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Shared and unique affective abnormalities in schizotypy dimensions

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Abstract

Attention to affect is theoretically a precursor to one's ideal affect (i.e., preference for feeling low- and high-arousal positive and negative affect) and emotion regulation (ER). In schizotypy, there have been mixed findings regarding abnormalities in attention to affect. At the same time, little is known about ideal affect in schizotypy or whether differences in ideal affect or ER difficulties in schizotypy are driven by attention to affect. Thus, this study aimed to identify shared and unique abnormalities in attention to affect, ideal affect, and ER difficulties in schizotypy, and to test whether attention to affect underlies differences in ideal affect and ER difficulties. Using groups of individuals with either extreme levels of social anhedonia (SocAnh; $n = 181$), extreme levels of perceptual aberrations/magical ideation (PerMag; $n = 105$), or individuals low on both (i.e., controls; $n = 531$), we tested group differences in attention to affect, ideal affect, and ER difficulties. Our findings suggest both shared and unique affective abnormalities; compared to controls, the SocAnh group paid the least attention to positive affect. Only PerMag had heightened attention to negative affect compared to controls. Additionally, we found unique abnormalities relating to ideal affect but mostly shared difficulties in ER in schizotypy. Abnormalities in ideal affect and ER remain largely consistent after accounting for attention to affect for PerMag, suggesting that attention to affect is not the primary mechanism driving these abnormalities. However, we found evidence that attention to affect underlies some SocAnh–control group differences in ideal affect and ER difficulties. Our work helps to clarify prior work and contributes to the understanding of shared and unique affective abnormalities in schizotypy. Future research may consider longitudinal approaches to test causal mechanisms of affective abnormalities in schizotypy.

KEYWORDS

attention to affect, emotion regulation, ideal affect, psychosis risk, schizophrenia-spectrum disorders

INTRODUCTION

"Schizotypy" describes a multidimensional spectrum of traits and symptoms that are associated with an increased risk of developing schizophrenia-spectrum disorders (Kwapil & Barrantes-Vidal, 2012; Kwapil & Barrantes-Vidal, 2015; Lenzenweger, 2006). Positive schizotypy is associated with heightened levels of aberrant perceptual experiences and magical ideation (PerMag; Chapman et al., 1980; Eckblad & Chapman, 1983; Karcher & Shean, 2012). Among other characteristics (e.g., alogia, avolition), negative schizotypy is associated with heightened social anhedonia (SocAnh), which indicates a lack of interest in emotional connections and friendships as well as a preference for solitude (Brown et al., 2007; Kwapil, 1998; Kwapil et al., 2009; Li et al., 2021). Although both PerMag and SocAnh are associated with affective abnormalities (Berenbaum et al., 2006; Martin et al., 2011), some of these abnormalities tend to be shared, whereas others tend to be unique to one dimension of schizotypy (e.g., Martin et al., 2011; Martin, Hua, et al., 2019a).

Affective abnormalities may encompass disturbances in the experience, attention to, and regulation of emotion (Berenbaum et al., 2003). These abnormalities are prevalent in the manifestation of multiple psychological disorders, including schizophrenia-spectrum disorders (Kring, 2008). Furthermore, affective abnormalities are related to social and emotional functioning in individuals along the schizophrenia spectrum (Berenbaum et al., 2006; Martin, Castro, et al., 2019b; Moore et al., 2019). However, affective abnormalities in schizotypy are generally not well understood nor well treated (Blanchard et al., 1998). Thus, a deeper understanding of affective abnormalities may help researchers and clinicians to

better identify and treat them. The current study aimed to examine shared and unique abnormalities in attention to affect, as well as ideal affect and emotion regulation (ER)—both of which are theoretically driven by how one attends to affect—in schizotypy, and how attention to affect may account for these other potential affective abnormalities.

ABNORMALITIES IN ATTENTION TO AFFECT IN SCHIZOTYPY

Some shared and unique affective abnormalities in schizotypy are related to attention to affect (Berenbaum et al., 2006; Kerns et al., 2008; Martin et al., 2011; Martin et al., 2017). Attention to affect has been conceptualized as part of "meta-mood processing," or processing that occurs after the onset of an emotion (Mayer & Gaschke, 1988). From this perspective, attention to affective information may influence people's preferences and values for feeling certain affective states ("ideal affect"; Gasper & Clore, 2000; Gohm & Clore, 2000; Larsen, 2000) and is a first step to identifying and regulating one's affective experience ("emotion regulation"; Mayer & Gaschke, 1988; Mayer & Salovey, 1997; Salovey et al., 1995).

Previous research has found that PerMag is associated with greater attention to emotion whereas SocAnh is associated with less attention to emotion (Berenbaum et al., 2006). Further research suggests that abnormalities in attention to affect may extend to valence, in that individuals with PerMag and SocAnh report differences in attention to positive versus negative affect compared to controls (Martin et al., 2011). However, these findings have been mixed. For example, Martin et al. (2011) found that SocAnh have lower attention to positive affect and PerMag have heightened attention to negative affect whereas Li et al. (2019) reported that both dimensions of schizotypy have lower attention to positive affect and heightened attention to negative affect compared to controls. Taken together, although not entirely consistent, findings suggest that schizotypy is associated with abnormalities in attention to affect.

Data from electrophysiological and behavioral assessments also suggest shared and unique abnormalities in attention to affect in schizotypy (e.g., Fung et al., 2017). For example, researchers found that both PerMag and SocAnh groups had larger neural responses to negative images than controls while only the SocAnh group had smaller neural responses to positive images than controls and the PerMag group (Martin et al., 2017; Martin et al., 2020). However, given that findings across assessments (e.g., electrophysiological and behavioral vs. self-report) are mixed regarding unique or shared abnormalities in attention to affect in SocAnh and PerMag groups, one aim of the current study was to clarify the nature of attention to affect in these groups by using a larger sample size than previous studies in this area.

IDEAL AFFECT IN SCHIZOTYPY

Attention to affective information is hypothesized to influence how preferences and values for affective states, known as ideal affect (Tsai et al., 2006), are developed and maintained over time (Gasper & Clore, 2000). Prior studies that have assessed various mood scales found that attention to or monitoring of one's feelings is associated with valuing of feelings (Booth-Butterfield & Booth-Butterfield, 1990; Gasper & Clore, 2000). Preferences for affective states may then motivate individuals to feel those states, and individual differences, including differences in attention to feelings, may cause differences in preferences for affective states (Larsen, 2000). Thus, heightened or limited attention to affective experiences could potentially bias an individual's ideal affect or preferred affective states.

