# Revisiting the blurry boundaries of schizophrenia: Spectrum disorders in psychometrically identified schizotypes

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### ABSTRACT

Certain Personality Disorders (PDs) have been found to be present in the prodromal phase of schizophrenia at a higher rate than other personality disorders. Although schizotypal, paranoid, and schizoid PDs are traditionally viewed as spectra for schizophrenia, research suggests that avoidant PD should be included in this group (e.g., Fogelson et al., 2007). The present study examines whether a sample of psychometrically identified schizotypes (SZT) have higher incidence of schizophrenia-spectrum PDs, as well as more symptoms of these PDs, in general, than does a matched comparison (MC) sample. Eighty-five SZT and 78 MC participants were administered the *Personality Disorder Interview for DSM-IV (PDI-IV)* to assess PD symptoms and diagnoses. Results indicate that the SZT group evidenced significantly more symptoms of avoidant, schizoid, paranoid, and schizotypal PDs than did the MC group. Further, there were significant differences in the incidence of these PDs between the groups.

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## 1. Introduction

A long history of research into premorbid personality indicators has supported the notion that there are differences in individuals with increased liability to schizophrenia related illnesses (SRIs) compared to those without increased liability. For example, Bleuler, (1911/1950) noted that individuals who develop SRIs demonstrated oddities in personality from childhood and were likely to be withdrawn from others. Hoch (1910), noting a relationship between a detached personality type and schizophrenia development, referred to a "shut-in" personality. Likewise, Niemi et al. (2005) found that the presence of emotional problems and social inhibition in children predicted later psychotic symptoms.

As far back as the time of Kraepelin (1909/1971), it has been noted that symptoms of SRIs appear to aggregate within families, as relatives of individuals with the disorder exhibit a number of anomalies, including eccentric personality. Further, family studies of schizophrenia have indicated a relationship between schizo-

phrenia and personality disorders such as schizotypal personality disorder (Kendler et al., 1993; Asarnow et al., 2001; Hans et al., 2004). Certain personality disorders have also been found to be present in the prodromal phase of schizophrenia. Indeed, the "Cluster A" disorders (Schizotypal, Paranoid, and Schizoid) are viewed as being related to schizophrenia (Braff et al., 2007). For example, data from the New York High-Risk Project demonstrated that as many as 16–20% of schizophrenia offspring may develop "Cluster A" personality disorders (Erlenmeyer-Kimling et al., 1995).

Research, however, has suggested that avoidant personality disorder be included in this group of schizophrenia-related personality disorders. For example, Solano and De Chávez (2000) found that 85% of their sample of patients with schizophrenia had premorbid personality disorders, with avoidant (32.5%), schizoid (27.5%), paranoid (20%), dependent (20%), and schizotypal (12.5%) were the most common; they noted, however, that the generalizability of their findings may be limited by their relatively small ($N=40$) sample. Likewise, Keshavan et al., 2005 found that "Cluster C" dimensional scores on a semi-structured personality interview schedule, particularly avoidant personality scores, were higher for patients with schizophrenia than for patients with non-schizophrenia psychoses or healthy participants. Such findings have been extended to individuals deemed to be at risk for schizophrenia, as Fogelson et al.

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(2007) have demonstrated that a relations exists between avoidant personality disorder and liability to schizophrenia even after statistically accounting for paranoid and schizotypal personality disorders, a finding that was supported by Gooding et al. (2007). Bolinskey and Gottesman (2010) found higher rates of reported avoidant personality disorder symptoms among individuals classified as hypothetically psychosis prone compared to a matched control sample, although their study relied on self-report of symptoms. Fogelson et al. (2010) have extended these findings into the neurocognitive realm by demonstrating that avoidant personality disorder symptoms can predict performance on neurocognitive measures associated with schizophrenia liability even after accounting for symptoms of other spectrum disorders. This link between avoidant personality and the schizophrenia spectrum is not surprising given the similar patterns of social withdrawal witnessed among the disorders; indeed (Millon, 1990; Millon et al., 2004) have conceptualized schizoid, schizotypal, and avoidant personalities as falling in the detached interpersonal spectrum, with schizoid personality reflecting an entirely passive adaptation style, avoidant personality reflecting an active adaptation style, and schizotypal reflecting a mixed adaptation style.

