

# The Relationship between Dimensions of Schizotypy and Alexithymic Deficits

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## Introduction

Schizotypy represents a set of cognitive and behavioral features thought to reflect risk toward schizophrenia-spectrum psychopathology<sup>1</sup>. As is the case with schizophrenia, current models support a multidimensional structure for schizotypy<sup>1</sup>:

- A positive dimension characterized by odd beliefs, perceptual disturbances and paranoia.
- A negative dimension characterized by anhedonia, flat affect, avolition, and social disinterest.
- A disorganized dimension characterized by difficulties in organizing thought, speech and behavior.

Emotional processing disturbances have been found to co-occur high levels of schizotypy<sup>2</sup>; among these, however, alexithymia represents a class of emotion-processing disturbance that remains largely unexplored in schizotypy research<sup>2</sup>. Although the structure of alexithymia is still debated<sup>3</sup>, it can be understood to encompass:

- A cognitive dimension characterized by difficulties in identifying, analyzing and verbalizing feelings.
- An affective dimension characterized by diminished emotionalizing and fantasizing.

Previous studies have found significant bi-variate correlations between schizotypy and alexithymia components<sup>4,5,6</sup>. To our knowledge, however, no previous studies have examined independent contributions of schizotypy dimensions toward components of alexithymia (i.e. accounted for overlap between schizotypy dimensions).

We hypothesized that:

1. (a) Positive, (b) negative and (c) disorganized schizotypy will positively correlate with cognitive alexithymia.
2. (a) Positive and (b) disorganized schizotypy would negatively correlate with affective alexithymia while (c) negative schizotypy will exhibit a positive correlation.

## Methods

### Participants:

- 1416 undergraduate participants completed our online battery.
- 95% of sample ranged from 18 to 27 years of age.

	N (%) / Mean (SD)		N (%) / Mean (SD)	
Gender	Schizotypy			
Female	1072 (75.91%)	Positive	3.89 (4.28)	
Male	329 (23.23%)	Negative	4.21 (4.44)	
Age	20.68 (3.77)	Disorganized	4.33 (5.64)	
Race	Alexithymia			
Caucasian	516 (36.44%)	Cognitive	57.28 (16.05)	
African American	70 (4.94%)	Affective: Dim. Emotionalizing	19.13 (5.52)	
Asian	671 (47.38%)	Affective: Dim. Fantasizing	18.78 (6.48)	
Other	143 (11.21%)	Affect		
Ethnicity				
Hispanic	243 (17.16%)	Positive	33.97 (7.31)	
Non-Hispanic	1173 (82.83%)	Negative	24.07 (7.80)	

### Measures:

#### Multidimensional Schizotypy Scale (MSS)<sup>7</sup>:

- Consists of 3 subscales measuring positive, negative, and disorganized subclinical traits. Items are rated True (1) or False (0).

#### Bermond-Vorst Alexithymia Questionnaire (BVAQ)<sup>8</sup>:

- Consists of 5 subscales measuring difficulties in identifying, analyzing and verbalizing feeling, and diminished emotionalizing and fantasizing. Items are rated according to a 5-point Likert scale. Factor analytic studies<sup>9</sup> have confirmed the presence of two higher-order factors: cognitive and affective alexithymia.

#### Positive Affect Negative Schedule (PANAS)<sup>10</sup>:

- Consists of 2 subscales measuring tendency to experience positive and negative emotions (i.e. trait version). Items are rated according to a 5-point Likert scale.

