

Schizotypal ambivalence is associated with schizophrenia-spectrum and borderline personality traits in young adults: Converging results from three interview studies

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Abstract:

Ambivalence has a longstanding history in schizophrenia-spectrum and borderline personality psychopathology, although it has been largely overlooked in current psychopathology research. The Schizotypal Ambivalence Scale (SAS) provides a brief, psychometrically sound questionnaire for assessing ambivalence characteristic of the schizotypy spectrum. We conducted three interview studies examining associations of the SAS with impairment, schizophrenia-spectrum psychopathology, borderline personality disorder, and mood disorders in independent samples of young adults (n 's = 57, 151, 162). Despite being conducted in different regions with differing designs, results showed good convergence across the three studies. SAS scores were robustly associated with impairment, schizophrenia-spectrum psychopathology and personality traits, and borderline personality traits (typically medium effects). Furthermore, significant associations of the SAS with the interview-outcome measures remained after partialling variance associated with neuroticism. The results support the construct validity of schizotypal ambivalence and the SAS. Recommendations for future study are provided.

Keywords: Schizophrenia-spectrum | Schizotypy | Schizotypal ambivalence | Personality disorders

Article:

1. Introduction

The psychiatric literature from the first half of the twentieth century was replete with descriptions and diagnoses of schizophrenic-like conditions. These came under various appellations such as “ambulatory schizophrenia,” “preschizophrenic personality structure,” and “pseudoneurotic schizophrenia,” and were often referred to under the grand heading of “the borderline conditions” (e.g. Gunderson & Singer, 1975; Hoch & Polatin, 1949; Zilboorg, 1941).

Spitzer, Endicott, and Gibbon (1979) argued that individuals commonly labeled with “borderline” diagnoses fell into two related but distinct groups: one characterized by chronic instability of affect, relationships, and identity, and a second with symptoms resembling prodromal schizophrenia. The pathological characteristics of these groups became the criteria for borderline and schizotypal personality disorders, respectively, in the third edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1980). Though they became separate diagnoses, these disorders retain a high comorbidity rate as well as similar characteristics (American Psychiatric Association, 2022). In fact, studies have reported rates of comorbidity of schizotypal and borderline personality disorder ranging from 33 to 91 % (e.g., Siever, Bernstein, & Silverman, 1991; Zimmerman, Rothschild, & Chelminski, 2005).

One of the common features of these diagnoses is ambivalence. Bleuler (1911/1950) coined the term ambivalence to describe a tendency to experience divergent emotions toward situations, objects, or people simultaneously (e.g., intense love and hatred for a person). Bleuler argued that ambivalence was one of the four fundamental symptoms of schizophrenia that are present in every patient with the disorder. Meehl (1962) initially described ambivalence as one of the four core symptoms of schizotypy (the personality organization presumed to underlie the risk for schizophrenia). Similarly, Parnas and colleagues, following Bleuler and Meehl, included ambivalence in their conceptualization of anomalous self-experiences (e.g., Parnas et al., 2005; Parnas & Henriksen, 2014).

Historically, ambivalence has been more strongly associated with the intra- and interpersonal instability characteristics of borderline personality disorder (Kernberg, 1967, 1970) than with schizophrenic-like functioning. Kernberg (1977) vividly described the simultaneous experience of, and rapid fluctuating between, opposite emotions that characterized Bleuler’s ambivalence, but he referred to these emotional shifts as “splitting.” Furthermore, he argued that splitting was a defense mechanism that permitted borderline individuals to maintain their psychiatric equilibrium. This is in sharp contrast to Bleuler, who believed that ambivalence represented thought disorder due to a “splitting of associative threads.” Thus, even though ambivalence played an important role in the conceptualizations of schizophrenia-spectrum and borderline psychopathology, there has been little work simultaneously examining the relationship of ambivalence with both areas of psychopathology.

Two forms of ambivalence have been described in the literature (Conner & Sparks, 2002; Stocker, 1990). Diachronic ambivalence involves fluctuations between opposing ideas, whereas synchronic ambivalence is characterized by the simultaneous experience of positive and negative attitudes. Diachronic ambivalence appears consistent with features of borderline personality disorder and depression. Synchronic ambivalence, which features simultaneous, antithetical, and poorly integrated cognition and emotions, appears to be characteristic of schizotypy and the schizophrenia spectrum (Raulin & Brenner, 1993), as well as with ambivalence characterizing anomalous self-experiences (e.g., Parnas et al., 2005). This is consistent with Bleuler’s view that ambivalence in schizophrenia is a manifestation of thought disorder and may indicate an inability to inhibit negative emotions, even during the experience of positive emotions (Cohen, Minor, & Najolia, 2010; Horan, Green, Kring, & Nuechterlein, 2006).

Research over the past four decades has focused on refining the psychometric assessment of ambivalence. Raulin (1984) developed the 45-item Intense Ambivalence Scale to assess ambivalence characteristic of schizophrenia and schizotypy based on the detailed descriptions provided by Meehl (1964) in his Checklist of Schizotypic Signs. However, Raulin (1984) found that the ambivalence measured by this questionnaire not only characterized patients with

schizophrenia, but was actually more elevated in psychotically depressed patients. Kwapil, Raulin, and Midthun (2000) found that this scale was associated with psychotic-like experiences, depressive symptoms, and substance abuse, suggesting that it identifies ambivalence associated with a more general risk for psychopathology.

Raulin (1986) developed the revised Schizotypal Ambivalence Scale (SAS), a questionnaire designed to be more specific to the ambivalence found in schizophrenia. The SAS items had a matter-of-fact tone and emphasized “the simultaneous experience of contradictory emotions or the rapid and almost random change of emotions over time.” The SAS omitted items from the Intense Ambivalence scale endorsed by psychotically depressed patients that tapped alternation from positive to negative feelings. The SAS contains 19 true–false items.

Preliminary research has shown that the SAS has good internal consistency (coefficient alpha = 0.84 in 1,798 young adults) and test–retest (0.74 across nine weeks in 166 young adults) reliabilities (Mann, Vaughn, Barrantes-Vidal, Raulin, & Kwapil, 2008). Using item response theory and differential item functioning methods, Deters, Silvia, and Kwapil (2022) reported that the SAS exhibits essential unidimensionality and that SAS items have good discrimination and do not exhibit bias across gender. Preliminary interview studies indicated that the SAS identifies individuals who exhibit both positive and negative schizophrenic-like symptoms and impaired overall functioning (Kwapil, Mann, & Raulin, 2002; Mann et al., 2008). Unlike the Intense Ambivalence Scale, the SAS showed little relation to depression or substance use, suggesting that the SAS may be more specifically associated with schizophrenic-like functioning than general psychopathology.