A majority of literature on ideal affect has focused on cultural differences (Tsai et al., 2006; Tsai et al., 2007), though a mismatch in what an individual prefers to feel and what they actually feel is theorized to relate to psychopathology (Tsai et al., 2006). While a few studies have considered ideal affect in clinical samples (e.g., anxiety and depression; Newman & Llera, 2011; Swerdlow et al., 2019), it is unclear if there are differences in ideal affect in schizotypy, and, if so, what role attention to affect may have in diverging affective preferences.

Thus, another aim of this study was to examine ideal affect in schizotypy and to test whether attention to affect might underlie differences in ideal affect between individuals with elevated schizotypy and controls. We expected lower ideal positive affect and greater ideal negative affect in schizotypy compared to control participants. Based on prior theoretical and empirical work finding high correlations between attention to affect and valuing or preferences in affective experiences (Booth-Butterfield & Booth-Butterfield, 1990; Gohm & Clore, 2000), we also expected group differences to be smaller when accounting for attention to positive and negative affect. If group differences in ideal affect are smaller after accounting for attention to affect, this would be consistent with the hypothesis that abnormalities in attention to affect substantially underlie group differences in ideal affect. If group differences are not smaller after accounting for attention to affect, this would then suggest that something other than attention to affect may be driving group differences in ideal affect. Alternative explanations could include a set of causes influencing both attention to affect and ideal affect or reverse causation, wherein ideal affect influences attention to affect.

EMOTION REGULATION DIFFICULTIES IN SCHIZOTYPY

Similar to ideal affect, attention to affect is theoretically considered a precursor to emotion regulation (Todd et al., 2012). "Emotion regulation (ER)" refers to the modulation of emotion experiences to alter their trajectory (e.g., increasing or decreasing positive and negative emotions; Gross, 2014). Research suggests that people with typical emotional functioning are generally motivated to feel good and will regulate their emotions in ways to feel more positive (Tamir, 2016). This may be in part because of their greater likelihood to attend to their positive feelings and thus they may seek out ways to

increase their positive feelings. Indeed, individuals who are low in schizotypy attend to their positive affect more and have less difficulties regulating emotion compared to those who are high in schizotypy (Li et al., 2019; Martin et al., 2011).

Previous research using subjective and objective assessments has shown that difficulties regulating emotion and use of maladaptive ER strategies are prevalent in schizophrenia-spectrum disorders (Henry et al., 2008; Hoid et al., 2020; Li et al., 2019; O'Driscoll et al., 2014; Strauss et al., 2013). Furthermore, findings suggest shared and unique ER abnormalities in PerMag and SocAnh. Both the PerMag and SocAnh groups reported less acceptance of negative emotions, greater difficulties using regulatory strategies, greater impulsivity, and less emotional clarity (Li et al., 2019). These facets contribute to difficulties in ER (Gratz & Roemer, 2004). Only the SocAnh group had difficulties related to emotional awareness compared to controls (Li et al., 2019). While prior literature supports ER difficulties in schizotypy (Henry et al., 2008; Hoid et al., 2020; Li et al., 2019), the role that attention to affect may have in existing shared and unique ER difficulties in people with elevated schizotypy has not been previously tested. Therefore, another aim of this study was to replicate previous empirical research by examining ER difficulties in schizotypy and to extend previous work by testing whether attention to affect substantially underlies group differences in ER difficulties.

As such, we expected group differences in ER difficulties to be smaller when accounting for attention to positive and negative affect. If group differences in ER difficulties are much smaller after accounting for attention to affect, this would be consistent with the hypothesis that abnormalities in attention to affect substantially influence ER difficulties in schizotypy. If group differences are not substantially reduced after accounting for attention to affect, this would then suggest that something other than attention to affect is driving group differences in ER difficulties (e.g., a set of common causes; reverse causation).

CURRENT INVESTIGATION

The goal of this study was to examine shared and unique affective abnormalities in schizotypy, namely in attention to affect, ideal affect, and ER difficulties, and to test whether attention to affect substantially underlies differences in ideal affect and ER difficulties. First, we sought to clarify shared and unique abnormalities in attention to affect in schizotypy. Based on previous research (Martin et al., 2017; Martin et al., 2020), we predicted that the schizotypy groups would report greater attention to negative affect compared to controls and that the SocAnh group would report lower attention to positive affect compared to the other groups. Second, we sought to assess differences in ideal affect and ER difficulties in schizotypy. We anticipated that ideal affect would mirror the associations between group membership and attention to affect. Specifically, we predicted that SocAnh would have weaker preferences for positive affect compared to the other groups. We also expected that both schizotypy groups would have stronger preferences for negative affect compared to controls. Also, based on extant literature suggesting associations between SocAnh and PerMag and greater attention to negative affect, we predicted that both schizotypy groups would report greater difficulties with ER in comparison to the control group. Finally, as we theorized that attention to affect is influenced by schizotypy and influences ideal affect and ER difficulties, we expected group differences to be smaller after accounting for attention to affect.

METHOD

Participants

Undergraduate students who were taking a social science course from a large United States west coast public university were recruited to participate in an online survey study. Participants were further eligible if they reported that they were at least 18 years old, right-hand dominant, English fluent, had no current or previous history of a neurological illness or movement disorder (e.g., brain injury, Parkinson's disease), and did not take any medication that changed their mood or emotions (e.g., mood stabilizers, stimulants, antidepressants). Participants received course extra credit for participation. Study procedures were approved by the Human Research Protections of University of California Irvine and participants consented prior to completion of any study procedures.

A total of 2,218 students completed the survey. Consistent with prior research (e.g., Fung et al., 2017; Martin et al., 2011; Moore et al., 2019), we first excluded individuals based on their score on the Chapman Infrequency Scale (J. P. Chapman & Chapman, 1983), a measure of careless responsiveness ($n = 545$). Also consistent with previous research, we then used an extreme groups approach detailed below (Chapman et al., 1994; Cicero et al., 2014; Kwapil et al., 2012; Li et al., 2019; Martin et al., 2017; Preacher et al., 2005). Our final sample size was $N = 817$ ($M_{age} = 20.26$ years; $SD_{age} = 2.92$ years; 84% female; 3% African American/Black; 45% East/South/ Southeast Asian; 17% European American/White; 26% Hispanic American/Latino [a]/Mexican; 9% other/biracial).

Based on our criteria of elevated scores, we had a total of $n = 181$ in the SocAnh group, $n = 105$ in the PerMag group, and $n = 531$ in the control group. As shown in Table 1, the groups did not differ in gender, age, or ethnicity.

