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Social trait judgment and affect recognition from static faces and video vignettes in schizophrenia

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Abstract

Social impairment is a core feature of schizophrenia, present from the pre-morbid stage and predictive of outcome, but the etiology of this deficit remains poorly understood. Successful and adaptive social interactions depend on one's ability to make rapid and accurate judgments about others in real time. Our surprising ability to form accurate first impressions from brief exposures, known as "thin slices" of behavior has been studied very extensively in healthy participants. We sought to examine affect and social trait judgment from thin slices of static or video stimuli in order to investigate the ability of schizophrenic individuals to form reliable social impressions of others. 21 individuals with schizophrenia (SZ) and 20 matched healthy participants (HC) were asked to identify emotions and social traits for actors in standardized face stimuli as well as brief video clips. Sound was removed from videos to remove all verbal cues. Clinical symptoms in SZ and delusional ideation in both groups were measured. Results showed a general impairment in affect recognition for both types of stimuli in SZ. However, the two groups did not differ in the judgments of trustworthiness, approachability, attractiveness, and intelligence. Interestingly, in SZ, the severity of positive symptoms was correlated with higher ratings of attractiveness, trustworthiness, and approachability. Finally, increased delusional ideation in SZ was associated with a tendency to rate others as more trustworthy, while the opposite was true for HC. These findings suggest that complex social judgments in SZ are affected by symptomatology.

Keywords

affect recognition; social judgment; social cognition; nonverbal behavior; thin slices

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Corresponding author and location of work: Sohee Park, PhD., Vanderbilt University, Department of Psychology, 111 21st Ave. South, 301 Wilson Hall, Nashville, TN 37240; sohee.park@vanderbilt.edu, Phone: +1 615 322 3435, Fax: +1 615 343 8449. *This paper is dedicated to the memory of Nalini Ambady, who could always see beyond the 'thin slices' to uncover the truth.*

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1. Introduction

Social cognitive impairments are core features of schizophrenia and lead to poor functional outcome (Marwick and Hall, 2008; Penn et al., 2008; Hooker and Park, 2002; Bell et al., 2009; Fett et al., 2011). In particular, individuals with schizophrenia have difficulty decoding mental states and intentions of others (Crespi and Badcock, 2008; Pinkham et al., 2008) and such theory of mind impairments can hinder everyday social interactions. In addition to the well-established theory of mind deficits, another component of social cognitive impairment in schizophrenia is inaccurate or anomalous social trait judgments (e.g. trustworthiness). Studies of trait judgments in healthy subjects show that these judgments are made in a rapid, automatic, unreflective manner (Ambady and Rosenthal, 1992; Ambady, 2010; Todorov et al., 2009; Willis and Todorov, 2006), and are frequently used in social decisionmaking (Balew and Todorov, 2007; Todorov et al., 2005). However, social trait judgments have not been extensively examined in schizophrenia. Our current understanding of these judgments in schizophrenia is particularly hindered by a lack of investigations into other traits and a reliance on static face stimuli.

The existing literature on trait judgments in schizophrenia has focused disproportionately on trustworthiness. Baas, van't Wout et al. (2008) found that individuals with schizophrenia rate faces to be more trustworthy than healthy controls, and Couture et al. (2008; 2010) found this for untrustworthy faces in particular. Other studies have found intact trustworthiness judgment in the schizophrenia-spectrum (Baas, Aleman et al., 2008; Haut and MacDonald, 2010). This inconsistency may be due to widely varying symptomatology both in the groups studied and the disease heterogeneity in general (Hooker et al., 2011; Pinkham et al., 2008; Haut and MacDonald, 2010). Beyond trustworthiness judgments, however, there have been few attempts to study social trait judgments in schizophrenia. Patients' ratings of likeability (Haker and Rössler, 2009; Taylor et al., 2011) and friendliness (Klien et al., 1992) are thought to be similar to controls' ratings. However, Haut and MacDonald (2010) found that schizophrenia patients rated face stimuli to be more attractive than did controls. Hall et al. (2004) reported reduced accuracy of schizophrenic patients in judgments of approachability, intelligence, and distinctiveness, than controls but whether these errors arose from rating more or less favorably than controls was not discussed in this study. Most recently, Antonius et al. (2013) found preserved familiarity preference (change in attractiveness ratings after exposure) in schizophrenia patients. Therefore, evidence from the available literature on trait judgment in schizophrenia points to a possible calibration problem in this process, rather than a complete failure to consider and generate such judgments. More research is needed to determine whether anomalous trait judgments are more associated with certain symptoms (e.g. delusions), which may help to explain divergent findings across these studies.