Consistent with its operationalization as a measure of schizotypic features, the SAS is associated with widely used measures of schizotypy. Mann et al. (2008) reported that the SAS correlated 0.50 with the Perceptual Aberration Scale (Chapman, Chapman, & Raulin, 1978), 0.47 with the Magical Ideation Scale (Eckblad & Chapman, 1983), 0.45 with the Revised Social Anhedonia Scale (Eckblad, Chapman, Chapman, & Mishlove, 1982), and 0.18 with the Physical Anhedonia Scale (Chapman, Chapman, & Raulin, 1976) in a sample of 1,798 young adults. MacAulay, Brown, Minor, and Cohen (2014) reported that SAS scores correlated 0.33 with the cognitive-perceptual, 0.27 with the interpersonal, and 0.24 with the disorganized factors of the Schizotypal Personality Questionnaire (Raine, 1991) in 1,379 young adults. Additionally, unpublished results from our laboratory from 551 young adults found that the SAS was correlated 0.49 with the positive schizotypy factor, 0.38 with the negative schizotypy factor, and 0.66 with the disorganized schizotypy factor of the Multidimensional Schizotypy Scale (Kwapil, Gross, Silvia, Raulin, & Barrantes-Vidal, 2018).

(Kwapil, Gross, Silvia, Raulin, & Barrantes-Vidal, 2018). Burgin, Chun, Horton, Barrantes-Vidal, and Kwapil (2015) examined the expression of schizotypal ambivalence in the daily lives of 430 young adults using experience sampling methodology. They reported that schizotypal ambivalence was associated with diminished positive affect, increased negative affect, and cognitive and social impairment. Furthermore, schizotypal ambivalence was associated with heightened reactivity to social stress. However, studies to date have not examined the relationship of scores on the SAS with borderline personality traits.

1.1. Goals and hypotheses of the present studies

The goal of the present studies was to comprehensively assess the association of schizotypal ambivalence with interview measures of symptoms and impairment in three

independent, nonclinical samples of young adults. These studies included interview outcome measures of positive, negative, and disorganized schizotypic experiences, schizotypal, schizoid, paranoid, and borderline personality disorder traits, mood disorders, and general levels of functioning. Consistent with the findings of previous interview studies (Kwapil et al., 2002; Mann et al., 2008), it was hypothesized that the SAS would be associated with schizotypic experiences, schizophrenia-spectrum personality disorder traits, and impaired functioning. Furthermore, it was hypothesized that the SAS would be associated with borderline personality disorder traits. Note that the three interview studies differ in terms of the time period, the use of extreme group vs continuous measures of schizotypal ambivalence, and the specific composition of interview outcome measures. We believe that these differences represent a strength as they provide a more comprehensive assessment of the SAS. Given that we conducted three independent studies with distinct designs and measures, we opted not to attempt to combine all the participants into a single sample. Furthermore, we were interested in examining the degree to which findings replicated across the three studies (as well as the earlier interview studies by Kwapil et al. [2002]; Mann et al. [2008]) given the widely documented replication crisis in psychology (e.g., Diener & Biswas-Diener, 2019).

Previous studies found that scores on the SAS are strongly associated with the personality dimension of neuroticism. Cicero and Kerns (2010) reported a correlation of 0.46 in 325 young adults, and unpublished findings from our lab based on 7,096 young adults found a correlation of 0.54. This is not surprising given that both schizotypal ambivalence and neuroticism involve difficulty regulating emotions. However, it raises questions about whether the findings for schizotypal ambivalence may be better accounted for by neuroticism. Therefore, in studies 2 and 3, we examined the bivariate associations of SAS scores with our interview outcome measures, as well as the associations after partialling variance associated with neuroticism.

2. Study 1

2.1. Method

2.2.1. Participants

Following Chapman, Chapman, Kwapil, Eckblad, and Zinser (1994), Study 1 employed an extreme group design. Participants included 26 University of North Carolina at Greensboro undergraduate students with standard scores of at least +1.96 on the SAS (ambivalence) group and 31 control participants with standard scores of less than +0.5 on the scale assessed from 2003 to 2005. Note that Mann et al. (2008) reported large effect sizes for the comparisons of their SAS and control groups on interview ratings of psychopathology and impairment. Therefore, following Cohen (1992), the present study provided adequate power to detect such effects at an alpha level of 0.05 (two-tailed). The mean SAS Z-score was 2.26 (SD = 0.34) for the ambivalence group and -0.67 (SD = 0.53) for the control group. The groups did not differ on age (ambivalence group: M = 19.4 years, SD = 2.6; control group: M = 19.5 years, SD = 3.2) or sex composition (ambivalence group 65%F; control group: 74%F). The study was approved by the institution's IRB and complied with APA ethical standards.

2.1.2. Materials and procedure

The SAS contains 19 true–false items, such as “My thoughts and feelings always seem to be contradictory,” and “Often I feel like I hate even my favorite activities.” The SAS was administered as part of a departmental mass screening. SAS items were intermixed with a 13-item infrequency scale (Chapman & Chapman, 1983). Participants with elevated scores on the infrequency scale were not considered for the interview study.

2.1.2.1. Structured diagnostic. The interview contained modules of the International Personality Disorders Examination (IPDE; World Health Organization, 1995) that assess schizoid, paranoid, schizotypal, and borderline personality disorders. The IPDE produces both ratings of criteria met for DSM-IV diagnostic purposes and dimensional ratings of symptom severity for each of the disorders. The interview also included portions of the Structured Clinical Interview for DSM-IV (First, Spitzer, Gibbon, & Williams, 1995) that assess mood disorders, substance use, and demographic information. Mood episodes were coded as present or absent, while substance use and impairment were coded using the rating system described in Kwapil (1996). Overall functioning was rated using the Global Assessment of Functioning Scale (GAF; American Psychiatric Association, 2000). The GAF is rated from 1 to 100, with higher scores indicating superior functioning.

The interviews were conducted individually and in person. They were administered and scored by an advanced undergraduate student with extensive training in diagnostic interviewing. Ratings were reviewed by a licensed clinical psychologist, with scoring and diagnostic questions resolved by consensus. The interviewer and raters were blind to participants’ group membership. The diagnostic interviews lasted approximately-two hours and were audiotaped. Students received course credit for their participation.

2.2. Results and discussion

Data from all three interview studies are available on Open Science Framework. Table 1 presents comparisons of the ambivalence and control groups on measures of psychopathology and overall adjustment. The ambivalence group exceeded the control group on ratings of schizotypal, schizoid, paranoid, and borderline traits, and evidenced poorer overall adjustment as assessed by the GAF (all large effect sizes). One control group member (3 %) qualified for a diagnosis of paranoid personality disorder. None of the other participants met the criteria for a schizophrenia-spectrum personality disorder. Four (15 %) ambivalence group members and one (3 %) control group member met criteria for a diagnosis of borderline personality disorder (at least five criteria met), while another three (12 %) ambivalence group members met four of the five criteria needed for the diagnosis.