Measures

Chapman Infrequency Scale

The Chapman Infrequency Scale is a 13-item true–false questionnaire that includes unusual content to assess careless or invalid responsiveness (e.g., "Driving between New York and San Francisco is generally faster than flying between these cities."; Chapman & Chapman, 1983). These items were

TABLE 1 Demographic information by SocAnh, PerMag, and control groups

	SocAnh $n = 181$	PerMag $n = 105$	Control $n = 531$	Test statistic and effect size
Female *n* (%)	152 (84%)	89 (85%)	449 (85%)	$\chi^2(2, N = 817) = 0.03$, $p = .99$, $V = .004$
Age *Mean* (*SD*)	20.66 (3.05)	19.89 (1.88)	20.20 (3.04)	$F(2, 814) = 2.67$, $p = .07$, $\eta^2 = .007$
Race *n* (%)				
• African American/Black	9 (5%)	3 (3%)	11 (2%)	$p = .25$ (two-tailed Fisher's exact test), $V = .04$
• East/South/Southeast Asian	86 (48%)	52 (50%)	236 (44%)	
• European American/White	21 (12%)	15 (14%)	103 (19%)	
• Hispanic American/Latino(a)/Mexican	48 (27%)	26 (25%)	135 (25%)	
• Other/Biracial	17 (9%)	9 (9%)	46 (9%)	

intermixed with items from the Wisconsin Schizotypy Scales. Data from individuals who scored three or more on this scale were excluded from analyses.

Brief Wisconsin Schizotypy Scales

The brief version of the Wisconsin Schizotypy Scales includes shortened versions of the Revised Social Anhedonia Scale (RSAS; Eckblad et al., 1982), Perceptual Aberration Scale (PAS; Chapman et al., 1978), and the Magic Ideation Scale (MIS; Eckblad & Chapman, 1983; Winterstein et al., 2011). All three scales consist of 15 true–false items to assess schizotypy. The brief version of the RSAS (Cronbach's α in the current study = .72) assesses the extent to which individuals derive pleasure from interpersonal relationships and preferences for being with others (e.g., "Having close friends is not as important as many people say."). The brief PAS (Cronbach's α = .82) and MIS (Cronbach's α = .74) assess the extent to which individuals experience abnormal perceptual or psychotic-like experiences (e.g., "Parts of my body occasionally seem dead or unreal.") and hold unusual beliefs (e.g., "Good luck charms don't work."). The brief versions have improved psychometric properties over the originals when assessing psychosis proneness among non-White samples and have been found to have measurement invariance in that they measure the same construct across tested ethnic groups (Cicero et al., 2019; Gross et al., 2012; Li et al., 2021; Winterstein et al., 2011). We chose to focus on three of the four scales in the Brief Wisconsin Schizotypy Scales based on literature suggesting that social anhedonia, perceptual aberration, and magical ideation are consistent predictors for the future onset for schizophrenia-spectrum disorders or psychosis proneness (Chapman et al., 1980, 1994; Gooding et al., 2005; Kwapil, 1998). This methodological choice is consistent with a large body of existing work that focuses on three of the four scales (Kerns, 2006; Li et al., 2019; Martin et al., 2011).

In the current study, and consistent with previous research (Kwapil et al., 2012; Li et al., 2019; Li et al., 2020; Martin et al., 2020), individuals met the criteria for the SocAnh group if they had an elevated score on the brief RSAS (>1.5 *SD* above the mean) but not on the brief PAS or MIS (<1.5 *SD* above the mean). Individuals met the criteria for the PerMag group if they had elevated scores on the brief PAS or MIS (>1.5 *SD* above the mean on either scale) but not on the brief RSAS (<1.5 *SD* above the mean). Individuals met the criteria for the control group if they scored low for both SocAnh (<0.5 *SD* above the mean on the brief RSAS) and PerMag (<0.5 *SD* above the mean on the brief PAS and MIS).

Following Affective States Test

The Following Affective States Test (FAST) is a 16-item measure that consists of four subscales—Following Positive Feelings (Cronbach's α = .70), Following Negative Feelings (Cronbach's α = .73), Ignoring Positive Feelings (Cronbach's α = .72), Ignoring Negative Feelings (Cronbach's α = .69)—that assess the extent to which individuals attend to their positive and negative feelings (e.g., "Positive feelings give a direction to life"; "It is important to think about your negative emotions."; Gasper & Bramesfeld, 2006). Items are rated on a 7-point scale (0 = *Strongly disagree*, 3 = *Neither agree nor disagree*, 6 = *Strongly agree*). We followed Martin et al.'s (2011) approach and calculated composite scores for attention to positive affect and attention to negative affect by subtracting the standardized scores of the Ignore Feelings subscales from the standardized scores of the Following Feelings subscales for positive and negative affect, respectively.

Affect Valuation Index

The Affect Valuation Index (AVI) assesses the extent to which individuals ideally want to feel a range of affective states (i.e., ideal affect) as well as the affective states they actually feel (Tsai et al., 2006). Because we were interested in preferences and valuation of affect, we only included the Ideal Affect subscale in the current study. Participants rate their ideal affect on 15 high and low positive (e.g., elated, calm) and 15 high and low negative (e.g., nervous, dull) affective states across four subscales (High Arousal Positive, Cronbach's α = .85; Low Arousal Positive, Cronbach's α = .89; High Arousal Negative, Cronbach's α = .73; Low Arousal Negative, Cronbach's α = .86). Each of the affective states are rated on a 5-point scale (1 = *Never* - 5 = *All the time*).

Difficulties in Emotion Regulation Scale

The Difficulties in Emotion Regulation Scale (DERS) is a 36-item measure with six subscales assessing varying facets of regulatory difficulties: Nonacceptance of Emotional Responses (DERS Nonaccept, Cronbach's $\alpha = .92$; e.g., "When I'm upset, I become irritated at myself for feeling that way"), Difficulty Engaging in Goal-Directed Behavior (DERS Goals, Cronbach's $\alpha = .87$; e.g., "When I'm upset, I have difficulty concentrating"), Impulse Control Difficulties (DERS Impulse, Cronbach's $\alpha = .87$; e.g., "I experience my emotions as overwhelming and out of control"), Lack of Emotional Awareness (DERS Aware, Cronbach's $\alpha = .83$; e.g., "When I am upset, I believe that my feelings are valid and important"), Limited Access to ER Strategies (DERS Strategies, Cronbach's $\alpha = .89$; e.g., "When I'm upset, it takes me a long time to feel better"), and Lack of Emotional Clarity (DERS Clarity, Cronbach's $\alpha = .87$; e.g., "I have no idea how I am feeling"; Gratz & Roemer, 2004). The DERS has been used extensively in the literature as a common and reliable assessment tool for examining regulatory difficulties in psychopathology (e.g., Gratz et al., 2006; Hallion et al., 2018; Kashdan et al., 2008; Tull et al., 2007). Items are rated on a 5-point scale (1 = *Almost never*, 5 = *Almost always*), where subscales, as well as a total score, can be calculated.

