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Negative symptoms in psychometrically defined schizotypy: The role of depressive symptoms

Timothy R. Campellone*, Ori Elis, Jasmine Mote, Amy H. Sanchez, Ann M. Kring

Department of Psychology, University of California, Berkeley, 3210, Tolman Hall, Berkeley 94720-1650, CA, USA

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ABSTRACT

People high in schizotypy, a risk factor for schizophrenia-spectrum disorders, can have negative symptoms, including diminished experience of motivation/pleasure (MAP) and emotional expressivity (EXP). Additionally, people high in schizotypy often report elevated depressive symptoms, which are also associated with diminished MAP and EXP. In this study, we examined whether negative symptoms were related to schizotypy above and beyond the presence of depressive symptoms. Thirty-one people high in schizotypy and 24 people low in schizotypy were administered the Clinical Assessment Interview for Negative Symptoms (CAINS), an interview-based measure of MAP and EXP negative symptoms and completed a self-report measure of cognitive and somatic-affective depressive symptoms. People high in schizotypy had more MAP negative symptoms than people low in schizotypy, but we found no group differences in EXP negative symptoms. Importantly, the relationship between MAP negative symptoms and schizotypy was fully mediated by cognitive depressive symptoms. These findings suggest that depressive symptoms, specifically cognitive depressive symptoms, may be a pathway for motivation and pleasure impairment, in people at elevated risk for developing schizophrenia-spectrum disorders.

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1. Introduction

Schizotypy refers to a set of personality traits (e.g., unusual perceptions, social isolation, odd behavior) that represent a risk for schizophrenia-spectrum disorders (e.g. Lenzenweger, 2006). Similar to people with schizophrenia, people high in schizotypy can have deficits in the experience of motivation and pleasure or MAP (Yan et al., 2011; Fervaha et al., 2014) as well as emotional expressivity or EXP (Kerns, 2006; Cohen et al., 2009), which together represent the two broad domains of negative symptoms commonly found in people with schizophrenia (Blanchard and Cohen, 2006; Foussias and Remington, 2010; Kring et al., 2013). However, the relationship between schizotypy and negative symptoms is complicated by the fact that people high in schizotypy can also experience high levels of depressive symptoms (e.g. Lewandowski et al., 2006), which are also associated with both MAP and EXP (e.g., Gaebel and Wölwer, 2004; Sherdell et al., 2012). Thus, the primary goal of this study is to examine whether negative symptoms are related to schizotypy above and beyond the presence of depressive symptoms.

There are two broad approaches to the study of schizotypy. The multidimensional approach divides schizotypy into positive and negative dimensions, which largely map onto the phenomena captured by the positive and negative symptom domains of schizophrenia (Kwapil et al., 2008). Studies using the multidimensional approach investigate how elevations in positive and/or negative schizotypy dimensions differentially relate to variables of interest. The other approach, and the approach used in this study, focuses on schizotypy as a unifying construct. Schizotypy is unifying in the sense that it bridges the divide between people at low risk for the development of schizophrenia-spectrum disorders and people with a formal schizophrenia-spectrum diagnosis. In other words, rather than looking at elevations on positive or negative schizotypy dimensions, the unifying approach compares people high and low in schizotypy by selecting participants at the extreme ends of the schizotypy distribution in order to investigate risk factors for the development of schizophrenia-spectrum disorders. These two approaches are not mutually exclusive as studies can choose to stratify their participant recruitment on elevations on a particular schizotypy dimension. In this study, we chose to collapse across schizotypy dimensions to focus on people that were high or low in overall schizotypy traits.

Negative symptoms are an important area of inquiry in schizotypy for several reasons. First, the mechanisms that cause and maintain negative symptoms are poorly understood. Second, like for people with schizophrenia (e.g. Milev et al., 2005), negative symptoms have been linked to poorer quality of life for people high in schizotypy (Cohen and Davis, 2009). Third, negative

* Corresponding author.
E-mail address: tcampellone@berkeley.edu (T.R. Campellone).

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symptoms represent a critical unmet treatment need among people with schizophrenia (Buchanan, et al., 2010; Elis, Caponigro, & Kring, 2013). Investigating negative symptoms in people high in schizotypy may help increase and expand our understanding of potential mechanisms underlying MAP and EXP to the schizophrenia-spectrum more generally. Indeed, previous research has shown that people high in schizotypy (not just people high in negative schizotypy) self-report diminished MAP and EXP (e.g. Yan et al., 2011; Fervaha et al., 2014; Mitchell et al., 2015).

One important consideration in studying the relationship between negative symptoms and schizotypy is the potential contributions of depressive symptoms. Indeed, diminished pleasure is also a symptom of depression (DSM-5; American Psychiatric Association, 2013) and people with depressive symptoms can also have diminished emotional expressivity (e.g. Gaebel and Wölwer, 2004). Thus, elevations in negative symptoms may reflect an overlap with depressive symptoms (Kirkpatrick et al., 2006). Further, people high in schizotypy often have impairments in MAP and EXP as well as elevations in depressive symptoms, making it unclear whether negative symptoms are related to schizotypy above and beyond the presence of depressive symptoms. One approach to avoiding issues of such comorbidity has been to exclude participants who are elevated in both schizotypy (or a particular schizotypy dimension) and depression (e.g. Cohen et al., 2012). While this approach allows for the isolation of participants who are high in schizotypy without comorbid elevations in depressive symptoms, it does not resolve whether negative symptoms are associated with schizotypy alongside depression symptoms.