The other limiting factor seen in the current literature is that studies have exclusively relied on static face stimuli. More recent efforts to study social cognition in schizophrenia have moved away from facial displays and have begun to employ other types of social stimuli, including bodily cues from posture and gait (Bigelow et al., 2006; Couture et al., 2010; Henry et al., 2010; Peterman et al., 2014). These cues are of particular importance for the study of how we first select and approach social partners, before cues from the face are

available. Combined with facial cues, the use of more proximal bodily cues offers greater external validity as well as a more holistic understanding of social trait judgments in schizophrenia.

In real life, social trait judgments are made rapidly and from very little exposure (think ‘first impressions’), and are therefore well suited for scientific study. These judgments have been elicited in the laboratory through presentation of ‘thin slices’ of behavior, which are brief exposures to nonverbal behavioral cues (Ambady and Rosenthal, 1992). The ‘thin slice’ literature shows that healthy people are able to rapidly evaluate attractiveness, trustworthiness, honesty, intelligence, political affiliation and even sexual orientation of others within half a minute of exposure to nonverbal cues (Ambady and Rosenthal, 1993; Rule and Ambady, 2008, 2010; Rule et al., 2009). ‘Thin slice’ judgments are also surprisingly accurate, when accuracy is defined as convergence with real-world criteria (Ambady and Rosenthal, 1992, 1993; Zebrowitz and Collins, 1997; Ambady et al., 2000), more so than judgments resulting from extended deliberation (Ambady 2010; Rule, Ambady and Hallett, 2009). Finally, ‘thin slice’ judgments are predictive of events such as teacher evaluations (Ambady and Rosenthal, 1993), courtroom outcomes (Blanck et al., 1985), and election results (Friedman et al., 1980; Ballew and Todorov, 2007; Spezio et al., 2012). Because ‘thin slice’ stimuli are rich behavioral cues from the face and body, they generate social judgments that more closely resemble real life judgments. Therefore, ‘thin slice’ judgments offer excellent external validity compared with more traditional social cognition tasks involving limited nonverbal cues (e.g. static facial emotion displays). Furthermore, real life social interactions demand continuous tracking of peoples’ speech, behavior, and subtle emotional cues. When available, this information is likely used to form and update trait inferences. It is possible that schizophrenia patients’ working memory deficits (Lee and Park, 2005) and tendency to ignore social context when making social judgments (Green et al., 2008), would result in aberrant social inferences. For these reasons, we argue that using ‘thin slices’ of behavior methodology is particularly useful for the study of social trait judgment in schizophrenia.

The current study responds to these highlighted concerns in the literature by revising the standard methodological approach for social trait judgment in schizophrenia. This study adds to the literature in two important ways. First, we included a broader set of social traits, following Hall et al. (2004) and other recent efforts to explore beyond trustworthiness judgments. Second, we contrasted the traditional stimulus set of static emotional faces with dynamic ‘thin slice’ video vignettes, rich in nonverbal social and behavioral cues.

2. Method

2.1. Participants

Twenty-three schizophrenia outpatients (SZ) who met the DSM-IV diagnostic criteria for schizophrenia were recruited from a psychiatric facility in Nashville, TN. Two SZ were excluded due to poor performance on the control tasks (see section 2.2.2), so final SZ group included 21 subjects. All patients were taking antipsychotic medication at the time of testing with a mean chlorpromazine (CPZ) equivalent dose of 375 mg/kg/day (SD=277). Symptoms were assessed with the Brief Psychiatric Rating Scale (BPRS; Overall and Gorham, 1962),