Procedure

The current study took approximately 1 h to complete online and included measures of demographic information, schizotypy, and emotion constructs. Additional individual differences measures were included in the online survey, but because they were not relevant to our current hypotheses, are not described here.

Data analysis

Analyses were conducted on R Studio (RStudio Team, 2020). Analysis of variance (ANOVA) was used to examine group differences in attention to positive and negative affect, ideal affect, and difficulties in ER. Planned pairwise comparisons were performed as follow-up tests to specify which groups differed from each other. The Tukey HSD multiple comparison procedure was used to correct for Type 1 error. Prior to our main analyses, we checked outcome variables for normality, and adjusted skewness of variables as appropriate. Skewness values after log transformation fell between −.29 and .49. Levene's tests were conducted to assess for homogeneity of variance within groups and the outcome variables of interest. Those that did not pass Levene's test were subjected to Welch's test as an alternative to ANOVA tests, and the Games–Howell multiple comparison procedure as an alternative to the Tukey HSD.

If there were group differences in ideal affect and difficulties in ER, we planned to then conduct an analysis of covariance (ANCOVA) to examine whether these group differences in ideal affect and difficulties in ER remained after accounting for attention to positive and negative affect. Pairwise comparisons using the Tukey multiple comparison procedure were used as follow-up tests to specify which groups differed from each other. To assess whether group differences would be smaller after accounting for attention to affect, we estimated separate regression models to examine group differences in ideal affect and ER difficulties with and without attention to affect included in the models. We then compared group differences before and after statistically controlling for measures of attention to affect to quantify what proportion of the unadjusted estimates (i.e., before accounting for attention to affect) the adjusted estimates were equal to (i.e., after accounting for attention to affect).

RESULTS

Shared and unique attention to affect abnormalities in schizotypy

As can be seen in Table 2, significant group differences were observed in attention to positive affect as well as attention to negative affect. More specifically, both the SocAnh [$T(1, 814) = -10.29$, $p < .001$, $g = 0.98$] and PerMag [$T(1, 814) = -4.92$, $p < .001$, $g = 0.52$] groups reported less attention to positive affect than the control group. The SocAnh group also reported less attention to positive affect relative to the PerMag group [$T(1, 814) = -3.89$, $p = .0004$, $g = 0.45$]. Only the PerMag group reported greater attention to negative affect relative to the control group [$T(1, 814) = 3.00$, $p = .008$, $g = 0.32$]. There were no other group differences for attention to negative affect (both $ps > .15$, $gs < 0.17$). Together, our findings suggest that the schizotypy groups showed decreased attention to positive affect compared to both the control group and compared to each other (SocAnh < PerMag < Controls). Also, only the PerMag group had greater attention to negative affect compared to the control group. Following conventions for interpreting effect sizes (Cohen, 1988), overall, these effects were small to large in magnitude (Hedges' $g = 0.32$–0.98).

Shared and unique ideal affect abnormalities in schizotypy

As seen in Table 2, we found significant group differences in ideal affect. Follow-up tests revealed that the SocAnh group had weaker preferences for high-arousal positive affect compared to both the control [$T(1, 814) = -5.93$, $p < .001$, $g = 0.54$] and PerMag [$T(1, 814) = -2.87$, $p = .01$, $g = 0.34$] groups (SocAnh < PerMag = Controls). Conversely, the PerMag group had stronger preferences for high-arousal negative affect compared to the control group [$T(1, 814) = 3.74$, $p = .0008$, $g = 0.50$]. At the same time, both schizotypy groups were more likely to prefer low-arousal negative affect compared to the control group [SocAnh vs. Controls, $T(1, 814) = 3.67$, $p = .0009$,

TABLE 2 Group differences across affect measures

	SocAnh $n = 181$ M (SD)	PerMag $n = 105$ M (SD)	Control $n = 531$ M (SD)	F statistic and effect size	Post-hoc comparisons	Hedges' g	
						S vs. CS vs. P	P vs. C
Following Affective States Test (FAST)							
Attention to PA	−1.10 (1.86)	−.31 (1.50)	.48 (1.53)	$F(2, 239.01) = 57.64$, $p < .001$, $\eta^2 = .14$	S < P < C	0.98***, 0.45***	0.52***
Attention to NA	.08 (1.40)	.30 (1.38)	−.15 (1.41)	$F(2, 814) = 5.31$, $p = .005$, $\eta^2 = .01$	C < P	0.16, 0.16	0.32**
Affect Valuation Index (AVI)							
High-arousal positive affect	3.22 (.97)	3.54 (.89)	3.69 (.80)	$F(2, 231.67) = 17.70$, $p < .001$, $\eta^2 = .05$	S < P, C	0.54***, 0.34*	0.18
Low-arousal positive affect	3.71 (1.07)	3.65 (1.00)	3.85 (.89)	$F(2, 814) = 2.08$, $p = .13$, $\eta^2 = .005$	NA	0.15, 0.06	0.22
High-arousal negative affect	1.85 (.84)	2.04 (.86)	1.69 (.66)	$F(2, 229.17) = 7.76$, $p < .001$, $\eta^2 = .02$	C < P	0.23, 0.22	0.50***
Low-arousal negative affect	2.24 (1.15)	2.22 (1.14)	1.86 (.85)	$F(2, 228.56) = 9.18$, $p < .001$, $\eta^2 = .02$	C < S, P	0.41***, 0.02	0.40*
Difficulties in Emotion Regulation Scale (DERS)							
Nonacceptance	2.79 (1.06)	3.08 (1.09)	2.17 (.94)	$F(2, 795) = 48.17$, $p < .001$, $\eta^2 = .11$	C < S, P	0.64***, 0.27	0.94***
Goals	3.35 (1.01)	3.47 (.92)	2.99 (.92)	$F(2, 804) = 17.26$, $p < .001$, $\eta^2 = .04$	C < S, P	0.38***, 0.12	0.52***
Impulse	2.55 (.93)	2.75 (.96)	1.99 (.77)	$F(2, 799) = 52.50$, $p < .001$, $\eta^2 = .12$	C < S, P	0.69***, .21	0.95***
Awareness	2.79 (.84)	2.61 (.75)	2.34 (.72)	$F(2, 230.48) = 22.59$, $p < .001$, $\eta^2 = .06$	C < S, P	0.60***, 0.22	0.37**
Strategies	2.84 (.92)	2.98 (.87)	2.13 (.79)	$F(2, 249.57) = 79.70$, $p < .001$, $\eta^2 = .16$	C < S, P	0.86***, 0.16	1.06***
Clarity	2.67 (.88)	2.89 (.74)	2.13 (.72)	$F(2, 248.37) = 64.71$, $p < .001$, $\eta^2 = .13$	C < S < P	0.71***, 0.26*	1.05***

Note. $N = 19$ participants did not complete items in the Difficulties in Emotion Regulation Scale, resulting in missing data across subscales. M = Mean; C = Controls; P = PerMag; SD = standard deviation; S = SocAnh.
*$p < .05$; **$p < .01$; ***$p < .001$.