Consistent with previous interview studies (Kwapil et al., 2002; Mann et al., 2008), the SAS and control groups did not differ on ratings of alcohol or drug use or impairment (the mean ratings reflected minimal use and impairment in both groups). The groups did not differ significantly on the proportion of participants with a history of major depressive episodes, and none of the participants had experienced a manic or hypomanic episode.

Consistent with Kwapil et al. (2002) and Mann et al. (2008), high scorers on the SAS exceeded control participants on interview-based ratings of schizophrenia-spectrum personality disorder traits and exhibited impaired functioning. Likewise, the study replicated the findings of

no group differences on depressive or manic/hypomanic mood episodes or ratings of substance use and impairment. Consistent with ambivalence’s central role in the conceptualization of borderline personality disorder, the study found that the ambivalence group exceeded the comparison group on interview-based ratings of borderline personality traits. Furthermore, 27% of the ambivalence group met at least 4 criteria of borderline personality, indicating a probable or definite diagnosis. Note that all the hypothesized group differences represented large effect sizes.

Table 1
Comparison of the Schizotypal Ambivalence and Control Groups on Interview Measures of Psychopathology and Adjustment in Study 1.

	<u>Ambivalence</u>		<u>Control</u>		<u>t-value</u> (<i>df</i> = 55)	<u>Cohen’s <i>d</i></u>
	(n = 26)		(n = 36)			
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>		
Global Assessment of Functioning	66.5	(13.1)	78.1	(10.3)	3.75***	0.98
Schizotypal PD traits	2.9	(2.4)	0.8	(1.4)	3.87***	1.07
Schizoid PD traits	1.2	(1.7)	0.2	(0.4)	3.40**	0.81
Paranoid PD trait	2.1	(2.1)	0.5	(1.7)	3.25**	0.84
Borderline PD traits	5.7	(4.4)	2.0	(2.5)	3.89***	1.03
Alcohol Use	5.0	(5.8)	4.5	(6.5)	0.77	0.08
Alcohol Impairment	1.1	(0.9)	1.1	(1.1)	0.19	0.00
Drug Use	1.7	(2.2)	0.9	(2.4)	1.28	0.35
Drug Impairment	0.9	(1.2)	0.4	(0.9)	1.79	0.47
<u>Categorical Outcomes</u>					<u>Fishers Exact test</u>	
Major Depressive Episodes	27 %		19 %		0.54	
Manic Episodes	0 %		0 %		1.00	

p* < .05 *p* < .01; ****p* < .001.

3. Study 2

Given that schizotypal ambivalence is conceptualized as a dimensional trait and measured continuously by the SAS, Studies 2 and 3 examined the association of continuous SAS scores with interview measures of psychopathology and impairment (in contrast to the extreme groups design in Study 1). Specifically, the study examined the association of the SAS with ratings of schizotypal, schizoid, paranoid, borderline, and avoidant personality disorder traits, global functioning, and mood episodes. To examine the extent to which neuroticism may account for these associations, we examined both the bivariate associations of SAS with these interview outcome measures, as well as the association after partialling out variance associated with neuroticism.

3.1. Method

3.1.1. Participants

Participants were from the Kwapil et al. (2022) interview study of 151 young adults assessed at the University of Illinois at Urbana Champaign in 2019 and 2020 (prior to the COVID-19 pandemic lockdown). The sample size provided sufficient power to detect small effect sizes at alpha of 0.05. Participants for Studies 2 and 3 were recruited by two overlapping methods. Any

participant in the undergraduate subject pool of at least 18 years of age was allowed to sign up for the study. Additionally, we oversampled participants who scored at least 1.5 SD above the mean on the Multidimensional Schizotypy Scale-Brief (Gross, Kwapil, Raulin, Silvia, & Barrantes-Vidal, 2018) taken during a departmental prescreening. These procedures were employed to ensure that the sample included participants with a wide range of schizotypic traits. Demographic characteristics of the sample were: Mage = 19.3 years, SD = 1.1; 71%F/29%M. The study was approved by the institution's IRB and complied with APA ethical standards. Participants provided informed consent and received course credit for taking part in the study.

3.1.2. Materials and procedures

Participants completed the SAS intermixed with the Infrequency Scale, and the 12-item neuroticism subscale of the NEO-3-Five Factor Inventory (NEO-3-FFI; McCrae & Costa, 2010). No participants were omitted due to elevated infrequency scores. The interview battery included the schizoid, schizotypal, paranoid, borderline, and avoidant personality disorder modules of the IPDE. It also included the overview and mood disorder modules of the Structured Clinical Interview for DSM-5 Disorders (SCID-5; First, Williams, Karg, & Spitzer, 2015). Functioning was rated using the GAF.

After providing consent, participants completed the questionnaires (15 min) and semi-structured interviews (1-to-2 h). Interviews were conducted in-person by three trained assessors supervised by a licensed psychologist and were audio-recorded. A subset of 32% of the interviews was independently scored by two raters to assess interrater reliability. Scoring disagreements were resolved by consultation with the senior investigator. Interrater reliability was good to excellent (intraclass correlation or Kappa > 0.80 for all outcome measures). Interviewers and raters were unaware of participants' scores on the SAS or neuroticism measure.

3.2. Results and discussion

The mean standardized score on the SAS was 0.19 (SD = 1.03, range = -1.51 to 2.58, coefficient alpha = 0.84). Mean raw score on the NEO-3-FFI neuroticism scale was 37.3 (SD = 7.9, range = 17 to 56, coefficient alpha = 0.81). SAS and neuroticism correlated $r = 0.64$ (large effect size). Note that we did not report associations for neuroticism with outcome measures, as our interest in neuroticism was simply regarding whether the bivariate effects for the SAS remained after partialling variance associated with neuroticism.

Table 2 presents the correlations of the SAS with the quantitative interview measures (both bivariate correlations and after partialling neuroticism). SAS was significantly associated with impaired functioning (medium effect sizes) in the bivariate analysis and after partialling out variance associated with neuroticism. SAS was significantly associated with trait ratings of all five personality disorders (indicating that higher SAS scores were associated with higher personality disorder trait ratings) in both the bivariate and partialled analyses. The effect sizes generally remained comparable across the two analyses, with the exception of avoidant personality disorder, which dropped from a medium to small effect size.

Table 2.

Bivariate and Partial Correlations of Schizotypal Ambivalence Scale Scores with Interview Outcome Measures in Study 2 (n = 152).

<u>Interview Criteria</u>	<u>Bivariate Correlation</u>	<u>Partial Correlation</u>
Global Functioning	-0.40***	-0.32***
Schizotypal PD traits	0.43***	0.35***
Schizoid PD traits	0.18*	0.18*
Paranoid PD traits	0.41***	0.39***
Borderline PD traits	0.56***	0.37***
Avoidant PD traits	0.43***	0.17*

Medium effect sizes in bold, large effect sizes in bold and italics. Bivariate correlation of Schizotypal Ambivalence Scale score and interview criteria.