the Scale for the Assessment of Positive Symptoms (SAPS; Andreasen, 1984a), and the Scale for the Assessment of Negative Symptoms (SANS; Andreasen, 1984b). Twenty-one healthy control participants (HC) were recruited by advertisements in the community. One HC was excluded due to poor performance on the control task (see section 2.2.2) so final HC group included 20 subjects. Other exclusion criteria were neurological disorders, current or history of substance abuse, history of severe head injury, or age over 60 years for both SZ and HC. HC were excluded for Axis I disorder or a family history of schizophrenia. SZ were excluded for comorbid Axis I disorder. Intelligence was estimated using the National Adult Reading Test (NART; Nelson, 1982). All subjects reported having normal or corrected-to-normal vision. After providing a description of the experiment to the participants, written informed consent, approved by the Vanderbilt University Institutional Review Board, was obtained. All participants were paid. SZ and HC were matched for age, sex, and race, though HC had higher IQ and more years of education than SZ. Demographic characteristics for the two groups are presented in Table 1.

2.2. Design and Procedure

Computerized social judgment tasks designed to assess face recognition, affect recognition, and social trait judgment abilities were run using PsyScope on a Macintosh computer. There were two blocked stimulus conditions: face stimuli (pictures) and ‘thin slices’ (videos). Presentation order for stimulus conditions was counterbalanced across subjects.

Questionnaires were also completed and are described in 2.2.3.

2.2.1. Stimuli—Pictures were selected from the Karolinska Directed Emotional Faces database (KDEF; Lundqvist and Litton, 1998) and videos were adapted from The Awareness of Social Inference Test (TASIT; McDonald et al., 2003). Both KDEF and TASIT provide standardized, color stimuli designed to depict six emotions and neutral, and have been used to assess social cognition in schizophrenia (Horan et al., 2009; Kern et al., 2009; Doop and Park, 2009; Antonius et al., 2013).

Fifty-four KDEF images from six actors (three male, three female) were selected. Of these, forty-two of these images depicted seven emotion conditions (happy, surprised, sad, angry, disgusted, afraid, neutral) and were oriented straight to the camera. Twelve neutral images oriented 45° to camera were used for the face recognition control task. Thirty-five videos were adapted from Part 1 of TASIT versions A and B. In these TASIT scenes, one or two actors act out scripts in a way that depicts seven emotion conditions (happy, surprised, sad, angry, disgusted, anxious, neutral). A 15s block was randomly selected from the middle of each full-length TASIT scene. Audio was removed in order to control for verbal content. The final stimuli included five principal actors (two men, three women) in the seven emotion conditions. All actors were Caucasian. Twelve images of the actors’ faces during neutral scenes were used in the face recognition perceptual control task¹.

¹KDEF actors included: BF01, BF07, BF29, AM08, AM28, AM29. TASIT scenes included the practice item and the following test items: Version A, 3, 4, 6, 7, 10, 11, 12, 13, 16, 18, 19, 20, 21, 22, 24, 26, 28; Version B, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 19, 20, 23, 24, 26, 28.

2.2.2. Social Judgment Task—During the pictures condition, participants viewed images for 1s and responded to each face. While studies have demonstrated that less than 100ms exposure to a novel face is sufficient to make trait judgments, it has been shown that with 1000ms exposure, participants were more confident in their judgments and were more likely to differentiate traits (Todorov et al. 2009; Willis and Todorov, 2006). After the stimulus appeared, participants were first prompted to identify emotion from the seven options presented. Then participants were prompted to make trait judgments of attractiveness (attr), trustworthiness (trust), approachability (appr), and intelligence (int) from four options ranging from very negative to very positive (for example: “very unattractive”, “somewhat unattractive”, “somewhat attractive”, “very attractive”). After 42 trials, participants completed the control task. The control task was intended to screen for impairment in face processing and consisted of identity matching and age judgments. For each of the six KDEF actors, participants had to match the identity of one neutral face to a target image among three choices. Choices were always of pictures of KDEF actors of the same sex, displaying neutral emotion at 45° angle to the camera. After six trials of identity matching, participants rated the same six neutral faces on age, by choosing from six options (19 or younger, 20–29, 30–39, 40–49, 50–59, 60 or older).