$g = 0.41$; PerMag vs. Controls, $T(1, 814) = 2.77$, $p = .02$, $g = 0.40$]. No group differences were found for low-arousal ideal positive affect.

Taken together, the findings suggest shared and unique ideal affect abnormalities in schizotypy. Compared to controls, the SocAnh group had *weaker* affective preferences for high-arousal positive affect whereas the PerMag group had *stronger* affective preferences for high-arousal negative affect. Also compared to controls, both schizotypy groups had *stronger* preferences for low-arousal negative affect. Across these findings, the effect sizes were small to medium in magnitude (Hedges' $g = 0.34$–0.54).

Shared ER difficulties in schizotypy

Significant group differences were observed for all subscales in ER difficulties. As seen in Table 2, follow-up tests revealed that across all DERS subscales, both SocAnh and PerMag groups experienced more difficulties in ER compared to controls ($ps < .001$, $gs = 0.38$–1.06). Additionally, the PerMag group reported greater lack of emotional clarity than the SocAnh group [$T(1, 799) = 2.53$, $p = .03$, $g = 0.26$] (Controls < SocAnh < PerMag). No other differences were found between the PerMag and SocAnh groups. Taken together, these findings suggest shared emotional regulation difficulties in schizotypy, with group differences being small to large in magnitude (Hedges' $g = 0.37$–1.06).

Unique abnormalities in ideal affect remain after controlling for attention to affect

To test whether differences in ideal affect in schizotypy were substantially influenced by attention to affect, we conducted an ANCOVA and included attention to positive affect and

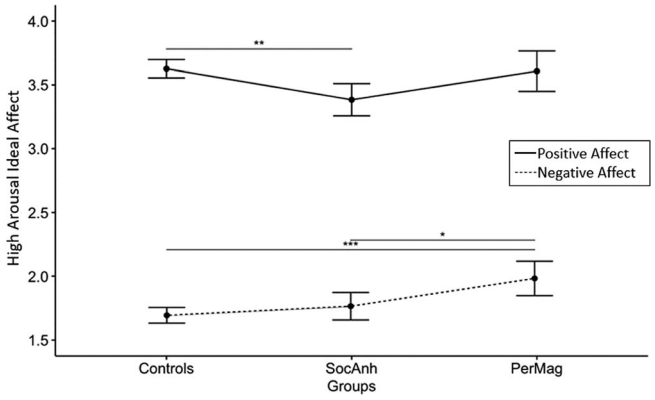

FIGURE 1 Group differences in high-arousal positive and negative ideal affect after accounting for attention to affect. *p < .05; **p < .01; ***p < .001

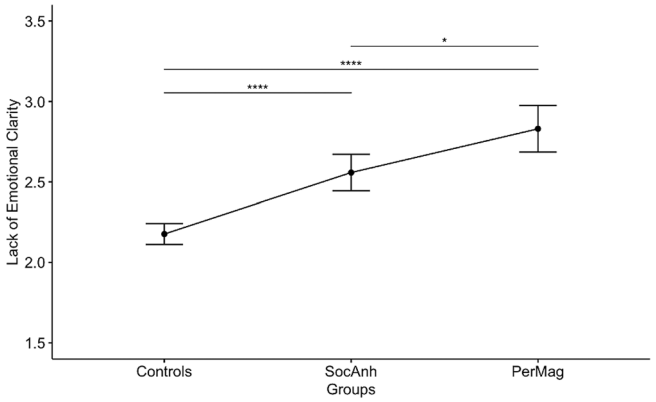

FIGURE 2 Group differences in lack of emotional clarity after accounting for attention to affect. *p < .05; **p < .01; ***p < .001; ****p < .0001

attention to negative affect as covariates. After controlling for attention to affect, unique abnormalities in high-arousal ideal affect remained significant (see Appendix A Table A for full ANCOVA results, including estimated means after including covariates). As can be seen in Figure 1, consistent with initial group findings, the SocAnh group reported weaker preferences for high-arousal positive affect compared to controls only (SocAnh < Controls; $T[1, 812] = -3.18$, $p = .005$), and the PerMag group reported stronger preferences for high-arousal negative affect compared to the other groups (PerMag vs. Controls, $T[1, 812] = 3.80$, $p < .001$); PerMag vs. SocAnh, $T(1, 812) = 2.51$, $p = .04$; SocAnh, Controls < PerMag). In contrast, the shared abnormality in low-arousal negative affect in schizotypy was no longer significant after accounting for attention to affect and adjusting for multiple comparisons ($ps > .05$). Similar to the results using ANOVAs ($\eta^2 = .02–.05$), the effect sizes for the ANCOVAs were small ($\eta^2 = .01–.02$).

Next, we estimated the extent to which group differences in ideal affect were reduced after statistically controlling for attention to affect. In general, group differences (i.e., schizotypy groups vs. control group) in ideal affect were substantially reduced after statistically controlling for attention to affect (median reduction = 46.5%; see Appendix B Table B for the calculated proportions of change for each subscale). When specifically examining significant group differences, the proportion of change in estimates of group differences between the SocAnh group and controls in preferences for high-arousal positive affect was reduced by 49% after adjusting for attention to affect. Alternatively, the reduction in group differences between the PerMag group and controls in preference for high-arousal negative affect was 14% after adjusting for attention to affect. One possible explanation is that differences in preferences for high-arousal positive affect between the SocAnh group and controls are influenced more by attention to emotion than differences in preferences for high-arousal negative affect between the PerMag group and controls. However, these findings should be interpreted cautiously, given that we included eight comparisons, and that we did not predict substantial heterogeneity in the reduction of group differences after statistically controlling for attention to affect.