### Analyses:

- Alexithymia scores were regressed onto schizotypy dimension scores in three Multiple Regression models. Models were subsequently adjusted for positive and negative affect.
- Due to low correlation between subscales of affective alexithymia dimension ( $r = .15$ ) these were considered separately (as done in previous research<sup>11</sup>). Cognitive alexithymia subscales were strongly correlated ( $r > .51$ ).
- Significance level was set at  $\alpha = .001$

## Results

### Cognitive Alexithymia

Positive Schizotypy			Negative Schizotypy			Disorganized Schizotypy			Positive Affect			Negative Affect			R <sup>2</sup>
$\beta$	$\Delta R^2$	$f^2$	$\beta$	$\Delta R^2$	$f^2$	$\beta$	$\Delta R^2$	$f^2$	$\beta$	$\Delta R^2$	$f^2$	$\beta$	$\Delta R^2$	$f^2$	
0.031	0.001	0.001	<b>0.367*</b>	<b>0.118*</b>	<b>0.176*</b>	<b>0.316*</b>	<b>0.075*</b>	<b>0.112*</b>							0.327
0.053	0.002	0.004	<b>0.283*</b>	<b>0.062*</b>	<b>0.099*</b>	<b>0.258*</b>	<b>0.048*</b>	<b>0.076*</b>	-0.237*	0.044*	0.07*				0.371
0.003	0	0	<b>0.36*</b>	<b>0.114*</b>	<b>0.176*</b>	<b>0.245*</b>	<b>0.039*</b>	<b>0.06*</b>				0.182*	0.025*	0.039*	0.352
0.027	0.001	0.001	<b>0.283*</b>	<b>0.062*</b>	<b>0.102*</b>	<b>0.2*</b>	<b>0.025*</b>	<b>0.042*</b>	-0.221*	0.038*	0.062*	0.158*	0.019*	0.03*	0.39

- Negative schizotypy showed a medium positive relationship with cognitive alexithymia
- Adjustment for positive affect lowered the effect size but this relationship remained statistically significant

- Disorganized schizotypy showed a medium positive relationship with cognitive alexithymia
- Adjustment for both positive and negative affect lowered the effect size, but this relationship remained statistically significant

### Affective Alexithymia: Diminished Emotionalizing

Positive Schizotypy			Negative Schizotypy			Disorganized Schizotypy			Positive Affect			Negative Affect			R <sup>2</sup>
$\beta$	$\Delta R^2$	$f^2$	$\beta$	$\Delta R^2$	$f^2$	$\beta$	$\Delta R^2$	$f^2$	$\beta$	$\Delta R^2$	$f^2$	$\beta$	$\Delta R^2$	$f^2$	
-0.052	0.002	0.003	<b>0.462*</b>	<b>0.188*</b>	<b>0.232*</b>	<b>-0.181*</b>	<b>0.025*</b>	<b>0.03*</b>							0.19
-0.059	0.003	0.003	<b>0.488*</b>	<b>0.184*</b>	<b>0.229*</b>	<b>-0.163*</b>	<b>0.019*</b>	<b>0.023*</b>	0.075	0.004	0.006				0.195
-0.013	0	0	<b>0.47*</b>	<b>0.195*</b>	<b>0.255*</b>	<b>-0.084</b>	<b>0.005</b>	<b>0.006</b>				-0.247*	0.046*	0.06*	0.236
-0.018	0	0	<b>0.488*</b>	<b>0.184*</b>	<b>0.241*</b>	<b>-0.074</b>	<b>0.003</b>	<b>0.005</b>	0.05	0.002	0.003	-0.241*	0.044*	0.057*	0.238

- Negative schizotypy showed a large positive relationship with diminished emotionalizing
- This effect remained stable after adjusting for positive and negative affect.

- Disorganized schizotypy showed a small negative relationship with diminished emotionalizing
- Adjustment for both negative affect attenuated this effect such that this relationship was no longer statistically significant