Partial correlation of Schizotypal Ambivalence Scale score and interview criteria after partialling NEO-3-FFI neuroticism score.

* $p < .05$; ** $p < .01$; *** $p < .001$.

We examined the association of SAS with personality disorder diagnoses. Given the instability of personality disorder diagnoses and our use of a non-clinically ascertained sample, we included participants who met criteria for at least 3 of the schizoid, paranoid, or avoidant criteria, or at least 4 of the schizotypal or borderline criteria in these analyses. Two participants met these broad criteria for schizotypal, five for schizoid, one for paranoid, three for borderline, and twelve participants met the criteria for avoidant personality disorder. We conducted a binary logistic regression using the standardized SAS score to predict any broad personality disorder diagnosis. SAS was significantly associated with personality disorder diagnosis, odds ratio = 3.61, 95% CI of 1.96 to 6.67, $p < .05$.

A total of 44 % of the sample reported past or current depressive episodes. SAS scores were significantly associated with depressive episodes, odds ratio = 1.78, 95% CI of 1.27 to 2.49, $p < .001$. However, this association was no longer significant after partialling out neuroticism, off ratio = 1.1, 96% CI of 0.77, $p = .47$. Only 3.3.% of the sample reported manic/hypomanic episodes. SAS scores were not significantly associated with manic/hypomanic episodes at either the bivariate level, odds ratio = 1.27, 95% CI of 0.54 to 2.97, $p = .58$, or after accounting for neuroticism, odds ratio = 1.09, 95% CI of 0.36 to 3.33, $p = .87$.

Consistent with the findings of the first study, Study 2 found that schizotypal ambivalence was associated with impaired functioning and schizophrenia-spectrum and borderline personality disorder traits (generally on the order of medium to large effects). Study 2 offered several advances over the initial study in that it analyzed schizotypal ambivalence as a continuous variable, consistent with its formulation as a dimensional trait. It added assessment of avoidant personality disorder, which has been suggested to be part of the schizophrenia spectrum (e.g., Fogelson et al., 2007) and exhibits an ambivalent component of simultaneously wanting social contact, but avoiding it due to a sense of personal inadequacy and fear of humiliation. The study also considered the extent to which schizotypal ambivalence was associated with symptoms and impairment over-and-above the effects of neuroticism. The magnitude of the associations of SAS scores remained largely unchanged, except for avoidant personality disorder and major depressive disorder. This was not surprising given that these conditions would be expected to be more strongly associated with neuroticism (e.g., Klein, Kotov, & Bufferd, 2011; Wilberg, Urnes, Friis, Pedersen, & Karterud, 1999) than with schizotypal ambivalence. Thus, the study provided further support

for the association of schizotypal ambivalence with schizophrenia-spectrum and borderline psychopathology.

4. Study 3

Study 3 expanded upon Study 2 by including interview measures of positive (psychotic-like), negative (deficit), and disorganized schizotypy experiences, in addition to assessing global functioning, personality disorder traits, and mood episodes. Note we use the term schizotypic “experiences” to capture both clinical symptoms and subclinical manifestations. As in the previous study, Study 3 treated SAS scores as a continuous variable and again examined whether the bivariate results are maintained after partialling out variance associated with neuroticism. It was hypothesized that the study would replicate the findings that SAS scores are associated with impaired functioning and elevated personality disorder traits. Furthermore, consistent with Mann et al. (2008), it was hypothesized that SAS scores would be significantly associated with positive (psychotic-like), negative, and disorganized schizotypic experiences, and these effects would remain after accounting for neuroticism.

4.1. Method

4.1.1. Participants

Participants were 162 young adults enrolled at the University of Illinois at Urbana-Champaign in 2021 and 2022. Recruitment methods were the same as in Study 2. The sample size provided sufficient power to detect small effect sizes at alpha of 0.05. Demographic characteristics of the sample were: Mage = 19.1 years, SD = 1.4; sex = 67 %F/33 %M. The study was approved by the institution’s IRB and complied with APA ethical standards. Participants provided informed consent and received course credit for taking part in the study.

4.1.2. Materials and procedures

Due to the COVID-19 pandemic, 94 interviews were conducted inperson and 67 were conducted virtually using the Zoom meeting platform. Participants completed the SAS intermixed with the infrequency scale, and the 12-item NEO-3-FFI neuroticism subscale. Consistent with Study 2, the interview battery included the IPDE schizoid, schizotypal, paranoid, borderline, and avoidant personality disorder modules and the SCID-5 overview and mood modules. Functioning was rated using the GAF.

The Structured Interview for Prodromal Symptoms (SIPS; McGlashan et al., 2001) was administered to assess clinical and subclinical manifestations of positive and disorganized schizotypy. The SIPS positive symptom subdomains include unusual thought content/delusional ideas, suspiciousness/persecutory ideas, grandiose ideas, perceptual abnormalities/hallucinations, and bizarre thinking. The SIPS disorganized symptom subdomains include disorganized communication, odd behavior or appearance, trouble with focus and attention, and impairment in personal hygiene. To assess subclinical and clinical levels of negative schizotypy, we administered the interview-based Negative Symptom Manual (NSM; Kwapil & Dickerson, 2001). The NSM assesses five subdomains of negative schizotypy: anhedonia, social withdrawal, avolition/anergia, affective flattening, and alogia. The NSM was employed as it is associated with negative

schizotypy and schizoid symptoms and is not saturated with depressive and positive symptoms (Kwapil, Barrantes-Vidal, & Silvia et al., 2008).

After providing consent, participants completed the questionnaires (15 min) and semi-structured interviews (1-to-2 h). Interviews were conducted by a trained assessor supervised by a licensed psychologist and were audio-recorded. The interviewer and supervisor were unaware of the participants' scores on the SAS or neuroticism measure.

4.2. Results

Mean standardized score on the SAS was 0.27 (SD = 1.16, range = 1.51 to 2.58, coefficient alpha = 0.87). Mean raw score on the NEO-3- FFI neuroticism scale was 39.3 (SD = 7.9, range = 19 to 58, coefficient alpha = 0.81). SAS and neuroticism correlated $r = 0.64$ (large effect size).

Table 3 presents the correlations of the SAS with the quantitative interview measures (both bivariate correlations and after partialling neuroticism). SAS was significantly associated with impaired functioning (large effect size) in the bivariate analysis and remained significant after partialling out variance association with neuroticism (small-medium effect size). SAS was significantly associated with trait ratings of all five personality disorders, except for schizoid personality disorder in the bivariate analyses. These associations remained significant for schizotypal, paranoid, and borderline traits after partialling neuroticism, but not for avoidant personality disorder traits. SAS was significantly associated with interview ratings of positive, disorganized, and negative schizotypic experiences (all medium effects) at the bivariate level, and these associations remained significant after partialling neuroticism.