Shared ER difficulties in schizotypy largely remain after controlling for attention to affect

Last, we conducted an ANCOVA with attention to affect as covariates to test whether differences in ER difficulties across groups were influenced by attention to affect. Group differences were largely the same for ER after controlling for attention to affect (see Appendix A Table A for full ANCOVA results). That is, both SocAnh and PerMag groups had greater difficulties in regulating emotion overall compared to controls (all $ps < .05$). See Figure 2 for one illustrative example. There was one unique abnormality that arose after accounting for attention to affect—the SocAnh group, but not the PerMag group, reported greater lack of emotional awareness than the control group ($T[1, 797] = 3.54$, $p = .001$). Taken together, our findings thus suggest that both SocAnh and PerMag groups have overall greater ER difficulties compared to controls even after accounting for attention to affect. Similar to the effect sizes using ANOVAs ($\eta^2 = .04–.16$), the effect sizes for the ANCOVAs were small ($\eta^2 = .02–.12$).

Finally, we estimated the extent to which group differences in ER were accounted for by attention to affect. We found evidence that, overall, attention to affect had a smaller effect on estimates of group differences in ER difficulties than on estimates of group differences in ideal affect. That is, the proportion of change in estimates of group differences in ER difficulties were mostly small across the six subscales when accounting for attention to affect (median reduction = 12%; see Appendix B Table B for the calculated proportions for each subscale). However, there were two notable exceptions. When comparing controls and the SocAnh group, attention to affect accounted for a notable decrease in group differences in lack of emotional awareness (47%) and lack of emotional clarity (33%). Thus, similar to the role of attention to affect in high-arousal positive affect, this result is consistent with the hypothesis that attention to affect might

underlie some of the group differences between the SocAnh group and controls in ER difficulties.

DISCUSSION

Affective abnormalities are core to schizophrenia-spectrum disorders yet are not well understood nor well treated (Blanchard et al., 1998). Furthermore, an estimated 10% of the general population have elevated schizotypal traits and are at risk for developing schizophrenia-spectrum disorders (Kwapil & Barrantes-Vidal, 2015; Lenzenweger, 2006; Meehl, 1962). By furthering our knowledge about affective abnormalities, specifically in attention to affect, ideal affect, and ER in individuals at risk for schizophrenia, this knowledge could potentially inform improved identification and treatment methods for affective symptoms in schizophrenia-spectrum disorders. The purpose of our study was to examine shared and unique abnormalities in attention to affect, ideal affect, and ER in schizotypy, and to examine how attention to affect may underlie differences in other facets of affective abnormalities, namely ideal affect and difficulties in ER, in schizotypy. Overall, across attention to affect, ideal affect, and difficulties in ER, we found both shared and unique affective abnormalities in schizotypy. Furthermore, we found evidence that attention to affect underlies some SocAnh–control group differences in ideal affect and ER difficulties (preference for high-arousal positive affect, two facets of ER difficulties). There was limited evidence for this hypothesis elsewhere.

The first aim of our study was to clarify mixed findings regarding abnormalities in attention to affect in schizotypy. We investigated abnormalities in attention to affect in schizotypy with a larger sample than prior studies (Fung et al., 2017; Li et al., 2019; Martin et al., 2011, 2017). In support of our hypothesis and consistent with earlier findings (Li et al., 2019), both the SocAnh and PerMag groups reported lower attention to positive affect compared to controls. In addition, the SocAnh group also reported lower attention to positive affect compared to the PerMag group, suggesting that whereas both schizotypy groups have shared abnormalities in lower attention to positive affect, individuals with elevated SocAnh may have lower attention to positive affect than the PerMag group. However, contrary to our hypothesis, but consistent with the findings of Martin et al. (2011), only the PerMag group reported greater attention to negative affect compared to controls. A potential explanation for this finding in the PerMag group is that perceptual aberration and magical ideation are associated with increased salience towards affective stimuli and negative events (Karcher & Shean, 2012; Kwapil et al., 2012). In addition, perceptual aberration and magical ideation are associated with elevated paranoid symptoms, such as heightened suspiciousness and feelings of mistreatment (Barrantes-Vidal et al., 2013). These associations with salience towards negative stimuli and paranoid symptoms may be relevant to heightened attention towards negative affect in the PerMag group.

Similar to previous work (Li et al., 2019), our findings indicated small to large effect sizes in group differences in attention to affect (Hedges' $g = 0.32–0.98$). Together, our work supports differential attention to positive and negative affect in schizotypy, with shared (lower attention to positive affect in both PerMag and SocAnh compared to controls) and unique (heightened attention to negative affect in PerMag, lower attention to positive affect in SocAnh than PerMag) abnormalities in attention to affect. It is possible that decreased attention to positive affect is a precursor to social anhedonia or a consequence of it. Chronic inattention to affect could result in people being less likely to identify the presence of positive affect and less likely to focus on positive affect when they do identify it. This could result in decreased self-reported trait levels of positive affect and lead to decreased motivation to engage socially. Over time, this could result in increased self-reported social anhedonia (Martin et al., 2013). Alternatively, social anhedonia itself could cause individuals to be less likely to identify the presence of positive affect and less likely to focus on positive affect when they do identify it. However, to our knowledge, it has not yet been examined whether decreased attention to positive affect is a precursor or consequence of social anhedonia. Other scenarios are also possible, such as another characteristic causing both social anhedonia and decreased attention to positive affect. Additional research is needed to elucidate the temporal courses of these processes.

The second aim of our study was to examine group differences in ideal affect in schizotypy and to test whether attention to affect substantially underlies these differences. We found unique abnormalities in preferences for high-arousal positive and negative affect and a shared preference for low-arousal negative affect in schizotypy groups compared to controls. We found partial support for our hypotheses, such that the SocAnh group reported weaker preferences for high-arousal positive affect compared to both the PerMag group and controls but only the PerMag group reported stronger preferences for high-arousal negative affect compared to controls. Our findings indicate small to medium effect sizes in group differences in ideal affect (Hedges' $g = 0.23–0.54$).

We then explored group differences in ideal affect after adjusting for attention to affect. Attention to affect did substantially underlie group differences in ideal affect (median reduction = 46.5%). In addition, attention to affect accounted for larger decreases in group differences in preferences for high-arousal positive affect comparing the SocAnh group to controls (49%), but less so for group differences in preferences for high-arousal negative affect comparing the PerMag group to controls (14%). The role of attention to affect in weaker preferences for high-arousal positive affect in the SocAnh group compared to controls is consistent with prior work indicating that SocAnh specifically (and not PerMag) has decreased attention to positive affect compared to controls (Li et al., 2019; Martin et al., 2011). However, future research must implement longitudinal approaches to causally test the role of attention to affect or other mechanisms that may underlie these differences in ideal affect in SocAnh.

