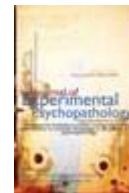




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Are Social Skill and Empathy Separable Constructs? A Psychometric Evaluation of a New Role-play Assessment of Empathy for Individuals with Schizophrenia

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Abstract

The present study evaluated the psychometric properties of a role-play measure of empathy, the Performance of Empathic Expression Rating Scale (PEERS), in a sample of 60 individuals with schizophrenia and 51 healthy controls. The role-play ratings assess a person's ability to interact empathically with a confederate in an emotionally charged situation. The PEERS demonstrated acceptable internal consistency and inter-rater reliability. Construct validity was assessed through analyses of variance to examine differences between patients and controls. Patients performed significantly worse than controls, but most of these differences were explained by social skill ability. Convergent validity analyses indicated that the PEERS is related to some aspects of a self-report measure of empathy and a theory of mind task. The PEERS also demonstrated acceptable discriminant validity. Implications for the future use of this measure will be discussed.

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Keywords: schizophrenia, social cognition, empathy, psychometrics, role-play

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Table of Contents

Introduction

Method

Participants

Development of the PEERS

Rating and Anchors

Social Cognition Measures

Theory of mind

Empathy

Symptoms

Functional Measures (schizophrenia sample only)

Social and role functioning

Cognition

Procedure

Results

Preliminary Analyses

Hypothesis Testing

Reliability Analyses

Validity Analyses

Post Hoc Analyses

Discussion

Acknowledgements

References

Appendix 1. Administration of the PEERS

Introduction

Empathy is commonly defined as the capacity to understand and experience the emotions of others (Montag, Heinz, Kunz, & Gallinat, 2007). It is an important component of social interactions, allowing individuals to connect with others and form social bonds. The ability to understand and express empathy is fundamental to successful social interactions; incorrectly appraising emotionally charged situations can lead to substantial misunderstandings and may thus undermine the possibility for significant and meaningful relationships (Lysaker, Hasson-Ohayon, Kravetz, Kent, & Roe, 2012). Empathic deficits may be useful treatment targets due to their relationship to social competence and social attainment (Smith et al., 2013).

Empathy comprises two components – emotional (or affective) empathy and cognitive empathy (Davis, 1983; Decety & Jackson, 2004). Emotional empathy involves an individual perceiving the emotions of another and subsequently experiencing similar emotions and/or physiological responses himself (Preston & De Waal, 2002). Cognitive empathy is the process by which an individual uses information from multiple sources to infer what another person is thinking or feeling (Zaki & Ochsner, 2011) and is closely related to theory of mind, or the ability to accurately judge another person's state of mind. Cognitive empathy incorporates affective states into the judgment of what the other person is thinking (Hein & Singer, 2010). Separately, sympathy exists when one understands another's emotions, but does not share in those emotions (e.g., feeling pity for someone that is sad). Empathy also includes the mimicry of others' emotional states and body language (de Waal, 2008).

Empathy deficits in people with schizophrenia have been demonstrated in several studies - when compared to healthy control participants, people with schizophrenia show deficits in overall empathy (Bora, Gökçen, & Veznedaroglu, 2008; Sparks, McDonald, Lino, O'Donnell, & Green, 2010) as well as in cognitive empathy (Derntl et al., 2009; Fujiwara et al., 2008; Montag et al., 2007). A majority of these studies utilized self-report measures such as the Interpersonal Reactivity Index (IRI; Davis, 1983) and the Empathy Quotient (EQ; Baron-Cohen & Wheelwright, 2004) to measure these empathic deficits. However, Derntl et al. (2009) argue that the utility of self-report measures to assess empathy is limited, as they might not address actual empathic abilities used in real-life situations.

Individuals with schizophrenia also experience significant deficits in insight, which includes awareness of one's illness as well as the symptoms and social consequences of the illness (Amador & David, 1998). Because of this, individuals with schizophrenia inaccurately interpret their own mental state (Frith, 2004) and incorrectly assess their own empathic abilities (Lee, Zaki, Harvey, Ochsner, & Green, 2011). This calls into question the accuracy and reliability of the information obtained from self-report measures of empathy.