We examined the association of SAS with personality disorder diagnoses using the broad criteria described in Study 2. Nine participants met these broad criteria, including two for schizotypal and schizoid, four for avoidant, and two for borderline personality disorder. We conducted a binary logistic regression using the standardized SAS score to predict any broad personality disorder diagnosis. SAS was not significantly associated at the bivariate level, odds ratio = 1.89, 95% CI of 0.96 to 3.59, $p = .054$. The effect remained nonsignificant after adding neuroticism as a covariate, odds ratio = 1.44, 95% CI of 0.64 to 3.23, $p = .38$.

A total of 42.6 % of the sample reported past or current depressive episodes. SAS scores were significantly associated with depressive episodes, odds ratio = 2.24, 95% CI of 1.61 to 3.11, $p < .001$. This association remained significant after partialling out neuroticism, odds ratio = 1.62, 95% CI of 1.09 to 2.24, $p < .05$. Thirteen percent of the sample reported manic/hypomanic episodes. SAS scores were not significantly associated with manic/hypomanic episodes at either the bivariate level, odds ratio = 1.38, 95% CI of 0.91 to 2.08, $p = .13$, or after accounting for neuroticism, odds ratio = 1.40, 95% CI of 0.82 to 2.41, $p = .22$.

4.2.1. Exploratory analyses of the associations of SAS with individual personality disorder traits

The SAS exhibited significant (and in many cases sizable) relations with the dimensional ratings of the five personality disorders. However, to better understand these associations, we examined the correlations of the SAS scores with the individual traits comprising the five personality disorders (see Supplementary Tables 1 to 5). Given the comparability of methods, measures, and findings in Studies 2 and 3 and that we were conducting exploratory analyses (that did not reflect a priori goals or hypotheses of the studies), we created a combined sample of 313

Table 3.

Bivariate and Partial Correlations of Schizotypal Ambivalence Scale Scores with Interview Outcome Measures in Study 3 (n = 162).

<u>Interview Criteria</u>	<u>Bivariate Correlation</u>	<u>Partial Correlation</u>
Global Functioning	<i>-0.54***</i>	- 0.29***
Schizotypal PD traits	0.41***	0.27***
Schizoid PD traits	0.05	0.03
Paranoid PD traits	0.34***	0.18*
Borderline PD traits	0.53***	0.30***
Avoidant PD traits	0.41***	0.13
SIPS Positive Symptoms	0.41***	0.33***
SIPS Disorganized Symptoms	0.35***	0.17*
NSM Negative Symptoms	0.33***	0.23**

Medium effect sizes in bold, large effect sizes in bold and italics. Bivariate correlation of Schizotypal Ambivalence Scale score and interview criteria.

Partial correlation of Schizotypal Ambivalence Scale score and interview criteria after partialling NEO-3-FFI neuroticism score.

* $p < .05$; ** $p < .01$; *** $p < .001$.

participants for the purposes of these analyses (in part to avoid running twice the number of exploratory analyses in smaller samples). Following our analytic strategy in Studies 2 and 3, we reported both the bivariate and partial correlations. SAS scores exhibited the strongest relations with the positive schizotypy traits of schizotypal personality disorder, including odd beliefs, unusual perceptual experiences, and suspiciousness. These associations remained after partialling neuroticism. Likewise, SAS scores were broadly associated with paranoid personality disorder traits. In contrast, SAS scores were generally unassociated with individual schizoid personality disorder traits. SAS scores were significantly associated with all the borderline personality disorder traits at the bivariate level (generally medium effects) and the majority of these associations remained significant (albeit attenuated) after partialling neuroticism. Finally, SAS scores were significantly associated with all the avoidant personality disorder traits at the bivariate level, but most of these appeared better explained by neuroticism.

4.3. Discussion

Study 3 generally replicated and extended the findings of the previous studies. Schizotypal ambivalence was associated with impaired functioning (large effect) and with schizophrenia-spectrum symptoms (medium effects) and borderline personality disorder traits (large effects). In contrast to the previous studies, SAS scores were unassociated with schizoid personality disorder traits. The associations with schizophrenia-spectrum and borderline psychopathology remained significant (albeit on the order of small to medium effect sizes) after partialling variance associated with neuroticism. Examination of the individual personality disorder traits suggests that schizotypal ambivalence has its strongest associations with borderline and positive (psychotic-like) schizotypal traits.

5. General discussion

5.1. Considering the construct of schizotypal ambivalence

The concept of ambivalence played an important role in the developmental psychopathology literature related to schizophrenia-spectrum psychopathology, as evidenced by Bleuler's (1911/1950) inclusion of ambivalence as one of four fundamental symptoms of schizophrenia that he indicated were always present in the disorder. Bleuler coined the term to describe the "tendency of the schizophrenic psyche to endow the most diverse psychisms with both a positive and negative indicator at one and the same time" (p. 53). In fact, Bleuler stated that "ambivalence is such an immediate consequence of the schizophrenic association disturbance that its complete absence appears highly improbable" (p. 53). Meehl (1962) characterized ambivalence as one of four core symptoms in his original formulation of schizotypy, although he subsequently (Meehl, 1990) relegated ambivalence to a secondary role as a potentiating factor in schizotypy. Ambivalence also has played a prominent role in the formulation of borderline personality disorder. For example, Kernberg (1977) viewed that ambivalence, as characterized by difficulty integrating positive and negative introjects, was a fundamental basis of borderline personality disorder.

Despite the prominent role of ambivalence in both schizophrenia-spectrum and borderline psychopathology, ambivalence has not played a major role in our current diagnostic nosology. The terms "ambivalence" and "ambivalent" only occur four times in DSM-5 (American Psychiatric Association, 2013) and never in regards to the diagnoses of schizophrenia-spectrum or borderline personality disorders. The diagnosis of DSM-5 borderline personality disorder captures characteristics of ambivalence (especially in terms of unstable interpersonal attachments), but ambivalence is not formally listed as part of the criteria. Furthermore, the construct has received little attention from social, personality, or emotion researchers or experimental and developmental psychopathologists, and has been largely neglected by modern clinical, developmental, and experimental formulations and examinations of psychopathology. It appears to have been largely left to the provinces of psychoanalytic theory and practice, as well as colloquial usage. Furthermore, it is unclear the extent to which the construct can simply be understood as part of normal personality domains such as neuroticism or pathological personality traits such as negative affectivity.

Nevertheless, ambivalence appears to tap dysregulation in emotion, cognition, sense of self, attachment, and interpersonal relations. Bleuler (1911/1950) believed that ambivalence resulted from a disruption of associative threads, such that "the schizophrenic, with his weakened associative linkings does not necessarily bring the different aspects of a problem together" (p. 374). Current colloquial usage of ambivalence tends to refer to indecision, mild vacillation in feelings, or mixed feelings and interests. However, Bleuler viewed ambivalence as a manifestation of thought disorder that rendered patients with schizophrenia unable to navigate the world successfully. The ambivalence described by Bleuler seems to provide a promising construct for capturing and understanding psychopathology and personality disorder traits, although the lack of clarity regarding the construct has undoubtedly limited its utility. Raulin and Brenner (1993) provide a useful road map for revitalizing the construct by providing a clear and focused operationalization of schizotypal ambivalence, as well as a psychometrically sound inventory, that paves the way forward for examination of the model and measure's construct validation.