This is the first study to assess ideal affect in individuals with elevated positive or negative schizotypy, and it fits into the broader literature about ideal affect. Some researchers have

suggested that individuals with generalized anxiety disorder or high levels of worrying may have positive beliefs about worrying. For example, individuals with greater anxiety may worry more as a proactive coping mechanism to avoid distress from future events (Borkovec & Roemer, 1995; Newman & Llera, 2011). Newman and Llera (2011) theorized that individuals with anxiety may prefer to feel anxiety-related negative affect, and this may relate to continued worry, prolonged negative affect, and heightened anxiety (Newman & Llera, 2011). This is consistent with work by Swerdlow et al. (2019), who found that greater preference for high-arousal positive and negative affect was associated with more anxiety symptoms; greater preference for high-arousal positive affect was associated with less depressive symptoms. Our finding that PerMag has stronger preferences for high-arousal negative affect may be consistent with this theory in that some individuals want to feel negative affect as it is more familiar and comforting to them. On the other hand, we found that SocAnh has weaker preferences for high-arousal positive affect, and this may reflect that they find positive affect less familiar and comforting. These speculations require further empirical research to assess their validity.

Differences in ideal affect in schizotypy may also be relevant in how these individuals anticipate and feel towards social interactions. Literature suggests that individuals with elevated SocAnh report deficits in anticipatory pleasure (Gard et al., 2007; Martin et al., 2011) and decreased enjoyment of social interactions (Martin, Castro, et al., 2019b; Moore et al., 2019; Zhang et al., 2020). Prior work has also shown associations between individuals at risk for schizophrenia-spectrum disorders and impaired interpersonal relationships and social functioning (Campellone & Kring, 2018; Llerena et al., 2012; Riehle & Lincoln, 2017). Our findings are consistent with previous literature suggesting that elevated SocAnh is associated with both less positive affect and less attention to positive affect (Kerns et al., 2008; Kwapil et al., 2012; Martin et al., 2011). We speculate that these deficits in positive affect may be related to reduced enjoyment of social interactions. However, it is still unknown how abnormalities in attention to affect and ideal affect may relate to impairments in social functioning, including enjoyment. Additional research in this area may help researchers consider treatment or interventions directed towards ideal affect and supporting social functioning.

Our third aim was to replicate previous studies finding ER difficulties in schizotypy and assess whether attention to affect underlies group differences in ER difficulties. In line with our hypotheses, we found that overall both the SocAnh and PerMag groups reported greater difficulties in ER than controls. In addition to similar findings, such as Li et al. (2019), our work indicates that individuals with elevated positive and negative schizotypy also have ER difficulties with goal-directed behavior. The PerMag group had lower emotional clarity than both the SocAnh group and controls, which is consistent with prior findings that positive schizotypy is associated with less emotional clarity (Kerns, 2005). Across the facets of ER difficulties, both the SocAnh and PerMag groups had shared deficits in ER compared to controls; however, lack of emotional awareness was a unique abnormality in SocAnh after accounting for attention to affect. Consistent with Li et al. (2019), our findings indicated small to large effect sizes in group differences in ER difficulties (Hedges' $g = 0.26–1.06$).

We then explored group differences in ER difficulties after adjusting for attention to affect. Attention to affect overall accounted for small decreases in group differences in ER difficulties when both groups were compared to controls (median reduction = 12%), but accounted for larger decreases in differences in lack of emotional awareness and clarity when comparing the SocAnh group with controls (33%–47%). As noted with findings in ideal affect, attention to affect overall had a greater influence on group differences for affective abnormalities in the SocAnh group than in the PerMag group when compared to controls. Given that the results largely remained consistent after accounting for attention to affect in ER difficulties, this suggests that attention to affect may not be a strong causal factor in ER difficulties in schizotypy. Because of the cross-sectional nature of our data, there may be alternative confounding factors or other mechanisms involved for why we might observe these differences (see, e.g., Rohrer et al., 2021). The extent to which estimates are reduced after controlling for attention to affect should not be taken as an unbiased estimate of the indirect effect of schizotypy on ideal affect through attention to affect. Likely, these estimates should be seen as upper bounds, so the generally very small indirect effects may be more causally informative than the few cases in which they are large. Still, future studies may use designs and analyses to place plausible bounds on the mediating effects of attention to affect and examine other mechanisms that may substantially influence differences in ER difficulties in schizotypy.

ER literature often focuses on general desires to feel good (Tamir, 2016), suggesting that overall, people with typical emotional functioning are more likely to decrease negative and increase positive emotions. Attending to, as well as preferences for, feeling positive or negative affect may relate to challenges in regulating emotion. Individuals with elevated SocAnh tend to have less attention towards and preferences for positive affect, which may relate to their lowered emotional awareness and motivation to engage in ER. Additionally, heightened attention towards and preference for negative affect may relate to lower clarity in one's feelings and ER difficulties in PerMag. However, additional research is necessary to clarify associations among affective abnormalities in schizotypy. Because we used cross-sectional data, we cannot consider pathway associations. A future study could use longitudinal or experience sampling approaches and consider alternative pathways to examine whether abnormalities in attention to affect or other affective constructs mediate ideal affect and ER difficulties in schizotypy. Experience sampling or daily life studies may also help increase ecological validity of existing literature. Future research may also consider electrophysiology and behavioral methods to assess ER success (e.g., smaller late positive potential after regulation compared to just viewing an image; Hajcak et al., 2010) and complement our work (i.e., self-report).

Of note, the current study used an extreme schizotypy group approach, a common method in the literature. However, recent findings suggest that using a dimensional approach to

examining abnormalities in schizophrenia-spectrum disorders and personality-spectrum disorders could improve prognostication (Kotov et al., 2020; Martin et al., 2021). Thus, future studies could examine these affective abnormalities using a dimensional approach to test if findings remain robust.

CONCLUSION

Taken together, research suggests unique and shared affective abnormalities in SocAnh and PerMag, two groups with extreme levels of schizotypy. While considering the role of attention to affect in ideal affect and ER, the current study expands upon previous work to examine group differences in ideal affect and ER difficulties in schizotypy, and to test whether attention to affect underlies differences in these affective abnormalities in extreme schizotypy. Our findings suggest that unique and shared affective abnormalities extend to affective preferences and ER difficulties in positive and negative schizotypy and that attention to affect may underlie some of the SocAnh–control group differences.

CONFLICT OF INTEREST

We do not disclose any conflicts of interest.

ETHICAL APPROVAL

The study has been approved by the authors' institiutional review board, and follows ethical standards for human subjects research.

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APPENDIX A.