### Affective Alexithymia: Diminished Fantasizing

Positive Schizotypy			Negative Schizotypy			Disorganized Schizotypy			Positive Affect			Negative Affect			R <sup>2</sup>
$\beta$	$\Delta R^2$	$f^2$	$\beta$	$\Delta R^2$	$f^2$	$\beta$	$\Delta R^2$	$f^2$	$\beta$	$\Delta R^2$	$f^2$	$\beta$	$\Delta R^2$	$f^2$	
<b>-0.266*</b>	<b>0.058*</b>	<b>0.064*</b>	0.022	0	0	-0.051	0.002	0.002							0.082
<b>-0.271*</b>	<b>0.06*</b>	<b>0.066*</b>	0.043	0.001	0.002	-0.036	0.001	0.001	0.061	0.003	0.003				0.085
<b>-0.25*</b>	<b>0.05*</b>	<b>0.055*</b>	0.025	0.001	0.001	-0.012	0	0				-0.098*	0.007*	0.008*	0.089
<b>-0.256*</b>	<b>0.052*</b>	<b>0.057*</b>	0.043	0.001	0.002	-0.002	0	0	0.051	0.002	0.002	-0.093	0.006	0.007	0.091

- Positive schizotypy showed a medium negative relationship with diminished fantasizing
- This effect remained stable after adjusting for positive and negative affect.

Note: Significant effects of interest are shown in **bold**. Attenuation of effects in adjusted models is shown in **red**. \*  $p < .001$

## Conclusions

- Negative schizotypy was a strong predictor of reduced emotionalizing irrespective of emotional valence. Its positive relationship with cognitive alexithymia was only partially explained by diminished positive affect. These effects in conjunction suggest that research into negative schizotypy would greatly benefit from importing concepts from alexithymia research (e.g., suppression as an emotion regulation strategy<sup>11</sup>).
- Disorganized schizotypy was a moderate predictor of cognitive alexithymia and increased emotionalizing. The overlap between these effects and positive and negative affect suggests that levels of positive and negative emotion may act as a potential mediator in the relationship between disorganized schizotypy and alexithymia. Further research should examine mechanisms linking impaired cognitive control and emotion perception in relation to schizotypy and alexithymia.
- Positive schizotypy did not exhibit a unique relationship with alexithymic deficits except for correlating with increased fantasizing. There is current debate<sup>3</sup>, however, on the appropriateness of considering diminished fantasizing as a component of alexithymia. In this context, our results suggest that alexithymia does not play a central role in positive schizotypic experiences.
- Due to the cross-sectional design of the present study, direction of causality could not be determined. However, we hope that our findings inform future longitudinal and mechanistic research studies on the contribution of alexithymia in psychosis risk.

## References

1. Thomas R. Kwapi, Neus Barrantes-Vidal, Schizotypy: Looking Back and Moving Forward, *Schizophrenia Bulletin*, Volume 41, Issue suppl. 2, 1 March 2015, Pages S366–S373
2. Gjakouraki, S. G. (2018). Emotion processing deficits in the different dimensions of schizotypy. *Scandinavian Journal of Psychology*, 57(3), 256–270.
3. Preece, D., Becerra, R., Robinson, K., Dandy, J., & Allan, A. (2018). The psychometric assessment of alexithymia: Development and validation of the Perth Alexithymia Questionnaire. *Personality and Individual Differences*, 132, 32–44.
4. van 't Wout, M., Aleman, A., Kessels, R. P., Larai, F. & Kahn, R. S. (2004). Emotional processing in a non-clinical psychosis-prone sample. *Schizophrenia Research*, 68, 271–281.
5. Gouding, D. C. & Tallet, K. A. (2003). Spatial, object, and affective working memory in social anhedonia: An exploratory study. *Schizophrenia Research*, 63, 247–260.
6. Larai, F., Van der Linden, M., & Aleman, A. (2008). Associations between dimensions of alexithymia and psychometric schizotypy in nonclinical participants. *Journal of Nervous and Mental Disease*, 196, 927–930.
7. Kwapi, 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.
8. Vorst, H. C. M. (2001). Validity and reliability of the Bermond–Vorst Alexithymia Questionnaire. *Personality and Individual Differences*, 30(3), 413–434.
9. Bermond, B., Clayton, K., Liberova, A., Luminet, O., Maruszewski, T., Bili, P. E. R., Rine, B., Vorst, H. H., Wagner, H., & Wicherts, J. (2007). A cognitive and an affective dimension of alexithymia in six languages and seven populations. *Cognition and Emotion*, 21(5), 1125–1136.
10. Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063–1070.