5.2. Considering the measurement of schizotypal ambivalence

Raulin (1986) developed the SAS to focus almost exclusively on synchronic ambivalence considered characteristic of schizotypy and schizophrenia by including items that assess difficulty integrating contradictory emotions and cognitions. The result was a brief and focused measure. Despite its limited history of use, the scale has an impressive psychometric record that includes demonstrated unidimensionality and good internal consistency and test–retest reliabilities. Despite being developed prior to the ready availability of many modern scale development methods, Deters et al. (2022) employed item response theory and differential item functioning to demonstrate good item discrimination and minimal gender and racial bias.

Questionnaire studies indicate that the SAS has moderate to large associations with questionnaire measures of positive, negative, and disorganized schizotypy (Cicero & Kerns, 2010; Kwapil et al., 2002; Mann et al., 2008). Ambulatory assessment indicates that the SAS is associated with affective dysregulation and stress reactivity in daily life (Burgin et al., 2015). Furthermore, the most convincing evidence for the validity of the SAS appears to come from five interview studies, including three from the present investigation, that repeatedly demonstrate that the SAS is associated with impaired functioning and with schizophrenia-spectrum and personality pathology in non-clinically ascertained young adults (e.g., Kwapil et al., 2002; Mann et al., 2008). This consistent and converging pattern of evidence is especially striking given current concerns about a replication crisis in psychology (e.g., Diener & Biswas-Diener, 2019). Note that the five interview studies assessing the SAS have occurred across two decades, in two geographical regions, and have examined the SAS both categorically and continuously.

The five interview studies all reported that the SAS was associated with impaired functioning using the GAF scale. Three studies found large effect sizes and two found medium effects. The GAF is a broad measure that collapses across multiple domains of functioning. However, it is striking that the SAS consistently taps impaired functioning in non-clinically ascertained samples of young adults. Nevertheless, future studies should more carefully examine the specific nature of the functional impairments associated with ambivalence. All five interview studies assessed schizophrenia-spectrum personality disorder traits. In terms of schizotypal and paranoid personality disorder traits, three studies reported medium effect sizes, and one each reported small and large effect sizes. The effects were generally small for the association with schizoid personality disorder traits. Three studies (all in this report) indicated large effects for the associations of SAS with borderline personality disorder traits, and two studies reported medium associations with avoidant personality disorder traits. Three studies examined the associations of SAS with interview ratings of positive and negative schizotypic experiences. For both types of experiences, two studies indicated medium effects and one had small effects. These findings are striking both for their consistency and the sizable associations in ostensibly high functioning samples. Not surprisingly, we found relatively high rates of depressive disorders across the young adult samples, although the associations with SAS were mixed. Three of the five interview studies failed to find a significant association between SAS and depressive diagnoses, whereas two studies (from the present report) did so.

Conceptually, schizotypal ambivalence shares features with neuroticism, and this is borne out in the large correlation of neuroticism and the SAS. This raised the issue of whether the associations of the SAS with measures of psychopathology and impairment may simply reflect the effects of neuroticism, without any independent contribution of ambivalence. Thus, we examined

whether the significant associations of the SAS with our interview outcome measures were maintained after partialling out variance associated with neuroticism. Note that Lynam, Hoyle, and Newman (2006) have argued that residualized variables may differ conceptually and psychometrically from the original variable. However, our goal was not to characterize the nature of residualized SAS, but simply to consider whether the effects of SAS are better accounted for by neuroticism. Simply put, SAS broadly remained associated with our outcome measures of impairment and schizophrenia spectrum and borderline personality traits. Not surprisingly, neuroticism appeared to play a larger role in the association of the SAS with avoidant personality disorder traits and depressive disorders.

5.3. Moving forward

Ambivalence, and specifically schizotypal ambivalence, offers a useful construct for understanding psychopathology. Furthermore, the SAS offers a brief, non-invasive, and psychometrically sound questionnaire that is reliably associated with schizotypic and borderline personality psychopathology. Current models of schizotypy support a multidimensional structure with positive, negative, and disorganized dimensions. Schizotypal ambivalence appears to have moderate to strong associations with all three dimensions. Thus, future research should focus on understanding the nature of these associations and the extent to which schizotypal ambivalence can be understood as part of multidimensional schizotypy.

We further suggest two speculative, but potentially fruitful, areas that might be pursued by researchers. DSM-5 introduced an alternative model of personality disorders (AMPD; Section III), which hoped in part to help to integrate the personality and personality disorder research fields. The AMPD was developed in part to address the massive comorbidity of personality disorders. Schizotypal ambivalence (and the SAS) may facilitate the reconceptualization of personality disorders given that it shows remarkably strong associations with several such disorders, while showing limited association with other disorders (e.g., mood and substance use disorders). Schizotypal ambivalence may represent an underlying functional dimension that shapes several personality disorders, as well as schizophrenia-spectrum disorders.

One does not inherit psychiatric disorders but rather inherits underlying processes that in concert with the environment increase (or protect against) the risk for such disorders, as Meehl (1962) first pointed out. The mechanisms behind these processes are likely to be variations in neurological functioning that change our experience of the world and thus our reactions to it. The fact that most people cannot even imagine the extreme ambivalence that Bleuler first pointed out (e.g., simultaneously loving and hating someone) suggests that this may be the kind of underlying neurological variation that could have dramatic long-term effects. Studying the potential cognitive and neurological correlates of SAS might help us to uncover dysfunctions that form part of the causal chain for one or more disorders.

The present review and findings indicate that as hypothesized ambivalence measured by the SAS is robustly associated with questionnaire measures of multidimensional schizotypy and neuroticism, and with interview measures of schizophrenia-spectrum symptoms, borderline personality traits, and impaired functioning. The SAS does not appear to have clear or consistent associations with mood disorders or substance use. However, as noted in the introduction, the term ambivalence has been used to describe an array of characteristics with pathological and non-pathological expressions. Future research should consider the extent to which the SAS maps onto other definitions and measures of ambivalence, and the extent to which distinct aspects of

ambivalence characterize schizotypy, borderline personality traits, and other forms of psychopathology (as well as nonpathological expressions). The finding that the SAS was associated with all five of the personality disorders that we assessed suggests that ambivalence may be a cross-cutting component of personality pathology. Further study should examine whether it is associated with the remaining personality disorders. Likewise, examination of the association of the SAS and the domains and facets comprising the Alternative Model of Personality may better place ambivalence within a multidimensional model of personality pathology.