Some behavioral and performance-based instruments have examined the components that comprise empathy, such as affective perspective taking. Derntl et al. (2009) developed an affective perspective-taking task that presents participants with photos of two individuals interacting, and asks them to infer the emotion of one of them (the face is masked) based on what they observe in the scene. However, this only measures cognitive empathy, and not the entire construct. Similarly, Smith et al. (2013) utilized a performance-based assessment of empathy comprising three separate tasks: facial affect perception, affective responsiveness (emotional empathy), and emotional perspective taking (cognitive empathy). While more comprehensive than stand-alone tasks, they still do not provide an overall assessment of a person's capacity for empathy in a real-life setting.

The foregoing indicates that there is a dearth of "real-world" performance based measures of empathy for use in schizophrenia research. One such methodology that can address these issues is role-play tasks, which are commonly used to assess social skill in schizophrenia (Bellack, Brown, & Thomas-Lohrman, 2006). For example, The Maryland Assessment of Social Competence (MASC; Bellack, Sayers, Mueser, & Bennett, 1994) was determined to be a psychometrically sound assessment by the NIMH-MATRICES, and was recommended as a co-primary measure of cognition in future clinical trials. Zahn-Waxler, Radke-Yarrow, Wagner, and Chapman (1992) developed a behavioral assessment of empathy in children using a putative empathy-eliciting situation and coding the child's prosocial behavior and empathic concern. Though this instrument engages participants in a real-life situation, it was created within a developmental framework, and is thus not appropriate for use in a schizophrenia population. Thus, though it has yet to be explored, role-plays may prove useful in assessing empathy among individuals with schizophrenia.

The present study evaluated the psychometric characteristics of a new role-play based measure of empathic ability in people with schizophrenia, the Performance of Empathic Expression Rating Scale (PEERS). First, this study evaluated the internal consistency and the inter-rater reliability of the measure. Second, the performance of non-clinical controls and individuals with schizophrenia on the PEERS was compared to evaluate construct validity. Third, the convergent validity of the scale was examined via the relationship between the PEERS, a self-report measure of empathy, and measures of theory of mind. Fourth, discriminant validity was evaluated by examining the relationship between cognitive ability and the PEERS. Finally, ecological validity was explored via the relationship of the PEERS with a measure of social functioning.

Method

Participants

Sixty individuals meeting DSM-IV criteria for either schizophrenia or schizoaffective disorder were recruited from several community mental health facilities in the Raleigh-Durham-Chapel Hill, NC region. Trained interviewers reviewed participants' medical charts and confirmed diagnoses by administering the Structured Clinical Interview for DSM-IV Patient Edition (SCID-P; First, Spitzer, Gibbon, & Williams, 1996).

All participants in the schizophrenia group were enrolled in a 12-week randomized trial evaluating the effect of intranasal oxytocin on symptoms and functioning in individuals with schizophrenia spectrum disorders. UNC Chapel Hill's institutional review board (IRB) approved the study. All data presented in this paper are from the baseline phase of the clinical trial, prior to the administration of the study drug. In order to be eligible for the larger oxytocin trial, individuals were required to demonstrate deficits in social cognition; please refer to the primary paper (Jarskog et al., 2017) for further details on inclusion criteria for this study. Participants were required to be currently taking antipsychotic medication, and to have been stable on their current dosage for at least one month. Ten individuals were excluded from the larger oxytocin trial for not meeting inclusion criteria (2 for history of manic episode, 2 for

substance use disorder, 2 for lack of deficit in social cognitive abilities, 2 for cognitive impairment, and 2 for noncompliance with their current psychiatric medications).

A non-psychiatric control (NPC) group consisting of 53 English-speaking individuals from the Raleigh-Durham-Chapel Hill area was recruited separately using mass emails and Internet postings asking individuals to participate in a study about “social cognition and behavior.” Participants were paid \$15 per hour for their participation plus \$5 for transportation costs, and the study visit usually lasted approximately 75-90 minutes. UNC Chapel Hill’s IRB separately approved the recruitment of control subjects. All NPCs were between the ages of 18 and 65 years old, had no known psychiatric history by self-report, and had no first-degree relatives with a psychotic disorder, bipolar disorder, or autism. Participants were matched on age and gender. Two individuals were excluded from the primary analyses based on their scores on the AQ and the SWSS (see below); thus, 51 individuals were included in the analyses.