During the videos condition, participants watched videos for 15s each and responded to each video. Participants were instructed to focus on the principal actor in each video (identified for them). Participants identified emotion and made trait judgments in the same way as described for the pictures condition. After 35 trials, participants completed the control task, comprised of five trials (one for each actor). Participants responded in the same way as described for pictures condition, matching faces and judging age.

2.2.3. Questionnaires—Participants completed the Peters et al. Delusions Inventory (PDI; Peters et al., 2004) to measure delusional ideation, and the Social Functioning Scale (SFS; Birchwood et al., 1990). HC also completed the Schizotypal Personality Questionnaire (SPQ; Raine, 1991) to index schizotypy. Mean PDI, SFS, and SPQ scores are reported in Table 1.

2.3. Data Analysis

Identification accuracy for the face recognition control trials was averaged for the two stimulus conditions to produce an overall accuracy for face recognition. Age judgment was likewise averaged. Mean affect recognition accuracy was calculated for all stimulus and affect conditions. After coding trait judgment responses from 1–4 (1 is least positive and 4 is most positive) mean judgment ratings were calculated for each trait by stimulus and affect conditions. Statistical analyses were performed using SPSS. Where assumption of sphericity is violated (Mauchly's test), Greenhouse-Geisser corrected degrees of freedom are reported.

3. Results

3.1. Control Tasks

Both groups performed well at matching faces (HC $M=0.99$, $SD=0.03$; SZ $M=0.93$, $SD=0.19$), and difference did not reach statistical significance ($t(20.9)=1.56$, $p=0.14$,

$d=0.44$). Both SZ ($M=2.95$, $SD=0.28$) and HC ($M=2.80$, $SD=0.23$), thought actors to be approximately in their late 20s (for scoring, age response of 20–29 was coded as ‘2’, while 30–39 was coded as ‘3’). Though SZ rated actors to be a little older, group difference for age ratings did not reach statistical significance ($t(39)=1.79$, $p=0.08$, $d=0.59$).

3.2. Affect Recognition

Group means and t-test statistics for affect recognition are reported in Table 2. SZ performed worse than HC on affect recognition. A repeated-measures ANOVA was used to examine the main effects of group and stimulus type. IQ and education were included as covariates. The ANOVA showed the main effect of group ($F(1,37)=20.41$, $p<0.001$, $\eta_p^2=0.36$) (Figure 1). There was no main effect of stimulus type ($F(1,37)=0.00$, $p=0.99$, $\eta_p^2=0.00$). However, there was trend-level interaction between group and stimulus type ($F(1,37)=3.52$, $p=0.07$, $\eta_p^2=0.09$). There was also a trend-level effect of affect condition ($F(6,32)=2.04$, $p=0.06$, $\eta_p^2=0.05$), and a significant interaction between stimulus type and affect condition ($F(4.85, 33.15)=3.46$, $p=0.006$, $\eta_p^2=0.09$). Separate analyses were conducted to investigate the effect of stimulus gender on emotion recognition accuracy. Accuracy was higher for female stimuli across both stimulus conditions ($F(1,39)=8.11$, $p=0.007$, $\eta_p^2=0.17$). There was no stimulus gender by group interaction ($F(1,39)=1.34$, $p=0.25$, $\eta_p^2=0.03$).

3.3. Trait Judgment

Group means and t-test statistics for trait judgments are reported in Table 3. A repeated-measures ANOVA was used to examine group means for trait ratings and investigate effect of stimulus and affect conditions. IQ and education were included as covariates. There was a main effect of stimulus condition ($F(1,37)=6.0$, $p=0.02$, $\eta_p^2=0.14$); participants gave more favorable ratings in the videos condition. There was no main effect of trait ($F(1.95, 72.22)=1.67$, $p=0.20$, $\eta_p^2=0.04$), and no trait-by-group interaction ($F(1.95, 72.22)=1.88$, $p=0.16$, $\eta_p^2=0.05$). There was a significant main effect of affect condition for social trait judgments made ($F(2.02, 74.75)=4.64$, $p=0.01$, $\eta_p^2=0.11$), with less favorable trait judgments generally made for affectively negative faces and videos. Importantly, there was no main effect of group on trait judgments ($F(1,37)=1.91$, $p=0.18$, $\eta_p^2=0.05$). Separate analyses were conducted to investigate the effect of stimulus gender on trait ratings. Trait ratings were higher for female stimuli across both stimulus conditions ($F(1,39)=25.68$, $p<0.001$, $\eta_p^2=0.40$). There was no stimulus gender by group interaction ($F(1,39)=0.001$, $p=0.98$, $\eta_p^2=0.00$).

