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Further Examination of Ambivalence in Relation to the Schizophrenia-Spectrum

Anna R. Docherty^{a,*}, Scott R. Sponheim^{b,c}, and John G. Kerns^d

^aVirginia Institute for Psychiatric and Behavioral Genetics, Virginia Commonwealth University, Richmond, VA 23220 USA

^bPsychology Service, Minneapolis Veterans Affairs Health Care System, Minneapolis, MN 55417 USA

^cDepartment of Psychiatry, University of Minnesota, Minneapolis, MN 55455 USA

^dDepartment of Psychology, University of Missouri-Columbia, Columbia, MO 65201

Abstract

It remains unclear whether ambivalence reflects genetic liability for schizophrenia-spectrum disorders. This study examined whether task-measured ambivalence is 1) increased in schizophrenia/schizoaffective disorder, 2) significantly associated with schizophrenia symptoms, and/or 3) increased in first-degree biological relatives of probands. Consistent with previous research, ambivalence was elevated in schizophrenia/schizoaffective probands and significantly related to current emotional state, but not to symptoms. Ambivalence was not elevated in relatives, suggesting that it may be unrelated to genetic liability. These results suggest that emotional state may differentially influence ambivalence across groups. Future research would benefit from examination of this question in a larger cohort.

Keywords

ambivalence; first-degree relatives; genetic; schizotypal; emotion

1. Introduction

Bleuler considered ambivalence (defined as “positive and negative [emotions] at one and the same time”, p. 53) to be one of the primary symptoms of schizophrenia (Bleuler, 1950,

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*Corresponding author: Virginia Institute for Psychiatric and Behavioral Genetics, Virginia Commonwealth University School of Medicine, Richmond, VA 23220, USA tel +1 808 828 8127, fax. +1 808 828 1471, ardocherty@vcu.edu.

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original work published 1911). Few studies have examined the extent to which ambivalence is related to schizophrenia, rather than simply to elevated neuroticism or negative affect. On questionnaires, people with schizophrenia report increased ambivalence, and so do people with depression (Raulin & Brenner, 1993). Depression and schizophrenia are highly co-occurring, with approximately 60% of people with schizophrenia meeting criteria for lifetime history of a depressive episode (Martin et al., 1985). We recently found that ambivalence in schizophrenia as measured by questionnaire was associated with depression and state-related negative emotion, but it was not significantly associated with schizophrenia symptoms (i.e., positive, negative, or disorganized; Docherty et al., 2014). It is possible that ambivalence might be more associated with emotional state than with genetic liability to schizophrenia. One important study used in-the-moment reports of emotional responses to standardized stimuli to measure ambivalence (Treméau et al., 2009). Ambivalence was operationalized as the average amount both of negative affect (NA) for positive stimuli and of positive affect (PA) for negative stimuli. Although schizophrenia patients and controls were similar in NA for negative pictures and PA for positive pictures, the schizophrenia group was elevated on the measure of ambivalence. To further test how ambivalence may be related to disease process, mechanisms, and dimensions of schizophrenia, the current study examined 1) whether ambivalence measured with in-the-moment reports of emotion to standardized task stimuli is increased in the schizophrenia-spectrum, 2) whether ambivalence measured this way is significantly associated with schizophrenia symptoms, and 3) whether it is increased in first-degree biological relatives of probands.

2. Methods

Participants completed the *Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I; First et al., 1996)* along with supplemental Medical History and Psychosis modules of the *Diagnostic Interview for Genetics Studies (DIGS; Nurnberger et al., 1994)* and a consensus process, via guidelines established by Leckman (1982) was used to determine Lifetime Axis I diagnoses. This involved a review of the *SCID-I*, symptom ratings, and patient medical history. Interviewer ratings of symptomatology in proband participants were made using the *Scale for the Assessment of Negative Symptoms (SANS; Andreasen 1981)* and the *Scale for the Assessment of Positive Symptoms (SAPS; Andreasen 1983)*, which are embedded in the DIGS. Clinical interviewers were trained to meet gold-standard rating consensus and were supervised by a licensed clinical psychologist (SRS).

Participants were 18-65 year old males and females without current drug abuse or dependence, or alcohol abuse or dependence within the last month as assessed by the *SCID*. Proband diagnosed with schizophrenia or schizoaffective disorder ($n = 34$; 28 males and 6 females), first-degree relatives ($n = 33$; 12 males and 21 females), and controls ($n = 25$; 15 males and 10 females) did not differ significantly in age or parental education, and the proband group had a higher proportion of male participants.