Development of the PEERS

The PEERS is a role-play based assessment of social skill and empathy in outpatients with schizophrenia. Participants are asked to engage in two 90-second video taped role-plays with a confederate; the first scene involves general social skills, and the second focuses specifically on a situation that requires empathic responding. Raters code the role-plays on a number of aspects of the interaction.

The PEERS is based on the Social Skills Performance Assessment (SSPA; Patterson et al., 2001), a role-play measure of social functioning. The SSPA was in turn based on a role-play assessment developed by Bellack, Morrison, Wixted, and Mueser (1990) that aimed to assess general social skills. The authors of the SSPA shortened Bellack’s task from 4 role-plays to two, and modified some of the scoring. In developing the PEERS, these scenes were used but were shortened from 3 minutes to 90 seconds, and two new scenarios were created for the second scene to specifically address empathy. In this study, all participants completed Set A, where he or she must get to know a new neighbor (Scene 1) and comfort a friend who did not get a job (Scene 2).

Rating and Anchors

Both scenes are rated on eleven items assessing general social skill (i.e., Content, Clarity, Fluency, Meshing, Gaze, Involvement, Asks Questions, Appropriate Affect, Flat Affect, Social Anxiety, Overall Social Skill). These items are grouped into three subscales: Verbal (Content, Clarity, Fluency, Asks Questions), Nonverbal (Gaze, Involvement, Meshing, Appropriate Affect, Flat Affect), and Global (Social Anxiety, Overall Social Skill). Previous social skill role-plays have combined variables into similar subscales (Bellack et al., 1990; Pinkham, Penn, Perkins, Graham, & Siegel, 2007).

For the second scene only, five additional items are rated: Emotional Empathy, Cognitive Empathy, Ideomotoric Empathy (the extent to which the participant’s body language matches the confederates), Helpfulness, and Overall Empathy.

Social Cognition Measures

Theory of mind

The Theory of Mind Picture Stories task (Brune, 2003) employs six sets of 4 cards that illustrate in cartoon form a story between two or more characters. Participants are asked to put the cards in the order in which they believe the story occurred, and are asked questions about the story that address first- and second-order false beliefs, what is actually happening in the story, and what are the intentions of the characters in the story. Scoring is based on correctly ordering the cards and answers to the questions.

The Reading the Mind Through the Eyes task (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001) measures the ability of participants to identify the mental state of others based only on photos of sets of eyes that are expressing a particular emotion. Participants view 36 photos of only the eye region of different faces and are asked to choose

which of four words best describes the thought/feeling that is being portrayed. Performance is indexed as total number correct.

Empathy

The Interpersonal Reactivity Index (IRI; Davis, 1983) is a self-report measure of both cognitive and emotional empathy. It consists of 28 items; participants rate how well each item describes them using a five-point scale (1 to 5, higher is better). The 28 items yield four subscales: perspective taking (the tendency to take another's point of view), empathic concern (feelings of sympathy and concern for others), fantasy (the ability to imagine oneself in the role of a fictitious character), and personal distress (feelings of anxiety and apprehension in interpersonal settings).

Symptoms

Schizophrenia symptoms were assessed using the Positive and Negative Syndrome Scale (PANSS; Kay, Fiszbein, & Opler, 1987), a 30-item scale that are rated on a scale of 1 (absent) to 7 (severe), and are grouped into three subscales: Positive Symptoms (7 items), Negative Symptoms (7 items), and General Symptoms (16 items).

Given that individuals with autism can have empathic deficits (Baron-Cohen and Wheelwright, 2004), control participants completed the Autism Quotient (AQ; Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001), which is a reliable and valid measure of autism spectrum symptomatology (Baron-Cohen et al., 2001). Individuals scoring above a 26, above which it is likely that an individual may meet criteria for an autism spectrum disorder (Woodbury-Smith, Robinson, Wheelwright, & Baron-Cohen, 2005), were excluded from primary analyses.