3.4. Correlational Analyses

Table 4 reports r-values for correlational analyses involving trait ratings. In the pictures condition, *attr*, *trust*, *appr*, but not *int* ratings, were positively correlated with patients’ positive symptoms (SAPS; Figure 2). In the videos condition, *trust* ratings were positively correlated with SAPS. BPRS scores positively correlated with *attr* and *appr* ratings in the pictures condition.

No relationship was found between the HC trait ratings with total SPQ or its factors. However, in HC, total PDI was negatively correlated with picture *trust* ratings, while the opposite relationship was found in SZ (Figure 3).

In SZ, higher attractiveness and *trust* ratings in the pictures condition, as well as higher *attr* ratings in the videos condition, correlated with poorer performance of skills necessary for independent living (SFS Independence-performance). In HC, higher *appr* ratings in the videos condition were associated with more prosocial activities (SFS-Prosocial).

4. Discussion

This study found intact social trait judgment in the same group of SZ who show significant affect recognition impairment. This is surprising as the affect and trait judgments were generated from the same stimuli. However, previous neuroimaging studies support that such a dissociation is possible, demonstrating that the two social processes rely on at least partially non-overlapping brain areas (Heberlein et al., 2004; Heberlein and Saxe, 2005). This raises the question of whether patients use emotion cues in the formation of complex social judgments, as they arrive at judgments similar to controls even after improperly identifying the affect. Further exploration of the role that emotional cues have in the formation of trait judgments is merited.

Our results replicate the well-published general and specific affect recognition deficits in schizophrenia (see Kohler et al., 2010 for review). Recent studies have moved beyond static face stimuli to explore these deficits (Bigelow et al., 2006; Couture et al., 2010; Henry et al., 2010; Peterman et al., 2014), and we extend this finding in ‘thin slice’ video vignettes. This study also builds upon the growing literature on the quality of trustworthiness judgments in schizophrenia and investigated the ability of SZ to make judgments of approachability, attractiveness, and intelligence. We replicated previous studies that found intact judgments of trustworthiness (Baas, Aleman et al., 2008; Haut and MacDonald, 2010), and our results indicate this also extends to a broader set of traits.

However, while as a group SZ made similar judgments to HC, we found an intriguing relationship with positive symptoms and delusional ideation. Results from Pinkham et al. (2008), Haut and MacDonald (2010), and Hooker et al. (2011) support the view that certain individuals with schizophrenia, particularly those with high levels of delusions and paranoia, may differ from healthy controls on trait judgments. Similarly, Antonius et al. (2013) observed that subgroups of patients (high vs. low aggression) might use different cues to form their trait judgments. Here we found that SZ with more severe positive symptoms made more favorable judgments of attractiveness, approachability, and trustworthiness to static faces. We did not find this same relationship with our video stimuli. Perhaps differences in stimulus parameters such as presentation duration, amount of nonverbal cues available, or even the dynamic nature of a video stimulus, affected the social judgments made. This further underscores the importance of using more ecologically valid stimuli to better understand how individuals with schizophrenia make social judgments in their everyday lives.

It is intriguing that the more psychotic patients would have an especially favorable view of others, as our results suggest. However, Couture et al. (2008, 2010) previously found that schizophrenia-spectrum patients were more likely than controls to rate an untrustworthy face as trustworthy. Furthermore, this positive bias in social judgments has also been shown in

patients with bilateral amygdala damage (Adolphs, 1998) as well as individuals with autism (Adolphs, 2001). Beyond social judgments, previous studies have shown that schizophrenia patients have elevated preference ratings for everyday things, including hedonic judgment of food (Folley and Park, 2010) and smell (Dooop and Park, 2006; Cumming et al., 2011). So perhaps the direction of a bias is less relevant to consequences than the presence of a bias itself. Mistakenly believing that someone is very approachable and trustworthy is perhaps just as likely to result in adverse social interactions as much as mistakenly believing that someone is very unapproachable and untrustworthy. Patients with this positive bias may be more likely to engage people who wish to hurt or take advantage of them.