Twenty items from the *Positive and Negative Affect Schedule-Extended Form (PANAS-X; Watson & Clark, 1994)*, reflecting different negative and positive emotions, were administered during the initial stage of the protocol. Participants made ratings on a 1 (*very slightly/not at all*) to 5 (*extremely*) Likert scale.

The *Picture Rating Task* by Kerns et al. (2008) is a computer task designed to assess affect frequency and intensity, using the same positive and negative picture stimuli reported in Barrett et al. (2004). This task contained 16 positive, neutral, and negative pictures, and took approximately 8 minutes to complete. Sixteen different emotions were rated after each stimulus was presented. These included positive high arousal emotions (alert, elated, excited, and happy), positive low arousal emotions (calm, contented, relaxed, and serene), negative high arousal emotions (nervous, stressed, tense, and upset), and negative low arousal emotions (depressed, fatigued, lethargic, and sad).

3. Results

Following Tremeau et al. (2009), ambivalence was measured as both self-reported negative affect (NA) for positive pictures and self-reported positive affect (PA) for negative pictures. Means and standard deviations for ambivalence across the three groups are presented in Table 1. We found significantly greater ambivalence in the patient probands than in either relatives or controls (probands vs. controls: positive pictures $t[47]=3.33, p=.02, d=.97$; negative pictures $t[51]=2.40, p=.002, \text{Cohen's } d=.67$, probands vs. relatives: positive pictures $t[53]=2.61, p=.01, d=.72$; negative pictures $t[54]=2.80, p=.007, d=.76$). Relatives did not differ significantly from controls (positive pictures $t[56]=-0.28, p=.78, d=.08$ and negative pictures $t[56]=.55, p=.59, d=.15$). Non-parametric tests were also conducted due to evidence of heterogeneity of variance, though there were no significant outliers in the proband group, and this resulted in a lack of significant difference in negative picture ambivalence between probands and controls ($Z = -1.6, p = .12$).

Means and standard deviations for PANAS current PA and NA scores are also presented in Table 1. Probands and relatives had significantly increased negative affect relative to controls, but no significant differences in PA were observed between groups. Even though standard deviations were statistically higher in both the proband and relative groups, there were no obvious single outliers driving effects. Results of non-parametric tests did not substantively differ.

Both measures of ambivalence tended to be correlated with one another in each group. In all groups, NA for positive pictures was significantly correlated with PA for negative pictures (probands $\rho = .42, p < .05$, relatives $\rho = .58, p < .001$, and controls $\rho = .44, p < .05$). We then examined whether ambivalence was related to current emotional state and to schizophrenia symptoms. Similar to previous research with a different sample (Docherty et al., 2014), in patient probands ambivalence was related to current emotional state: specifically, increased NA to positive pictures was significantly positively associated with current state NA and increased PA to negative pictures was significantly positively associated with current state PA. In contrast, ambivalence was unrelated to schizophrenia symptoms as measured by the SANS/SAPS (total SANS score ρ s = .06 for NA ambivalence and .13 for PA ambivalence; total SAPS score ρ s = -.07, -.13, respectively). Individual symptoms also largely failed to be associated with either measure of ambivalence (p -values $\geq .2$, except reduced hygiene/grooming with NA for positive pictures, $\rho = .48, p < .05$).

4. Discussion

Consistent with previous research, this study found elevations in task-measured ambivalence in schizophrenia. There is preliminary evidence that ambivalence is unrelated to genetic liability for schizophrenia since biological relatives exhibit normative levels of ambivalence. However, relatives' increased negative emotional state is noteworthy; for example, ambivalence may occur in attenuated form in relatives, and may present differently in relatives than in probands. Future research would benefit from further examination of negative affect and ambivalence in first-degree relatives.

Within the schizophrenia sample task ambivalence was strongly associated with current emotional state and generally unrelated to schizophrenia symptoms as measured by the SANS/SAPS. Results are consistent with recent evidence that self-reported questionnaire-assessed ambivalence in schizophrenia-spectrum disorders is associated with current negative mood but not with schizophrenia symptoms (Docherty et al., 2014). These results should be interpreted cautiously, however: SANS/SAPS scores are based on interviewer ratings, while emotional state and task measures ultimately rely on self-report. This could introduce potential method variance. Indeed, self-reported schizotypal personality traits may be more sensitive to associations of ambivalence with schizophrenia symptoms.