Controls also completed the Short Wisconsin Schizotypy Scale, which has proven to be a valid and reliable measure of schizotypy (SWSS; Winterstein et al., 2011). Although there is no specific cutoff score for this measure, individuals scoring more than one standard deviation above the mean for this sample were excluded, as recommended by the original author of this measure (T. Kwapil, personal communication, July 1, 2014). As such, two individuals meeting these criteria were excluded from this sample.

Functional Measures (schizophrenia sample only)

Social and role functioning

Social and role functioning was measured with the Specific Levels of Functioning Scale (SLOF; Schneider and Struening, 1983). The SLOF comprises 43 items that assess an individual's performance in "real-life" situations along 4 domains: Interpersonal Relationships, Social Acceptability, Activities of Community Living, and Work Skills. Each item is rated on a 5-point scale.

Cognition

Cognition was measured using the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS; Randolph, Tierney, Mohr, & Chase, 1998). The RBANS is a brief neuropsychological screening battery that takes approximately 30 minutes to complete and is comprised of five index scores (Immediate Memory, Visuospatial/Constructional, Language, Attention, and Delayed Memory) as well as a total composite score. The RBANS has demonstrated good sensitivity, convergent validity, and reliability in a schizophrenia sample (Gold, Queern, Iannone, & Buchanan, 1999). Only the total composite score was used in present analyses.

Procedure

All research assistants completed comprehensive training on administration of study measures prior to working with participants. Please see Appendix 1 for the steps involved in the administration of the PEERS.

Results

Preliminary Analyses

Data analyses were performed using SPSS version 22.0. Statistical significance was defined as $p < .05$.

The correlations among the five PEERS empathy items ranged from 0.423 to 0.863 across both samples, and all were statistically significant. As such, these items were summed into one variable, "Total Empathy," and this variable was used in subsequent analyses. Additionally, all social skill items were significantly correlated across Scene 1 and Scene 2, and across both samples (0.363 to 0.876). Thus, each item was summed across both scenes to create one composite variable for each item.

The internal consistency of the SLOF (self-report and informant report) and PANSS were calculated and found to be acceptable (Cronbach's alpha of .84, .87, and .74, respectively).

Although social skill and empathy are often considered to be overlapping constructs (Riggio, Tucker & Coffaro, 1989), the study examined to what extent the PEERS explains empathy in individuals with schizophrenia above and beyond general social skill. The social skill subscales were highly correlated to the Total Empathy variable (patients, 0.606-0.799; controls, 0.633-0.694; $p < .01$). In order to determine the specificity of this measure, each social skill subscale was included as a covariate in the construct validity analyses.

Hypothesis Testing

Reliability Analyses

The internal consistency of the PEERS (Cronbach's alpha) was calculated separately for patients and controls for each of the three social skill subscales (Verbal, Nonverbal, and Global), as well as for the Total Empathy composite and the IRI (Table 1).

Table 1: Internal consistency of PEERS and IRI.

	Cronbach's Alpha	
	Patients (N = 60)	Controls (N = 51)
PEERS Subscale		
Verbal (4 items)	0.58	0.74
Nonverbal (5 items)	0.89	0.89
Global (2 items)	0.86	0.91
Empathy (5 items)	0.87	0.88
IRI Subscale		
Fantasy (7 items)	0.41	0.57
Empathic Concern (7 items)	0.67	0.73
Perspective Taking (7 items)	0.56	0.77
Personal Distress (7 items)	0.63	0.73

Notes: IRI = Interpersonal Reactivity Index.

Raters of the role-play were required to attain acceptable reliability, determined by the two-way mixed intraclass correlation coefficient (ICC; Shrout & Fleiss, 1979) being at or above 0.6, as suggested by Chinn (1991). Interrater reliability was calculated on the ratings of the first 39 videos of the schizophrenia sample completed by the coders; ICCs for all items were above 0.7 with the exception of Appropriate Affect (0.654) and Cognitive Empathy (0.698).

