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On the boundaries of blunt affect/alogia across severe mental illness: Implications for Research Domain Criteria

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ABSTRACT

There is growing awareness that reduced expressive behaviors (e.g., blunt affect, alogia, psychomotor retardation) are characteristic of a range of psychiatric conditions, including mood and schizophrenia-spectrum disorders. From a Research Domain Criteria (RDoC) perspective, it would be critical to determine whether these symptoms manifest similarly across diagnostic groups — as they may share common pathophysiological underpinnings. The present study employed computerized acoustic analysis of speech produced in reaction to a range of visual stimuli in 48 stable outpatients with schizophrenia and mood disorders to offer preliminary understanding of this issue. Speaking assessments were administered 1 week-apart to examine how temporal stability might vary as a function of clinical diagnosis and symptom severity. Speech characteristics generally did not differ between groups and were similarly, and for the most part, highly stable over time. Aspects of speech were significantly associated with severity of psychosis and negative symptoms, but not with clinical depression/anxiety severity. Moreover, stability of speech characteristics generally did not vary as a function of diagnostic group or clinical severity. The magnitudes of group differences were almost exclusively in the negligible to small range. Speech production was associated with social functioning deficits. In sum, these preliminary data suggest that speech variables tap a stable and clinically important facet of psychopathology that cut across diagnostic categories. Computerized acoustic analysis of speech appears to be a promising method for understanding the pathological manifestation of these variables.

1. Introduction

There is growing awareness that psychopathological processes transcend psychiatric diagnoses. Of note, genetic, molecular, anatomical, behavioral and subjective pathological phenomena are rarely constrained to a single psychiatric disorder. The Research Domain Criteria (RDoC), advanced by the National Institute of Mental Health (NIMH), is a novel approach to understanding psychopathology that focuses on the discovery of identifiable subtypes across rather than within mental disorders (Insel et al., 2010). Initial efforts have focused on five broad clinical phenotype categories (e.g., negative valence systems, cognitive systems). The present study sought to complement this effort by conducting a preliminary evaluation of a novel domain, involving a reduction in expressive behavior, as a potential Research Domain Criteria for severe mental illness.

A reduction in expressive behaviors appears to be a prominent feature of a range of severe psychiatric conditions. Observable as blunt/flat affect, alogia, or psychomotor retardation in clinical form, or constricted affect in subclinical form, these expressive deficits are diagnostic criteria of both major depression and schizophrenia-spectrum disorders (American Psychiatric Association (APA), 1994). Moreover, expressive deficits are a component of schizotypy — defined as the personality organization reflecting a putatively genetic vulnerability to schizophrenia-spectrum disorders thought to occur in approximately 10% of the population (Meehl, 1962; Collins et al., 2005; Cohen and Hong, 2011). To date, expressive deficits have been primarily studied in the context of schizophrenia negative symptoms. However, growing empirical attention has been paid to their presence in major depression as well. Interestingly, several studies have provided evidence that severity of clinically-rated blunted affect is similar in schizophrenia and major depression (Kulhara and Chadda, 1987; Tremeau et al., 2005). Expressive deficits are also relatively stable and associated with a host of deleterious variables, including poor functioning and prognosis in individuals with schizophrenia-spectrum disorders (Fenton and McGlashan, 1991; Mueser et al., 1994; Gur et al., 2006) and major depression (Parker et al., 1992). Moreover, clinically-rated blunted affect has been similarly related to social skill deficits for both disorders (Herbener and Harrow, 2004; Mueser et al., 2010), suggesting that expressive deficits have common pathological sequelae in these two disorders.

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As yet, our understanding of expressive characteristics is limited, in large part, due to the reliance on Likert-type clinical rating scales (e.g., SANS; Andreasen, 1984) for measurement. These instruments are not ideal for understanding expression due to their restricted scoring range and their use of vaguely defined anchors within an ordinal response format (Lader, 2000; Alpert et al., 2002; Cohen et al., 2008). For the past 7 years, our laboratory has been employing computerized acoustic analysis of natural speech to improve the understanding of expressive deficits. The use of a sensitive analytic approach that is behaviorally-based offers improved sensitivity and reliability over clinical rating scales (Lader, 2000; Alpert et al., 2002; Cohen et al., 2008). The primary aim of this project was to examine patients with psychotic, depressed and manic symptoms in acoustic-based measures of expressivity. We analyzed natural speech procured from a wide range of affectively-valenced speaking tasks, administered across two testing sessions scheduled a week apart. We used our computer-based technology in patients to answer the following questions: 1) To what degree are speech characteristics stable over a week epoch? 2) To what degree do speech characteristics reflect clinical state (i.e., anxiety/depression, psychosis or mania) or diagnostic history (i.e., history of Bipolar I, depression, psychosis), and how does this stability differ between patients with schizophrenia and those with mood disorders? 3) Across patients, to what degree are speech characteristics associated with social functioning deficits?