TABLE A Group differences while accounting for attention to affect across affect measures

	Estimated means (*SE*)				
	SocAnh $n = 181$	**PerMag** $n = 105$	**Control** $n = 531$	***F* statistic and effect size**	**Post-hoc comparisons**
AVI					
High-arousal positive affect	3.38 (.06)	3.61 (.08)	3.63 (.04)	Attention to Positive Affect: $F(1, 812) = 61.01$, $p < .001$, $\eta^2 = .07$ Attention to Negative Affect: $F(1, 812) = 4.28$, $p = .04$, $\eta^2 = .005$ Group: $F(2, 812) = 5.23$, $p = .006$, $\eta^2 = .01$	S < C $T(1, 812) = -3.18$, $p = .005$
Low-arousal positive affect	3.81 (.07)	3.69 (.09)	3.81 (.04)	Attention to Positive Affect: $F(1, 812) = 16.85$, $p < .001$, $\eta^2 = .02$ Attention to Negative Affect: $F(1, 812) = 2.51$, $p = .11$, $\eta^2 = .003$ Group: $F(2, 812) = .84$, $p = .43$, $\eta^2 = .002$	NA
High-arousal negative affect	1.79 (.06)	2.02 (.07)	1.72 (.03)	Attention to Positive Affect: $F(1, 812) = 13.70$, $p < .001$, $\eta^2 = .02$ Attention to Negative Affect: $F(1, 812) = .07$, $p = .79$, $\eta^2 < .001$ Group: $F(2, 812) = 5.91$, $p = .003$, $\eta^2 = .01$	C < P S < P $T(1, 812) = 3.80$, $p < .001$ $T(1, 812) = 2.51$, $p = .04$
Low-arousal negative affect	2.15 (.07)	2.19 (.09)	1.90 (.04)	Attention to Positive Affect: $F(1, 812) = 16.19$, $p < .001$, $\eta^2 = .02$ Attention to Negative Affect: $F(1, 812) = .02$, $p = .90$, $\eta^2 < .001$ Group: $F(2, 812) = 4.01$, $p = .02$, $\eta^2 = .01$	NA

(Continues)

TABLE A (Continued)

	Estimated means (*SE*)				
	SocAnh $n = 181$	**PerMag** $n = 105$	**Control** $n = 531$	***F* statistic and effect size**	**Post-hoc comparisons**
DERS					
Nonacceptance	2.74 (.08)	3.02 (.10)	2.20 (.04)	Attention to Positive Affect: $F(1, 793) = 3.61$, $p = .06$, $\eta^2 = .005$ Attention to Negative Affect: $F(1, 793) = 26.95$, $p < .001$, $\eta^2 = .03$ Group: $F(2, 793) = 34.14$, $p < .001$, $\eta^2 = .08$	C < S C < P $T(1, 793) = 5.72$, $p < .001$ $T(1, 793) = 7.20$, $p < .001$
Goals	3.38 (.07)	3.41 (.09)	2.98 (.04)	Attention to Positive Affect: $F(1, 802) = 5.35$, $p = .02$, $\eta^2 = .007$ Attention to Negative Affect: $F(1, 802) = 71.13$, $p < .001$, $\eta^2 = .08$ Group: $F(2, 802) = 16.00$, $p < .001$, $\eta^2 = .04$	C < S C < P $T(1, 802) = 4.65$, $p < .001$ $T(1, 802) = 4.28$, $p < .001$
Impulse	2.51 (.05)	2.70 (.08)	2.01 (.04)	Attention to Positive Affect: $F(1, 797) = 1.67$, $p = .20$, $\eta^2 = .002$ Attention to Negative Affect: $F(1, 797) = 34.89$, $p < .001$, $\eta^2 = .04$ Group: $F(2, 797) = 38.49$, $p < .001$, $\eta^2 = .09$	C < S C < P $T(1, 797) = 6.33$, $p < .001$ $T(1, 797) = 7.47$, $p < .001$
Awareness	2.64 (.06)	2.58 (.07)	2.40 (.03)	Attention to Positive Affect: $F(1, 797) = 81.40$, $p < .001$, $\eta^2 = .09$ Attention to Negative Affect: $F(1, 797) = 16.05$, $p < .001$, $\eta^2 = .02$ Group: $F(2, 797) = 7.42$, $p < .001$, $\eta^2 = .02$	C < S $T(1, 797) = 3.54$, $p = .001$
Strategies	2.79 (.06)	2.91 (.08)	2.16 (.04)	Attention to Positive Affect: $F(1, 795) = 1.43$, $p = .23$, $\eta^2 = .002$ Attention to Negative Affect: $F(1, 795) = 86.52$, $p < .001$, $\eta^2 = .10$ Group: $F(2, 795) = 55.92$, $p < .001$, $\eta^2 = .12$	C < S C < P $T(1, 795) = 8.26$, $p < .001$ $T(1, 795) = 8.46$, $p < .001$
Clarity	2.56 (.06)	2.83 (.07)	2.18 (.03)	Attention to Positive Affect: $F(1, 797) = 36.92$, $p < .001$, $\eta^2 = .04$ Attention to Negative Affect: $F(1, 797) = 11.03$, $p < .001$, $\eta^2 = .01$ Group: $F(2, 797) = 33.92$, $p < .001$, $\eta^2 = .08$	C < S C < P S < P $T(1, 797) = 5.55$, $p < .001$ $T(1, 797) = 8.02$, $p < .001$ $T(1, 797) = 2.94$, $p = .01$

Note. C = Controls; P = PerMag; S = SocAnh.
$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$.

APPENDIX B.

TABLE B Proportions of change in estimates of group differences of high-arousal ideal affect and ER difficulties after accounting for attention to affect

Group differences in ideal affect and emotion regulation difficulties	Proportion of change in estimates (% of change)
High-arousal positive affect	
(S vs. C)**	.49 (49%)
(P vs. C)	.87 (87%)
Low-arousal positive affect	
(S vs. C)	.56 (56%)
(P vs. C)	.44 (44%)
High-arousal negative affect	
(S vs. C)	.74 (74%)
(P vs. C)***	.14 (14%)
Low-arousal negative affect	
(S vs. C)	.41 (41%)
(P vs. C)	.22 (22%)
Nonacceptance	
(S vs. C)***	.15 (15%)
(P vs. C)***	.11 (11%)
Goals	
(S vs. C)***	.08 (8%)
(P vs. C)***	.11 (11%)
Impulse	
(S vs. C)***	.12 (12%)
(P vs. C)***	.10 (10%)
Awareness	
(S vs. C)***	.47 (47%)
(P vs. C)	.31 (31%)
Strategies	
(S vs. C)***	.11 (11%)
(P vs. C)***	.12 (12%)
Clarity	
(S vs. C)	.33 (33%)
(P vs. C)***	.15 (15%)

Note. Included are the estimates comparing both schizotypy groups with controls from the ANCOVA. S = SocAnh; P = PerMag; C = Controls.
*$p < .05$; **$p < .01$; ***$p < .001$.