Although negative symptoms and depression are related, it may be the case that MAP and EXP negative symptoms are differentially related to particular depressive symptoms. For example, negative cognitive styles such as defeatist beliefs about the ability to perform activities, common among people with elevated depressive symptoms, have been linked to deficits in motivation/pleasure negative symptoms among people with schizophrenia (e.g. Green et al., 2012). Thus, motivation/pleasure negative symptoms in people high in schizotypy may be more related to cognitive depressive symptoms (e.g. thoughts of failure, defeat, and worthlessness) compared to somatic-affective symptoms (e.g., sadness, tiredness). By excluding people who report depressive symptoms in studies of schizotypy, researchers may be excluding people that possess potential mechanisms (e.g., defeatist beliefs) that contribute to negative symptoms in the broader schizophrenia-spectrum.

In this study, we sought to investigate whether schizotypy was related to negative symptoms above and beyond the presence of depressive symptoms. We recruited participants who were high or low in schizotypy–regardless of their depressive symptoms–in order to test several hypotheses. First, in line with previous research, we hypothesized that people high in schizotypy would have more negative (MAP and EXP) and depressive symptoms (cognitive and somatic-affective) than people low in schizotypy. Second, based on recent research highlighting the role of depressive cognitions in negative symptoms in schizophrenia (e.g., Green et al., 2012), we tested whether cognitive or somatic-affective depressive symptoms mediated the relationship between level of schizotypy and each negative symptom domain. Given the findings from research in people with schizophrenia, we hypothesized that cognitive depressive symptoms would mediate the relationship between schizotypy and motivation/pleasure negative symptoms. Because the link between EXP negative symptoms and specific depressive symptoms is less clear, we conducted exploratory analyses to examine whether specific depressive symptoms mediated the relationship between schizotypy and EXP negative symptoms.

2. Methods

2.1. Participants

Undergraduate students were invited to complete an online survey that contained demographic questions as well as the Schizotypal Personality Questionnaire, Brief Revised (SPQ-BR; Cohen et al., 2010), a 32-item questionnaire used for assessing schizotypy. We received 2832 participant responses to the survey over the course of 3 semesters. To identify participants for the high (HS) and low (LS) schizotypy groups, we selected participants that were two or more standard deviations above or below the mean SPQ-BR total score in a given semester and invited people who met the inclusion criteria to participate in the main study. Our approach of deriving a HS group by selecting participants two standard deviations above the mean is similar to previous approaches (e.g. Cohen et al., 2014). Given our interest in the relationship between levels of schizotypy, negative symptoms and depressive symptoms, we used a conservative approach to recruiting our LS group. That is, while studies typically apply less stringent selection criteria for the recruitment of LS groups (e.g., lowest 15% of schizotypy scores; Williams, Henry, & Green, 2007), our LS group was comprised of participants that were two standard deviations below the mean. Sampling the high and low extremes (top and bottom 5%) of the schizotypy distribution allowed us to better assess both the relationship between schizotypy and negative symptoms as well as whether this relationship might be better accounted for depressive symptoms. Specifically, this sampling approach allowed us to isolate how the presence or relative absence of schizotypy related to MAP and EXP negative symptoms and depressive symptoms. Our final sample included 31 people in the HS group and 24 people in the LS group (see Table 1 for demographic information).

2.2. Clinical assessment

2.2.1. Clinical Assessment Interview for Negative Symptoms (CAINS)

We measured negative symptoms with the Clinical Assessment Interview for Negative Symptoms (CAINS; Kring et al., 2013). Trained masters-level graduate students served as interviewers, who rated participants' engagement and interest in motivated

Table 1
Demographic information, clinical interview, and self-report data for the high schizotypal personality trait (HS) and low schizotypal personality trait (LS) groups.

	HS (n=31)	LS (n=24)	Comparison (t or χ^2)
Age (years)	20.45 (2.6)	20.08 (1.6)	$p=0.54$
% Male	23%	25%	$p=0.83$
Racial Background (%)			
Caucasian	12.9%	44.0%	$p=0.01$
Asian	54.8%	20.0%	$p=0.01$
Black	3.2%	8.0%	ns
Hispanic	9.7%	4.0%	ns
Other/Multiple races	19.4%	24.0%	ns
SPQ-BR			
Total	125.23 (7.5)	42.20 (3.7)	$p<0.01$
Positive	44.23 (15.2)	25.60 (13.6)	$p<0.01$
Negative	35.68 (11.6)	18.69 (12.1)	$p<0.01$
Disorganized	29.68 (9.7)	15.52 (8.4)	$p<0.01$
CAINS			
MAP scale	11.35 (5.6)	6.46 (3.8)	$p<0.01$
EXP scale	2.87 (2.9)	2.00 (2.6)	$p=0.27$
BDI-II			
Somatic-Affective	11.37 (4.8)	3.96 (1.9)	$p<0.01$
Cognitive	4.96 (4.0)	1.29 (2.0)	$p<0.01$

SPQ-BR=Schizotypal Personality Questionnaire, Brief Revised, CAINS=Clinical Assessment Interview for Negative Symptoms, MAP=Motivation and Pleasure, EXP=expressivity, BDI=Beck Depression Inventory.

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