We also found that the relationship between delusional ideation and trustworthiness judgments significantly differed by subject group. In HC, elevated delusional ideation was associated with more negative trustworthiness judgments, while in SZ the opposite association was observed. This indicates that while delusional ideation is useful in detecting individual differences in social judgment, it does not account for the directionality of the relationship. Future studies may look to identify such moderating variables.

The current study used ‘thin slices’ of behavior to investigate the quality of complex social judgments in schizophrenia. This study is the first to specifically investigate social trait judgment in schizophrenia using stimuli other than static faces, and brings us closer to understanding the quality of real-life social judgments made by these individuals in everyday social interactions. Individuals with schizophrenia exhibit impaired affect recognition but similar social trait judgment relative to healthy controls. The relationship between patients’ psychotic symptoms and their trait ratings of others remains an intriguing and important future line of research which may shed light on the differential findings in the literature for this heterogeneous disorder.

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Figure 1.
Accuracy (SD) of emotion recognition for HC and SZ by stimulus condition.

Figure 2.
SZ ratings of (a) attractiveness (ATTR), (b) trustworthiness (TRUST), and (c) approachability (APPR), to picture stimuli by SAPS total score.

Figure 3.
Correlation between trustworthiness judgment and delusional ideation for picture stimuli for HC and SZ.

Table 1Demographic and clinical characteristics of the study groups^a.

	SZ (N=21)	HC (N=20)	t(39)	p
Sex (Male/ Female)	13 M / 8 F	10 M / 10 F	$\chi^2= 0.59$	0.44
Age, years	40.62 (8.05)	38.00 (8.67)	1.00	0.32
Education, years	13.67 (2.56)	15.50 (2.31)	2.41	0.02
NART IQ	101.13 (10.42)	107.17 (7.52)	2.12	0.04
<i>Race</i>				
White	6	11	$\chi^2= 2.95$	0.09
Non-White	15	9		
<i>Clinical Symptoms</i>				
BPRS	13.10 (7.40)			
SAPS	15.71 (8.64)			--
SANS	21.95 (15.46)			
Illness Duration, years	17.86 (8.63)	--	--	--
Total PDI	104.33 (77.59)	37.45 (30.96)	3.59	0.001
Total SPQ		8.75 (8.33)	--	--
<i>Social Functioning Scale</i>				
Withdrawal	9.81 (2.52)	13.0 (1.60)	4.82	<0.001
Interpersonal	7.19 (1.60)	8.79 (0.42)	4.41	<0.001
Independence(P) ^b	29.52 (5.91)	31.58 (3.96)	1.30	0.20
Independence(C) ^c	35.95 (3.79)	38.05 (1.51)	2.34	0.03
Recreation	22.33 (4.40)	27.32 (4.66)	3.48	0.001
Prosocial	18.86 (8.94)	28.00 (7.61)	3.46	0.001
Employment	5.10 (3.75)	9.63 (1.01)	5.33	<0.001

^aData are given as mean (SD) except where noted.^bIndependence- Performance subscale measures the performance of skills necessary for independent living.^cIndependence- Competence subscale measures the ability to perform skills necessary for independent living.

Table 2

Mean percent accuracy and SD for emotion recognition by group and stimulus type.

Stimulus	Affect	HC	SZ	t(39)	p
<i>Pictures</i>					
	Average	81.78 (6.00)	71.99 (9.70)	3.86	<0.001
	Happy	97.50 (8.16)	92.06 (12.5)	1.66	0.11
	Surprised	95.00 (7.84)	85.71 (20.61)	1.93	0.07
	Neutral	90.00 (11.33)	76.19 (25.04)	2.29	0.03
	Sad	74.16 (19.85)	70.63 (18.18)	0.59	0.56
	Angry	89.16 (18.16)	80.16 (17.17)	1.63	0.11
	Disgusted	80.83 (22.47)	69.05 (21.27)	1.73	0.09
	Afraid	47.50 (22.48)	30.16 (18.00)	2.74	0.009
<i>Videos</i>					
	Average	77.15 (8.80)	60.00 (13.34)	4.83	<0.001
	Happy	92.00 (11.96)	84.76 (15.37)	1.68	0.10
	Surprised	70.50 (24.17)	65.71 (21.11)	0.68	0.50
	Neutral	72.00 (18.81)	66.67 (25.56)	0.76	0.45
	Sad	72.50 (23.14)	53.33 (19.32)	2.88	0.006
	Angry	68.00 (24.62)	41.90 (28.22)	3.15	0.003
	Disgusted	87.00 (13.42)	66.67 (27.08)	3.07	0.005
	Anxious	70.00 (20.00)	41.00 (27.19)	3.88	<0.001