6. Conclusions

In summary, the SAS appears especially promising as a screening inventory that can easily be integrated with laboratory and interview studies. The present report employed the SAS using both an extreme groups design and as a continuous predictor. However, we recommend that the SAS ideally should be employed as a continuous measure, given that schizotypal ambivalence appears best conceptualized as a continuous trait, there are not meaningfully identified cut-points for the SAS, and researchers note the general dangers of arbitrarily dichotomizing continuous measures (e.g., MacCallum, Zhang, Preacher, & Rucker, 2002). The converging evidence from cross-sectional interview studies is promising. However, a longitudinal study is needed to examine the validity of the SAS for predicting the development of schizophrenia spectrum and borderline psychopathology. The present studies examined schizotypal ambivalence in young adults selected from college student samples, limiting the generalizability of the findings. Note that only limited studies have examined the utility of the SAS in clinical populations (e.g., Docherty, Cicero, Becker, & Kerns, 2014). Thus future studies should examine the expression and correlates of schizotypal ambivalence in clinically ascertained samples.

CRedit authorship contribution statement

Thomas R. Kwapil: Project administration, Conceptualization, Formal analysis, Supervision, Writing – original draft. Maryanne S. Edmundson: Data curation, Investigation. Laura M. Hernandez: Data curation, Investigation, Writing – review & editing; Kathryn C. Kemp: Data curation, Investigation, Writing – review & editing. Katrina S. Rbeiz: Data curation, Investigation. Haley E. Clark: Data curation, Investigation. Alyssa J. Bathery: Data curation, Investigation. Michael L. Raulin: Conceptualization, Writing – review & editing. Neus Barrantes-Vidal: Conceptualization, Methodology, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data are available on Open Science Framework at <https://osf.io/69tfp/>.

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Although our research team regularly pre-registers our studies, the three studies presented here were not preregistered as they represented data collection across multiple studies and multiple years. Note

that data from Studies 1 & 3 have not been previously published. The interview data from Study 2 was previously published (Kwapil et al., 2022), but did not involve any analyses involving the Schizotypal Ambivalence Scale. Note that the hypotheses for each study related to Schizotypal Ambivalence were developed prior to analysis of the data for each study.

Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jrp.2022.104312>.

References

- American Psychiatric Association. (1980). *Diagnostic and Statistical Manual of Mental Disorders (Third Edition)*. Washington, DC: American Psychiatric Association.
- American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision*. Washington, DC: American Psychiatric Association.
- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders (Fifth Edition)*. Washington, DC: American Psychiatric Association.
- American Psychiatric Association. (2022). *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision*. Washington, DC: American Psychiatric Association.
- Bleuler, E.P. (1911/1950). *Dementia Praecox or the Group of Schizophrenias*. (J. Zinkin, Trans.). New York: International Universities Press. (Original work published in 1911).
- Burgin, C. J., Chun, C. A., Horton, L., Barrantes-Vidal, N., & Kwapil, T. R. (2015). The expression of schizotypal ambivalence in daily life. *Journal of Psychopathology and Behavioral Assessment*, 2, 349–357.
- Chapman, L. J., & Chapman, J. P. (1983). Infrequency scale for personality measures. Unpublished scale available from T.R. Kwapil, UIUC Department of Psychology, Champaign, IL 61802
- Chapman, L. J., Chapman, J. P., Kwapil, T. R., Eckblad, M., & Zinser, M. C. (1994). Putatively psychosis-prone subjects 10 years later. *Journal of Abnormal Psychology*, 103, 171–183.
- Chapman, L. J., Chapman, J. P., & Raulin, M. L. (1976). Scales for physical and social anhedonia. *Journal of Abnormal Psychology*, 85, 374–382.
- Chapman, L. J., Chapman, J. P., & Raulin, M. L. (1978). Body image aberration in schizophrenia. *Journal of Abnormal Psychology*, 87, 399–407.
- Cicero, D. C., & Kerns, J. G. (2010). Can disorganized and positive schizotypy be discriminated from dissociation? *Journal of Personality*, 78, 1239–1270.
- Cohen, A., Minor, K., & Najolia, G. (2010). A framework for understanding experiential deficits in schizophrenia. *Psychiatry Research*, 178, 10–16.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 155–159.
- Conner, M., & Sparks, P. (2002). Ambivalence and attitudes. *European Review of Social Psychology*, 12, 37–70.
- Deters, L., Silvia, P.J., & Kwapil, T.R. (2022). The Schizotypal Ambivalence Scale: An Item Response Theory Analysis. Manuscript submitted for publication.

- Diener, E., & Biswas-Diener, R. (2019). The replication crisis in psychology. In R. Biswas-Diener, & E. Diener (Eds.), *Noba Textbook Series: Psychology*. Champaign, IL: DEF publishers.
- Docherty, A. R., Cicero, D. C., Becker, T. M., & Kerns, J. G. (2014). Self-reported ambivalence in schizophrenia and associations with negative mood. *Journal of Nervous and Mental Disease*, 202, 70–73.
- Eckblad, M. L., & Chapman, L. J. (1983). Magical ideation as an indicator of schizotypy. *Journal of Consulting and Clinical Psychology*, 51, 215–225.
- Eckblad, M.L., Chapman, L.J., Chapman, J.P., & Mishlove, M. (1982). The Revised Social Anhedonia Scale. Unpublished test copies available from T.R. Kwapil, UIUC Department of Psychology, Champaign, IL 61820.
- First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (1995). *Structured Clinical Interview for DSM-IV Axis I Disorders*. New York, NY: Biometrics Research Department.
- First, M. B., Williams, J. B. W., Karg, R. S., & Spitzer, R. L. (2015). *Structured Clinical Interview for DSM–5 Disorders*. Washington, DC: American Psychiatric Press Inc.
- Fogelson, D. L., Nuechterlein, K. H., Asarnow, R. A., Payne, D. L., Subotnik, K. L., Jacobson, K. C., Neale, M. C., & Kendler, K. S. (2007). Avoidant personality disorder is a separable schizophrenia-spectrum personality disorder even when controlling for the presence of paranoid and schizotypal personality disorders: The UCLA family study. *Schizophrenia Research*, 91, 192–199.
- Gross, G. M., Kwapil, T. R., Raulin, M. L., Silvia, P. J., & Barrantes-Vidal, N. (2018). The Multidimensional Schizotypy Scale-Brief: Scale development and psychometric properties. *Psychiatry Research*, 216, 7–13.
- Gunderson, J. G., & Singer, M. T. (1975). Defining borderline patients: An overview. *American Journal of Psychiatry*, 132, 1–10.
- Hoch, P. H., & Polatin, P. (1949). Pseudoneurotic forms of schizophrenia. *Psychiatric Quarterly*, 23, 248–276.
- Horan, W. P., Green, M. F., Kring, A. M., & Nuechterlein, K. H. (2006). Does anhedonia in schizophrenia reflect faulty memory for subjectively experienced emotions? *Journal of Abnormal Psychology*, 115, 496–508.
- Kernberg, O. F. (1967). Borderline personality organization. *Journal of the American Psychoanalytic Association*, 15, 641–685.
- Kernberg, O.F. (1970). A psychoanalytic classification of character pathology. *Object Relations Theory and Clinical Psychoanalysis*. New York: Jason Aronson, 139-160.
- Kernberg, O. F. (1977). The structural diagnosis of borderline personality organization. In P. Hartocollis (Ed.), *Borderline personality disorder: The concept, the syndrome, the patient* (pp. 87–121). New York: International Universities Press.
- Klein, D. N., Kotov, R., & Bufferd, S. J. (2011). Personality and depression: Explanatory models and review of the evidence. *Annual Review of Clinical Psychology*, 7, 269–295.
- Kwapil, T. R. (1996). A longitudinal study of drug and alcohol use by psychosis-prone and impulsive-nonconforming subjects. *Journal of Abnormal Psychology*, 105, 114–123.