2. Methods

2.1. Subjects

Subjects were outpatients at a community mental health hospital (n = 48). These subjects included 26 patients with Diagnostic and Statistical Manual of Mental Disorders 4th edition (DSM-IV; APA, 1994) diagnosed schizophrenia and 22 patients with a history of a DSM-IV major depressive episode without a history of schizophrenia-spectrum disorder. Note that 10 of the individuals in the mood disorder group also met criteria for a manic episode at some point in their lives. Thus, 45% of the mood disorder sample met criteria for bipolar disorder, whereas 55% met criteria for unipolar major depressive disorder. Demographic and clinical information is provided in Table 1. Diagnoses were made based on information obtained from the patients' medical records and from a structured clinical interview (SCID; First et al., 1996). Exclusion criteria included: a) a Global Assessment of Functioning rating (GAF; APA, 1994) below 30, indicating a level of impairment that could interfere with participation in the study, b) documented evidence of intellectual disability from the medical records, c) current or historical DSM-IV diagnosis of alcohol or drug abuse suggestive of severe physiological symptoms (i.e., delirium tremens, repeated loss of consciousness), and d) history of significant head trauma (requiring overnight hospitalization). All patients were clinically stable (GAF score > 30) at the time of testing and were receiving pharmacotherapy under the supervision of a multi-disciplinary team. Patients received $40 for participation in this study. This study was approved by the appropriate Human Subject Review Boards and all participants offered informed consent prior to participating in the study. For additional information about recruitment, subjects and methods, the reader is referred to Cohen et al. (under review).

2.2. Diagnostic and symptom ratings

The Brief Psychiatric Rating Scale (BPRS; Lukoff et al., 1986) was selected to characterize patients' symptoms for this study because it is a broad measure of psychopathology. BPRS ratings were based on information obtained from medical records, the patients' treatment teams, and self-report and behavioral observations made during the research interview. Factor subscale scores reflecting positive (i.e., bizarre behavior, suspiciousness, unusual thought content, disorientation, and hallucination items), negative (i.e., self-neglect, blunted affect, motor retardation, and emotional withdrawal items), depression–anxiety (i.e., depression, guilt, suicidality, and anxiety items), and mania/excitement (i.e., motor hyperactivity, elevated mood, excitement, distractibility, hostility, and grandiosity items) symptoms (defined in Ventura et al., 2000) were employed here. Preliminary diagnoses and ratings were made by one of four doctoral level students who were trained to criterion (Intra-class Correlation Coefficient (ICC) values > .70). All diagnoses and ratings were videotaped and reviewed during a case conference meeting that was led by a licensed clinical psychologist with considerable diagnostic experience (Alex S. Cohen), and were recorded only when full agreement by the case conference members was made.

Table 1
Descriptive statistics for demographic and clinical variables for the mood disorder and schizophrenia groups.

	Mood disorder group (n = 22)		Schizophrenia group (n = 26)	
% Caucasian	64% (n = 14)		35% (n = 9)	
African-American	36% (n = 8)		65% (n = 17)	
% Male	60% (n = 13)		62% (n = 16)	
Current medications [a]				
2nd generation antipsychotic	71% (n = 12)		76% (n = 19)	
1st generation antipsychotic	12% (n = 2)		16% (n = 4)	
Antidepressants	47% (n = 8)		40% (n = 10)	
Mood stabilizers	12% (n = 2)		32% (n = 8)	
Anticholinergics	6% (n = 1)		20% (n = 5)	
Psychiatric history				
Major depression	100% (n = 22)		46% (n = 12)	
Manic episodes	41% (n = 9)		27% (n = 7)	
Psychosis symptoms	27% (n = 6)		100% (n = 26)	
Current diagnoses				
Major depressive episode	20% (n = 5)		20% (n = 4)	
Manic episodes	9% (n = 2)		8% (n = 2)	
	Mean	SD	Mean	SD
Father's educational level	10.00	5.24	11.79	3.22
Number hospitalizations	4.23	4.69	4.55	4.80
GAF	51.05	8.97	47.50	9.44
SOFAS	52.33	8.70	50.11	10.02
Reading ability (WRAT)	55.72	9.04	53.16	7.94
Age	46.17	9.69	39.87	9.96
Brief Psychiatric Rating Scale factor scores:				
Mania/excitement	10.26	5.47	10.39	4.63
Negative	6.78	2.98	8.51	3.70
Positive	7.78	3.10	12.26	5.30
Depression/anxiety	12.27	5.18	10.31	5.13

[a] Note — missing data for 5 mood disorder and 1 schizophrenia patients.

2.3. Verbal achievement

To examine potential confounds associated with individual differences in verbal achievement, we administered the word reading subtest of the Wide Range Achievement Test 4th edition (WRAT-4; Wilkinson and Robertson, 2006) to participants.

2.4. Social functioning

Social functioning was measured using the Social and Occupational Functioning and Assessment Scale (SOFAS) from the DSM-IV (APA, 1994), a scale from 1 to 100 reflecting social and occupational functioning during the prior month.

2.5. Speech tasks

Participants were asked to verbalize their reactions to pictures from the International Affective Picture System (IAPS; Lang et al.,