Validity Analyses

Construct validity

Chi-square tests and analyses of variance (ANOVA) were used to examine group differences on demographic variables (see Table 2). Level of education and race/ethnicity were significantly different between groups; the NPC group was more likely to be Caucasian and to have obtained higher levels of education. These variables were thus included as covariates in subsequent ANCOVAs.

Table 2: Demographics.

	Patient		Control		Test Statistics		
	N	Mean (SD)	N	Mean (SD)	t, χ^2	df	p-value
Gender (% male)	60 (78.33)		51 (68.62)		$\chi^2 = 1.35$	1	0.25
Years of Education	60	12.92 (2.23)	47	16.94 (2.19)	t = 9.33	105	<.001
Race (% Caucasian)	60 (53.33)		51 (78.43)		$\chi^2 = 16.72$	3	0.001
Caucasian	32		40				
African American	24		5				
Asian	2		6				
Other	2		0				
Age	60	39.52 (12.29)	51	39.92 (13.68)	t = .16	109	0.87

Table 3: Descriptive statistics for the PEERS and IRI.

	Patient (N = 60)		Control (N = 51)		Effect Size (Cohen's <i>d</i>)
	Mean	Standard Deviation	Mean	Standard Deviation	
PEERS					
Emotional Empathy	2.80	0.80	3.81	0.77	1.29
Cognitive Empathy	3.18	0.71	3.94	0.57	1.18
Ideomotoric Empathy	2.85	0.77	3.69	0.75	1.10
Helpfulness	3.79	0.89	4.08	0.52	0.40
Overall Empathy	3.10	0.68	3.89	0.62	1.21
Total Empathy	15.72	3.16	19.41	2.68	1.26
Verbal Social Skill Subscale	23.8	3.26	31.08	3.29	2.22
Nonverbal Social Skill Subscale	33.41	5.06	40.8	3.93	1.63
Global Social Skill Subscale	12.46	2.13	15.26	2.34	1.25
IRI					
Perspective Taking	23.93	4.85	26.76	3.89	0.64
Empathic Concern	27.05	4.94	28.31	3.74	0.29
Personal Distress	18.43	5.16	14.88	3.99	0.77
Fantasy	22.25	5.53	21.51	4.42	0.15

Notes: IRI = Interpersonal Reactivity Index. Range of possible values for: individual PEERS items = 1-5; Total Empathy = 5-25; Verbal Social Skill = ; Nonverbal Social Skill = ; Global Social Skill = ; IRI subscales = 7-35. Cohen's *d* was calculated using the pooled standard deviation.

Construct validity was evaluated by investigating whether there were significant group differences on the PEERS empathy items. Effect sizes were also calculated to determine the magnitude of the group differences (

Table 3). Individuals with schizophrenia demonstrated significantly greater deficits on the PEERS Total Empathy than NPCs, $F(1,109) = 43.276$, $p < 0.001$ (see

Table 3 for descriptive statistics of the PEERS). These group differences remained statistically significant after controlling for level of education ($F(1, 104) = 16.866, p < 0.001$), race/ethnicity ($F(1, 108) = 39.625, p < 0.001$) and Global Social Skill, ($F(1, 107) = 8.196, p = 0.005$). However, the differences between groups were no longer statistically significant after controlling for Verbal Social Skill ($F(1, 107) = 0.42, ns$). The same held true for Nonverbal Social Skill ($F(1, 107) = 0.553, ns$). This suggests that while individuals with schizophrenia performed more poorly on the PEERS than did the NPC group, the PEERS does not account for possible deficits in empathy above and beyond general social skill.

Next, differences between the schizophrenia and NPC groups on the four subscales of the IRI were examined using a multivariate analysis of variance (MANOVA). Given that the IRI was used in the convergent validity analyses (described below), we examined whether the IRI detected similar differences in empathy between patients and controls as did the PEERS. Individuals with schizophrenia performed significantly differently than controls on two of the subscales of the IRI, Perspective Taking ($F(1, 109) = 11.231, p = 0.001$) and Personal Distress ($F(1, 109) = 15.974, p < 0.001$), such that patients self-reported worse perspective taking skills and increased personal distress as compared to controls (see

Table 3 for descriptive statistics of the IRI). This inverse relationship has been demonstrated elsewhere (D'Orazio, 2002; Davis, 1980). Patients and controls were not significantly different on the other two subscales, Fantasy ($F(1, 109) = 0.592$, ns) and Empathic Concern ($F(1, 109) = 2.243$, ns).

