend to blame yourself for little things you may have done in the past? Do you think that you deserve to be so concerned about this?

0 Absent

1 Mild - Subject sometimes feels over guilty about some minor peccadillo, but less than 50% of the time.

2 Moderate - Subject usually (over 50% of the time) feels guilty about past actions the significance of which s/he exaggerates.

3 Severe - Subject usually feels s/he is to blame for everything that has gone wrong, even when not his/her fault.

6. MORNING DEPRESSION: When you have felt depressed over the last 2 weeks have you noticed the depression being worse at any particular time of day?

0 Absent

1 Mild - Depression present but no diurnal variation.

2 Moderate - Depression spontaneously mentioned to be worse in a.m.

3 Severe - Depression markedly worse in a.m., with impaired functioning which improves in p.m.

7. EARLY WAKENING: Do you wake earlier in the morning than is normal for you? How many times a week does this happen?

0 Absent – No early wakening

1 Mild - Occasionally wakes (up to twice weekly) 1 hour or more before normal time to wake or alarm time.

2 Moderate - Often wakes early (up to five times weekly) 1 hour or more before normal time to wake or alarm.

3 Severe - Daily wakes 1 hour or more before normal time.

8. SUICIDE: Have you felt that life wasn't worth living? Did you ever feel like ending it all? What did you think you might do? Did you actually try?

0 Absent

1 Mild - Frequent thoughts of being better off dead, or occasional thoughts of suicide.

2 Moderate - Deliberately considered suicide with a plan, but made no attempt.

3 Severe - Suicidal attempt apparently designed to end in death (i.e. accidental discovery or inefficient means).

9. OBSERVED DEPRESSION: Based on interviewer's observations during the entire interview. The question "do you feel like crying?" used at appropriate points in the interview, may elicit information useful to this observation.

0 Absent

1 Mild - Subject appears sad and mournful even during parts of the interview, involving affectively neutral discussion.

2 Moderate - Subject appears sad and mournful throughout the interview, with gloomy monotonous voice and is tearful or close to tears at times.

3 Severe - Subject chokes on distressing topics, frequently sighs deeply or cries openly, or is persistently in a state of frozen misery if the examiner is sure that this is

Appendix G: Role Functioning Scale

I want to ask you some questions about your functioning in four main areas: work/school, independent living, close social relationships, and involvement in community activities. For all of these areas, please describe how you have been functioning **over the last two weeks**.

Note: the following questions/prompts are suggested to assist with making ratings in each of these domains on a 7-point scale. Not all questions need to be asked; some may not be necessary or applicable to certain people. Also, feel free to follow-up on responses as appropriate in order to make the most accurate ratings possible.

Working Productivity - Rate the client primarily in the most appropriate expected role (i.e. homemaker, student, wage earner)

- 1 - Productivity severely limited; often unable to work or adapt to school or homemaking; virtually no skills or attempts to be productive.
- 2 - Occasional attempts at productivity unsuccessful; productive only with constant supervision in sheltered work, home or special classes.
- 3 - Limited productivity; often with restricted skills/abilities independent employment (e.g. requires highly structured routine).
- 4 - Marginal productivity (e.g. productive in sheltered work or minimally productive in independent work; fluctuates at home, in school; frequent job changes).
- 5 - Moderately functional in independent employment, at home or in school. (Consider very spotty work history or fluctuations in home, in school with extended periods of success).
- 6 - Adequate functioning in independent employment, home or school; often not applying all available skills/abilities. 7 - Optimally performs homemaking, school tasks or employment related functions with ease and efficiency.

Independent Living, Self Care - (Management of household, eating, sleeping, hygiene care)

- 1 - Lacking self-care skills approaching life endangering threat; often involves multiple and lengthy hospital services; not physically able to participate in running a household.
- 2 - Marked limitations in self-care/independent living; often involving

constant supervision in or out of protective environment (e.g. frequent utilization of crisis services).

- 3 - Limited self-care/independent living skills; often relying on limited participation in running household.
 - 4 - Marginally self sufficient, often uses REGULAR assistance to maintain self-care/independent functioning; minimally participates in running household.
 - 5 - Moderately self sufficient; i.e. living independently with ROUTINE assistance (e.g. home visits by nurses, other helping persons, in private or self-help residences).
 - 6 - Adequate independent living and self-care with MINIMAL support (e.g. some transportation, shopping assistance with neighbors, friends, other helping persons).
- Optimal care of health/hygiene; independently manages to meet personal needs and household tasks.

Family Network Relationships - (Family)

- 1 - Severely deviant behaviors within family network (i.e. often with imminent physical aggression or abuse to others or severely withdrawn from spouse, family; often rejected by family network). No contact with any family.
- 2 - Marked limitations in immediate interpersonal relationships (e.g. excessive dependency or destructive destructive communication or behaviors). Very limited contact, or contacts dominated by non-reciprocity.
- 3 - Limited interpersonally; often no significant participation/ communication with family network.
Very limited contact (less than once a month) with one or more family members, with some reciprocity.
- 4 - Marginal functioning with family network (i.e. relationships are often minimal and fluctuates in quality).
Limited contact (once a month), and it is fairly equally varied in its reciprocity.
- 5 - Moderately affective continuing and close relationships with at least one other family member.
Consistent (more than once a month) and reciprocal with at least one family member.
- 6 - Adequate personal relationship with one or more immediate member of family network.
Consistent and reciprocal with more than one family member.

7 - Positive relationships with spouse or family; assertively contributes to these relationships.

Consistent and reciprocal with several family members.

Immediate Social Network Relationships - (close friends, spouse)

1 - Severely deviant behaviors within immediate social networks (i.e. often with imminent physical aggression or abuse to others or severely withdrawn from close friends; often rejected by immediate social network). No friends.

2 - Marked limitations in friendships (e.g. excessive dependency or destructive communication or behaviors).

Only friends are mental health workers, agency staff, roommates, workmates, or classmates, or friendships are marked by dependency, non-reciprocity, friction or avoidance.

3 - Limited interpersonally; often no significant participation/ communication with friends.

Has friends, but with limited interaction, e.g. 1 contact a month.

4 - Marginal functioning with friend network (i.e. relationships are often minimal and fluctuates in quality).

Has friends, but with variable quality, reciprocity, and adequacy.

5 - Moderately affective continuing and close relationship with at least one other friend.

Has at least one good friend, with reciprocity and a good deal of contact, e.g. more than twice a month.

6 - Adequate personal relationship with one or more immediate member of social network, i.e. close friend(s)

7 - Positive relationships with friends; assertively contributes to these relationships.

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