- Kwapil, T. R., Barrantes-Vidal, N., & Silvia, P. J. (2008). The dimensional structure of the Wisconsin Schizotypy Scales: Factor identification and construct validity. *Schizophrenia Bulletin*, 34, 444–457.
- Kwapil, T.R., & Dickerson, L.A. (2001). Negative Symptom Manual. Unpublished manual available from T.R. Kwapil, University of Illinois Department of Psychology, Champaign, IL 61820.
- Kwapil, T. R., Gross, G. M., Silvia, P. J., Raulin, M. L., & Barrantes-Vidal, N. (2018). Development and psychometric properties of the Multidimensional Schizotypy Scale: A new measure for assessing positive, negative, and disorganized schizotypy. *Schizophrenia Research*, 193, 209–217.
- Kwapil, T. R., Mann, M. C., & Raulin, M. L. (2002). Psychometric properties and concurrent validity of the Schizotypal Ambivalence Scale. *Journal of Nervous and Mental Disease*, 190, 290–295.
- Kwapil, T. R., Raulin, M. L., & Midthun, J. (2000). A ten-year longitudinal study of intense ambivalence as a predictor of risk for psychopathology. *Journal of Nervous and Mental Disease*, 188, 402–408.
- Kwapil, T. R., Clark, H. E., Rbeiz, K. S., Bathery, A. J., Kemp, K. C., & Barrantes-Vidal, N. (2022). Association of positive, negative, and disorganized schizotypy with cluster a, borderline, and avoidant personality disorders and traits. *Personality Disorders: Theory, Research, & Treatment*, 13, 182–191.
- Lynam, D. R., Hoyle, R. H., & Newman, J. P. (2006). The perils of partialling: Cautionary tales from aggression and psychopathy. *Assessment*, 13(3), 328–341.
- MacAulay, R. K., Brown, L. S., Minor, K. S., & Cohen, A. S. (2014). Conceptualizing schizotypal ambivalence factor structure and its relationships. *Journal of Nervous and Mental Disease*, 202, 793–801.
- MacCallum, R. C., Zhang, S., Preacher, K. J., & Rucker, D. D. (2002). On the practice of dichotomization of quantitative variables. *Psychological Methods*, 7, 19–40.
- Mann, M. C., Vaughn, A. G., Barrantes-Vidal, N., Raulin, M. L., & Kwapil, T. R. (2008). The Schizotypal Ambivalence Scale as a marker of schizotypy. *Journal of Nervous and Mental Disease*, 196, 399–404.
- McCrae, R. R., & Costa, P. T. (2010). NEO Inventories for the NEO Personality Inventory-3 (NEO-PI-3), NEO Five-Factor Inventory-3 (NEO-FFI-3), NEO Personality Inventory Revised (NEO PI-R): Professional Manual. Lutz, FL: PAR.
- McGlashan, T. H., Miller, T. J., Woods, S. W., Rosen, J. L., Hoffman, R. E., & Davidson, L. (2001). Structured Interview for Prodromal Syndromes. New Haven, Conn: Yale School of Medicine.
- Meehl, P. E. (1962). Schizotaxia, schizotypy, schizophrenia. *American Psychologist*, 17, 827–838.
- Meehl, P. E. (1964). Manual for use with checklist of schizotypic signs. Minneapolis: University of Minnesota, Research Laboratories of the Department of Psychiatry.

- Meehl, P. E. (1990). Toward an integrated theory of schizotaxia, schizotypy, and schizophrenia. *Journal of Personality Disorders*, 4(1), 1–99.
- Parnas, J., & Henriksen, M. G. (2014). Disordered self in the schizophrenia spectrum: A clinical and research perspective. *Harvard Review of Psychiatry*, 22, 251–265.
- Parnas, J., Moller, P., Kircher, T., Thalbitzer, J., Jansson, L., Handest, P., & Zahavi, D. (2005). EASE: Examination of Anomalous Self-Experience. *Psychopathology*, 38, 236–258.
- Raine, A. (1991). The SPQ: A scale for the assessment of schizotypal personality based on DSM-III-R criteria. *Schizophrenia Bulletin*, 17, 555–564.
- Raulin, M. L. (1984). Development of a scale to measure intense ambivalence. *Journal of Consulting and Clinical Psychology*, 52, 63–72.
- Raulin, M.L. (1986). Schizotypal Ambivalence Scale. Unpublished test (copies available from M.L. Raulin, Psychology Department, Youngstown State University, Youngstown, OH 44555; MikeRaulin.org).
- Raulin, M. L., & Brenner, V. (1993). Ambivalence. In C. G. Costello (Ed.), *Symptoms of schizophrenia* (pp. 201–226). New York: Wiley.
- Siever, L. J., Bernstein, D. P., & Silverman, J. M. (1991). Schizotypal personality disorder: A review of its current status. *Journal of Personality Disorders*, 5, 178–193.
- Spitzer, R. L., Endicott, J., & Gibbon, M. (1979). Crossing the border into borderline personality and borderline schizophrenia: The development of criteria. *Archives of General Psychiatry*, 36, 17–24.
- Stocker, M. (1990). *Plural and conflicting values*. Oxford: Clarendon.
- Wilberg, T., Urnes, O., Friis, S., Pedersen, G., & Karterud, S. (1999). Borderline and avoidant personality disorders and the five-factor model of personality: A comparison between DSM-IV diagnoses and NEO-PI-R. *Journal of Personality Disorders*, 13, 226–240.
- World Health Organization. (1995). *International Personality Disorder Examination Manual DSM-IV Module*. New York: Cambridge University Press.
- Zilboorg, G. (1941). Ambulatory schizophrenias. *Psychiatry*, 4, 149–155.
- Zimmerman, M., Rothschild, L., & Chelminski, I. (2005). The prevalence of DSM-IV personality disorders in psychiatric outpatients. *American Journal of Psychiatry*, 162, 1911–1918.