Consistent with the construct validity analyses of the PEERS, we also included race and level of education as covariates in the analyses of the IRI subscales. The findings were unchanged after controlling for race. Controlling for level of education only affected Empathic Concern such that patients now performed significantly worse than controls ($F(1, 104) = 4.554$, $p = 0.035$).

Convergent validity

To evaluate convergent validity, a series of bivariate correlations within each of the patient and control groups were computed. Correlations among all five PEERS empathy items, the composite empathy item, the IRI, and theory of mind tasks were examined. In the schizophrenia sample, the Ideomotoric ($r = 0.275$, $p < .05$) and Helpfulness ($r = 0.305$, $p < .05$) items, as well as Total Empathy ($r = 0.268$, $p < .05$), were significantly positively associated with the Fantasy subscale of the IRI, indicating that greater ability to imagine oneself in the role of a fictional character is associated with an increased ability to respond empathically. Several of the PEERS empathy items (Emotional Empathy, $r = 0.365$, $p < .01$; Helpfulness, $r = 0.289$, $p < .05$; Overall Empathy, $r = 0.324$, $p < .05$; Total Empathy, $r = 0.343$, $p < .01$) were also significantly positively associated with the Eyes task. This suggests that greater theory of mind abilities may be associated with greater behavioral empathic abilities. Notably, the Eyes task was not significantly correlated with any of the social skill subscales. Finally, the Brune theory of mind task was not associated with any of the PEERS empathy items or the social skill subscales.

In controls, the PEERS empathy items were not significantly correlated with any subscale of the IRI or with either theory of mind task.

Discriminant validity

Discriminant validity was explored through computing correlations between the PEERS empathy items and a measure of cognition in the schizophrenia sample only. The RBANS composite score was significantly positively correlated only with the Emotional Empathy item, $r = 0.287$, $p < .05$; the other correlations ranged from -0.1 to 0.216 . This is consistent with the expectation that the PEERS would not measure cognitive ability.

Ecological validity

Ecological validity was examined by conducting correlational analyses between the PEERS empathy items and the SLOF. The Work Skills subscale of the SLOF was significantly negatively correlated with the Cognitive Empathy item ($r = -0.32$, $p < .05$), which was not in the expected direction. No other associations between the PEERS empathy items and the subscales of either version of the SLOF were found. This is inconsistent with the expectation that empathic abilities would be associated with social functioning.

Post Hoc Analyses

The associations between the PEERS and schizophrenia symptoms were examined to determine if there was any relationship between symptom severity and an individual's performance on the role-play (see Table 4). PANSS negative symptoms were significantly negatively correlated with nonverbal social skills, global social skill, and all empathy items as well as the composite, such that individuals with more negative symptoms demonstrated poorer nonverbal and global social skills as well as less empathy. PANSS positive symptoms and general symptoms were generally uncorrelated with both the social skill and the empathy items.

Table 4: Correlations between PEERS and PANSS subscales.

	Total of Empathy Items	Cognitive Empathy	Emotional Empathy	Ideomotoric Empathy	Helpfulness	Overall Empathy	Verbal Social Skill	Nonverbal Social Skill	Global Social Skill
PANSS Positive	-0.05	-0.06	-0.10	0.08	-0.05	-0.07	-0.09	-0.03	-0.18
PANSS Negative	-0.41**	-0.29**	-0.39**	-0.34**	-0.28*	-0.38**	-0.18	-0.39**	-0.26*
PANSS General	-0.16	-0.18	-0.21	0.06	-0.14	-0.22	-0.21	-0.17	-0.30*

Notes: PANSS = Positive and Negative Syndrome Scale. * $p < .05$; ** $p < .01$.