### 1.1. Schizotypy

Our concept of schizotypy has largely developed as a result of observations by individuals such as Kraepelin (1909/1971) and Rado (1953) who described individuals demonstrating schizophrenia-like, but non-psychotic symptoms. Rado offered the term *schizotype* as a condensation of *schizophrenic phenotype* to refer to these individuals and the term *schizotypy* to refer to the presence of the characteristics. He suggested that individuals with schizotypy have the genetic potential to develop overt signs and symptoms of schizophrenia. Meehl (1962, 1990) further refined the concept of schizotypy and suggested that liability to schizophrenia is associated with a number of characteristics including personality disturbance – which includes anhedonia, interpersonal aversiveness, and ambivalence – and cognitive slippage. Since the time of such observations, and with the advancement of psychological research, experimental psychopathologists have demonstrated that a meaningful relationship exists between schizotypic psychopathology and liability to schizophrenia (Lenzenweger, 2010). Thus, the presence of schizotypy can be used as an indicator of increase liability to SRIs. For example, the Maryland Longitudinal Study of Schizotypy (Blanchard et al., 2011) demonstrated that a community sample of individuals who reported social anhedonia had a greater number of schizophrenia-spectrum personality disorder characteristics, greater negative symptom characteristics, and lower global functioning than a healthy comparison sample. This finding serves to underscore the utility of schizotypy measurement as an indicator of schizophrenia related pathology.

#### 1.1.1. Assessing schizotypy

Schizotypy can be identified clinically, which entails the assessment of psychiatric schizotypic psychopathology (Gooding et al., 2005; Lenzenweger, 2006). This identification could come from a diagnosis of one of the disorders in the schizophrenia spectrum, such as schizoid, paranoid, or schizotypal or avoidant personality disorder, all of which reflect a schizotypic personality organization and an increased level of underlying schizotypy. This method of identification represents the foundation of our understanding of schizotypy. One benefit to this method of liability identification is that it acknowledges that liability to SRIs is seen as continuous in nature, rather than a categorical identification, which allows clinicians to describe the severity of symptomology with an appropriate diagnosis.

Schizotypy can also be identified using reliable and valid psychometric measures that indicate liability to schizophrenia (Lenzenweger, 2006). With increased interest in identifying schizotypy, additional

psychometric measures have been developed explicitly for this purpose. Among measures found to be effective in identifying psychosis-proneness, or schizotypy, are the Chapman Psychosis Proneness Scales (CPPS), which include the Perceptual Aberration Scale (*PerAb*; Chapman et al., 1978) which measures unusual sensory experiences, the Magical Ideation Scale (*MagId*; Eckblad and Chapman, 1983) which measures unconventional belief systems, and the Revised Social Anhedonia Scale (*SocAnh*; Eckblad et al., 1982) which measures lack of desire for social engagement, among others. Studies have found higher incidence of SRP among individuals identified as schizotypic on the basis of CPPS scores relative to comparison groups at 10 year follow-up (Chapman et al., 1994; Kwapil, 1998), as well as more frequent and severe psychotic-like experiences at 5 year follow-up (Gooding et al., 2005; 2007). Lenzenweger, 1991; Lenzenweger and Korfine, 1992) found that high scores on *PerAb* were associated with schizotypic MMPI profiles. Lenzenweger and Loranger (1989b) found that high scores on *PerAb* were related not only to higher schizotypal and paranoid personality disorder symptoms in psychiatric patients, but to increased family loading for liability to schizophrenia, as well (Lenzenweger and Loranger, 1989a). Further, Lenzenweger (2014) has recently reported that at a 17-year follow-up of schizotypes from the Cornell Young Adult Development Study, higher *PerAb* scores at baseline (with no prior history of psychosis in any subject) were significantly associated with elevated schizotypal, paranoid, and avoidant PD symptoms, assessed using the International Personality Disorder Screener (IPDE-S; Lenzenweger et al., 1997); elevated total Schizotypal Personality Questionnaire (SPQ; Raine, 1991), SPQ-reality distortion, and SPQ-disorganization scores; and with higher levels of hallucinatory and delusional features, as assessed using the SCID-B Psychosis Module.

Thus, there is adequate evidence to support the utility of the CPPS in identifying schizotypic individuals well before the onset of clinically significant symptoms. This is especially important as although the single best predictor of developing SRP remains having an identical twin with the disorder (Meehl, 1990), it has been noted that 45% of individuals determined to be at risk via psychometric means had no family history of psychosis (Chapman and Chapman, 1985), which suggests that reliance on genetic relatedness for determination of increased liability to SRP may lead researchers to overlook a significant subset of individuals having increased liability, but no family history of the disorder. An additional benefit of the CPPS is that they are intended to measure liability to SRP in a population of sub-threshold individuals who are unlikely to exhibit overt symptoms of psychosis, and in some cases may have no easily observable signs of schizotypy. By investigating liability factors in this population, investigators may be more likely to detect aspects of the disorder that may be obscured in the fully decompensated illness (Lenzenweger, 2010).

### 1.2. Present study

The current study examined the relationship between psychometrically-identified schizotypy and spectrum personality disorders in a sample of college students who have never met diagnostic criteria for schizophrenia, or a related psychotic disorder. Given that the results of previous research have consistently presented two findings: A) these disorders are truly associated with liability to schizophrenia, and B) the CPPS identifies individuals with increased liability to schizophrenia, two hypotheses were indicated. Specifically, we hypothesized the following:

1. Individuals who were identified as schizotypic would endorse a greater number of symptoms of spectrum personality disorders, regardless of whether they met diagnostic criteria, than would a matched comparison sample of non-schizotypes.