One interpretation of the results is that current emotional state of people with schizophrenia may dominate the appraisal of affective stimuli, perhaps due to underlying cognitive factors that limit directing attention to task-relevant stimuli (e.g., decreased executive control of attention). Future research would benefit from replication of these findings in a larger cohort, and with a depressed psychiatric control group.

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References

- Andreasen, NC. Scale for the assessment of negative symptoms (SANS). Iowa City: University of Iowa College of Medicine; 1984.
- Andreasen, NC. Scale for the assessment of positive symptoms (SAPS). Iowa City: University of Iowa College of Medicine; 1984.
- Barrett LF. Feelings or words? Understanding the content in self-report ratings of experienced emotion. *J Personality & Soc, Psychol.* 2004; 87:266–281.

- Bleuler, E. *Dementia praecox or the group of schizophrenias*. Zinkin, J., translator. New York: International Universities Press; 1950. Original work published 1911
- Docherty AR, Cicero DC, Becker TM, Kerns JG. Self-reported ambivalence in schizophrenia and associations with negative mood. *J Nervous & Mental Dis.* 2014; 202(1):70–73.
- Kerns JG, Docherty AR, Martin EA. Social and physical anhedonia and valence and arousal aspects of emotional experience. *J of Abnormal Psychol.* 2008; 117:735–746.
- First, MB.; Spitzer, RL.; Gibbon, M.; Williams, JBW. *Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Patient Edition. (SCID-I/P)*. New York: Biometrics Research, New York State Psychiatric Institute; Nov. 2002
- Martin RL, Cloninger CR, Guze SB, Clayton PJ. Frequency and differential diagnosis of depressive syndromes in schizophrenia. *J Clin Psychiatry.* 1985; 46:9–13. [PubMed: 2865255]
- Nurnberger JI Jr, Blehar MC, Kaufmann CA, et al. Diagnostic Interview for Genetic Studies: Rationale, Unique Features, and Training. *Arch Gen Psych.* 1994; 51(11):849–859.
- Raulin, ML.; Brenner, V. Ambivalence. In: Costello, CG., editor. *Symptoms of Schizophrenia*. New York: Wiley; 1993. p. 201-226.
- Treméau F, Antonius D, Cacioppo JT, Ziwich R, Jalbrzikowski M, Saccente E, Silipo G, Butler P, Javitt D. In support of Bleuler: objective evidence for increased affective ambivalence in schizophrenia based upon evocative testing. *Schiz Res.* 2009; 107(2-3):223–231.
- Watson, D.; Clark, L. *Manual for the Positive and Negative Affect Scale - Extended Form*. Iowa City, IA: University of Iowa; 1994.

Table 1
Means and Standard Deviations of Ambivalence Scores Across Groups

	Probands	Relatives	Controls	d ₁	d ₂
<i>Ambivalence</i>					
NA for Positive Pictures	46.4 (40.2) ^{bc}	23.9 (23.6)	20.9 (16.6)	.83	.15
PA for Negative Pictures	70.3 (42.9) ^{ac}	48.1 (24.6)	49.9 (21.7)	.60	-.08
<i>Current Mood</i>					
PANAS NA	15.0 (6.6) ^{ad}	12.6 (4.1) ^b	10.8 (1.2)	.89	.60
PANAS PA	33.9 (9.6)	32.9 (8.1)	33.0 (6.7)	.11	.11

Note: d₁ = Cohen's *d* effect sizes for differences between probands and controls, d₂ = Cohen's *d* effect sizes for differences between relatives and controls, PA = positive affect, NA = negative affect

^a = differ from controls, $p < .005$

^b = differ from controls, $p < .05$

^c = differ from relatives, $p < .01$

^d = differ from relatives, $p < .10$

Table 2
Associations between Task Ambivalence and Current Mood Across Groups

	<i>Current Mood</i>					
	Probands		Relatives		Controls	
	NA	PA	NA	PA	NA	PA
<i>Ambivalence</i>						
Positive Pictures	.37*	.20	.33 [†]	.25	.13	-.09
Negative Pictures	.23	.48**	.33	.40* ^γ	.39 [†]	-.06

Note. NA = PANAS current negative mood, PA = PANAS current positive mood.

[†] $p < .10$.

* $p < .05$.

** $p < .01$.

^γ Correlation of mood and ambivalence not significantly different from the same correlation in controls, at $\alpha = .05$.