The group differences on the IRI subscales were explored further, controlling for each of the three social skill subscales, to determine if the IRI was able to discriminate between empathic ability of the schizophrenia and control groups above and beyond social skill. Group differences on Empathic Concern and Fantasy remained nonsignificant, while significant group differences on Perspective Taking became nonsignificant. Group differences on the Personal Distress subscale remained statistically significant, suggesting that this subscale may measure a domain of empathy that is unrelated to verbal, nonverbal, and general social skill abilities.

Discussion

The results of the present study indicate that the PEERS is a psychometrically reliable role-play measure of an individual's empathic ability. The PEERS demonstrated adequate internal consistency and inter-rater reliability. There was also evidence of construct validity, as patient and healthy controls significantly differed in the sum of PEERS empathy items in the expected direction. However, these differences did not persist after controlling for verbal and non-verbal social skills. In patients, the PEERS demonstrated convergent validity with a measure of theory of mind, as well as with one subscale of a self-report measure of empathy. Interpretations of these findings and implications for the use and continued development of the PEERS will be discussed below.

The construct validity analyses indicate that although individuals with schizophrenia perform significantly worse than controls on the PEERS, an individual's social skills explains most of the variability in that person's behavioral empathic responding. Therefore, it is unclear if we are demonstrating that people with schizophrenia are worse at empathic responding, or whether we are simply demonstrating that they have poorer social skills, which has been shown in numerous other studies (Gibson, Penn, Smedley, Leserman, Elliott, & Pedersen, 2014; Mueser, Bellack, Morrison & Wixted, 1990; Mueser, Bellack, Douglas & Morrison, 1991; Mueser et al., 1996).

As was previously discussed, social skill and empathy are overlapping constructs; empathy is required in order to appropriately and successfully interact with other people (Davis, 1996). In a role-play assessment of empathy and prosocial behavior developed for young children interacting with their mothers, (Zahn-Waxler et al., 1992), the authors did not look at social skill directly, but instead incorporated behaviors related to social skill into their coding scheme. In the Social Skill Rating Scale (SSRS; Gresham & Elliott, 1990), a commonly used and empirically validated social skill rating paradigm developed for use in schools, empathy is included as one of the four social skill subscales. Thus, the overlap seen in the PEERS may not be due to its inability to measure empathy, but instead due to the way in which the items were constructed.

The association between the Fantasy subscale (measuring an individual's tendency to consider the perspectives of fictional characters) and several PEERS empathy items in the context of a contrived (fictional) role-play scenario may be explained in the context of autobiographical memory. Individuals with schizophrenia have poor autobiographical memory, and this is related to theory of mind deficits; people are less able to infer others' mental states due to both an inability to retrieve memories (because of cognitive deficits) and extensive social isolation (Corcoran & Frith, 2003). Thus, individuals with schizophrenia may more readily and more easily draw on experiences of fictional characters to empathically respond to other people, rather than their own experiences.

The association between the Eyes task and the PEERS empathy items in the absence of a similar relationship between the Eyes and the social skill subscales indicates that some of the information obtained by the PEERS empathy items is not completely explained by an individual's social skill ability (although as noted in the preliminary analyses, they are significantly correlated with one another). This is contrary to research on theory of mind and social skill, which indicates that individuals with schizophrenia experience deficits in both areas and that these deficits are correlated (Couture, Penn & Roberts, 2006). However, theory of mind has also been shown to overlap with empathy (Baron-Cohen et al., 2001). Some research has also indicated that theory of mind is comprised of two distinctly different processes that rely on different areas of the brain: the ability to identify mental states based on observable cues (mental state decoding) and the ability to reason about others' mental states (mental state reasoning) (Sabbagh, 2004). Bora, Eryavuz, Kayahan, Sungu, and Vexnedaroglu (2006) demonstrated that mental state decoding tasks (e.g., the Eyes task) are more closely related to a measure of social functioning than mental state reasoning tasks (e.g., the Brune theory of mind task). The Eyes task may be more closely tied to the emotional aspects of mind reading and empathy, rather than those required for basic social skill (Bora et al., 2006).