Table 3

Mean and SD for trait ratings by group and stimulus type.

Stimulus	Trait	HC	SZ	r(39)	p
<i>Pictures</i>	ATTR ^a	2.43 (0.33)	2.45 (0.57)	0.17	0.87
	TRUST ^b	2.59 (0.28)	2.63 (0.41)	0.38	0.70
	APPR ^c	2.55 (0.31)	2.54 (0.35)	0.10	0.92
	INT ^d	2.67 (0.44)	2.78 (0.36)	0.94	0.35
<i>Videos</i>	ATTR	2.55 (0.42)	2.67 (0.56)	0.80	0.43
	TRUST	2.78 (0.39)	2.83 (0.39)	0.33	0.74
	APPR	2.65 (0.27)	2.78 (0.39)	1.21	0.23
	INT	2.80 (0.40)	3.02 (0.34)	1.83	0.08

^a ATTR= attractiveness
^b TRUST= trustworthiness
^c APPR= approachability
^d INT= intelligence

Table 4

Correlation coefficients (Pearson's r) for correlations between trait ratings and clinical measures.

	Group	df	Picture				Video			
			Attr	Trust	Appr	Int	Attr	Trust	Appr	Int
BPRS	SZ	19	.44*	.24	.44*	.02	.33	.25	.20	.08
SAPS	SZ	19	.58**	.55**	.74**	.27	.36	.44*	.39	.19
SANS	SZ	19	-.28	-.42	-.42	-.31	-.15	-.21	-.27	-.01
SFQ	HC	18	-.07	-.13	-.07	-.21	-.37	-.24	-.20	-.41
PDI	SZ	19	.35	.53*	.42	.28	.33	.27	.19	.19
	HC	18	-.28	-.47*	-.44	-.09	.009	-.001	-.31	-.37
SFS-W	SZ	19	.09	-.04	.14	-.08	-.13	-.12	-.04	-.27
	HC	17	.01	.36	.36	.13	-.005	.19	.32	.03
SFS-Inter	SZ	19	.05	-.10	.04	.004	-.09	.30	-.17	.07
	HC	17	.11	.04	.24	.14	.22	.25	.06	.08
SFS-Ip	SZ	19	-.51*	-.45*	-.35	-.26	-.47*	-.26	-.39	-.16
	HC	17	-.20	.11	.08	-.07	-.02	.00	.04	.12
SFS-Ic	SZ	19	-.11	-.19	-.01	.02	-.18	-.08	-.18	.04
	HC	17	-.20	-.14	-.07	-.18	.16	.14	.28	.01
SFS-R	SZ	19	-.17	-.03	-.10	-.12	-.29	-.20	-.29	-.28
	HC	17	.15	.44	.37	.03	-.05	.11	.22	.38
SFS-P	SZ	19	.18	.38	.29	.10	-.002	.00	-.24	-.15
	HC	17	.26	.10	.23	-.13	.15	.12	.52*	.13
SFS-E/O	SZ	19	-.21	.01	-.08	-.05	.04	-.08	.06	-.05
	HC	17	.02	-.07	.04	.03	.13	.18	-.15	.07

Social Function Scale (Birchwood et al., 1990) subscales: SFS-W = social engagement/ withdrawal. SFS-Inter= interpersonal behaviors. SFS-Ip= Independence-performance. SFS-C= independence-competence. SFS-R= recreation. SFS-P= Prosocial. SFS-E/O= Employment/Occupation.

* $p < .05$

** $p < .01$