The PEERS demonstrated acceptable discriminant validity, but did not demonstrate ecological validity; only one PEERS empathy item, Cognitive Empathy, was significantly negatively correlated with the Work Skills subscale on the SLOF. Since this analysis involved multiple correlations, this may have been due to Type I error. The PEERS empathy items were also significantly negatively associated with negative symptoms. These findings are consistent with research on schizophrenia symptomatology and empathic ability (Derntl et al., 2009).

This study has a number of limitations. An initial power analysis was conducted and revealed that a sample of 120 (60 per group) would be sufficient to detect group differences. Due to the tight timeline of the study, we were not able to recruit the complete sample of controls. As such, the study may be underpowered, though effect size analyses indicate that the differences in means observed were of a medium to large magnitude. Another limitation concerns the administration of the PEERS. Role-plays are widely used in assessment of social skill; it is possible that empathy is a construct that is not amenable to the exact same type of assessment, and some modification of the paradigm may be necessary. Rather than create a fictional role-play, a more ecologically valid way of eliciting empathy may be to incorporate deception, where the participant would be unaware that the confederate was acting (e.g., Zahn-Waxler et al., 1992). Alternately, a rating of the confederate's ability to convey the emotion required by the scene could be included, which could be used as a covariate in future analyses so as to determine how well the participant demonstrated empathy regardless of how well the confederate "played the part". Additionally, given the significant differences in race between the patient and control groups, the possibility that ratings were affected by raters' perceptions of race and culture cannot be ruled out; alternately, the race of the raters may also be relevant. Future studies involving the PEERS should consider the potential influence of the race of all involved in the administration and rating of the task.

Finally, the PEERS included two scenes, only one of which addressed empathy, and then only a single emotion to which the participant was to empathically respond (sadness). Future research with the PEERS can enhance its content validity to include several scenes that ask the participant to respond with empathy to a number of different emotions in (i.e., happiness, anger). Further, a scenario involving work-related problems may be difficult for some individuals with schizophrenia to relate to, given the problems with vocational attainment that people can often experience (Twamley, Jeste, & Lehman, 2003). Future iterations of the PEERS should incorporate a wider range of scenarios that could apply to a broader range of experiences (e.g., comforting a friend after a fight with a loved one).

In summary, this is the first known study to utilize a role-play paradigm in the assessment of empathy in individuals with schizophrenia. PEERS administration is brief (3-5 minutes) and appears to evidence some convergent and construct validity, as well as adequate internal consistency and interrater reliability. However, further research is needed to better understand the ability of the PEERS to measure empathy separate from social skill. It may be the case that social skill and empathy are not separable constructs, at least via a role-play paradigm, and that they may be better understood as related constructs instead.

A revised version of the PEERS could be useful in clinical research contexts where it is important to determine the social skill and empathic abilities of individuals with schizophrenia as a means to assess and track the potential improvement of these skills as a result of a particular treatment. The findings of the present study may also suggest

that further investigation into clinician-rated measures of a client's empathy is warranted. Such a tool could be based on the client's interactions with the clinician, and could be a useful means to quickly assess an individual's empathic ability. As has been discussed, self-report measures can only do so much to address one's real-life abilities, and it may be useful to use the PEERS as an adjunct measure of behavioral empathic ability and social skill.

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EG conducted all analyses and certifies the accuracy of these results.

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Appendix 1. Administration of the PEERS

1. Research assistant (RA) informs participant that they will be videotaped while engaging in two role-plays.
2. Scene 1: RA explains the following to the participant:
 - a. For this scene, I want you to imagine that I am a new neighbor of yours that has moved in down the hall from you. You have noticed me moving boxes into my new apartment and you decided to come over and talk to me. You will have 90 seconds to get to know one another; the goal of the conversation is to get to know this new person. I will time 90 seconds and will let you know when time is up.
3. RA presses record on the camera and begins timing 90 seconds on a stopwatch once he or she sits down beside the participant, and the conversation begins. When time is up, the RA indicates to the participant that the conversation is over.
4. Scene 2: RA explains the following to the participant
 - a. For this conversation, I want you to imagine that I am a friend of yours, and you happen to notice that I seem upset. Your job is to figure out what is wrong, why I am upset and to see if there's anything you can do. I will time 90 seconds and will let you know when time is up.
5. RA repeats procedure from Scene 1.