

# Mediating role of childhood abuse for the relationship between schizotypal traits and obsessive-compulsive disorder

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## Abstract

**Background:** The mediating role of childhood trauma in the relationship between schizotypal symptoms and obsessive-compulsive disorder (OCD) was not sufficiently investigated to date. **Objectives:** In the present study, our major goal was to analyse the mediator role of childhood abuse (emotional, physical, and sexual), and neglect (emotional and physical) on the link between schizotypal symptoms and OCD, after controlling for duration of OCD, the mean number of comorbid Axis I disorders, and current anxiety. **Methods:** One hundred fifteen patients (aged 18-65 years) who had primary diagnosis of OCD and Yale-Brown Obsessive-Compulsive Scale score  $\geq 16$  were assessed using the short form of Childhood Trauma Questionnaire questionnaire (CTQ-SF), Schizotypal Personality Questionnaire (SPQ), and Beck Anxiety Inventory (BAI). **Results:** The all types of schizotypal symptoms were significantly correlated with the scores of childhood abuse and neglect, and BAI. The childhood abuse as a mediator significantly predicted the total YBOCS scores ( $p = 0.02$ ) after when BAI scores were controlled. However, childhood neglect was not multivariately related to current OCD severity, and did not mediate the relationship between schizotypal traits and total YBOCS scores. **Discussion:** We suggested that childhood trauma mediated the schizotypal traits in relationship with current OCD severity independent from anxiety severity.

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**Keywords:** Obsessive-compulsive disorder, childhood trauma, schizotypal traits.

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The obsessive-compulsive disorder (OCD) is a psychiatric disorder characterized by obsessions and/or compulsions, which affects 1%-3% of the population through the world<sup>1</sup>. There is growing evidence of differences in demographic and clinical characteristics of OCD patients with and without schizotypal traits, indicating a schizotypal subgroup of OCD<sup>2-8</sup>. Schizotypal traits emerged as a potent predictor of OCD symptoms relative to depression or general anxiety<sup>2,4,9</sup>. The term “schizotypal” describes psychopathological characteristics that are chronic, and stable over time and are assumed to represent an inherited general vulnerability to psychopathology that falls between healthy conditions and severe mental illness<sup>9,10</sup>. Cognitive-perceptual (positive), interpersonal (negative), and disorganization factors were described as prominent schizotypal traits<sup>11</sup>. Several studies demonstrated a link between positive symptoms of schizotypy (magical thinking, unusual perceptual experiences, ideas of reference, paranoid ideations) and OCS<sup>6,8,12</sup>. These patients with OCD and positive symptoms of schizotypy have been found to have more severe OCD symptoms<sup>12-14</sup>, more prominent obsessions<sup>14,15</sup>, a poorer prognosis<sup>13</sup> and an earlier age of onset of their disorder<sup>2,16</sup>. OCD and high-schizotypy has also been associated with specific OCD symptoms such as checking, counting, ordering/arranging, and hoarding<sup>2,3,5</sup>. Autogenous type of obsessions were suggested to be more highly associated with

schizotypal features such as magical thinking, and anomalous perceptions<sup>4</sup>. However, little is known about how schizotypal traits contribute to OCD symptoms. One explanation is that the magical thinking of schizotypy may increase the risk for displaying the cognitive bias of likelihood thought-action fusion (TAF), which in turn may increase the risk for OCD<sup>4</sup>. Schizotypy traits may be linked to OCD symptoms through multiple pathways. In the present study, we supposed that childhood trauma may serve as a mediator on the link between schizotypal traits and OCD. In fact, childhood trauma may cause and contribute to the presence of personality disorders and emotional and behavioural deficits<sup>17</sup>. Some cross-sectional, prospective, and retrospective studies suggested an association between childhood trauma and increased schizotypal traits<sup>18-20</sup>, which could not be accounted for genetic vulnerability alone<sup>20,21</sup>. Emotional abuse, neglect, and stressful childhood events were reported to be strong predictors of schizotypy<sup>22,23</sup>, and may result in structural and functional brain differences that leads to schizotypal symptoms<sup>24</sup>. In general, traumatic experiences during childhood have been much more linked to reality distortion than to negative and disorganized traits<sup>25-27</sup>. A study reported that emotional abuse alone predicted the ideas of reference, excessive social anxiety, a lack of close friends, unusual perceptual experiences and eccentric behaviour or appearance<sup>28</sup>.



Childhood trauma is known to predispose to several mood, anxiety, and personality disorders. Childhood traumatic experiences have also been proposed to play a role in causing or precipitating OCD through some specific personality traits. In OCD patients, neuroticism, extraversion, conscientiousness and agreeableness were reported to be related to childhood abuse, while openness was not<sup>29,30</sup>. However, the mediating role of childhood trauma in the relationship between schizotypal symptoms in OCD patients was not sufficiently investigated to date. Given the paucity of literature in this topic, we conducted a study to analyse the mediator role of childhood abuse (emotional, physical, and sexual), and neglect (emotional and physical) on the link between schizotypal symptoms and OCD. We hypothesized that if childhood trauma is related to schizotypal traits, then even would mediate their relationship with OCD even after controlling for duration of OCD, the mean number of comorbid Axis I disorders, and current anxiety.

## Materials and methods

### Subjects and assessment

A total of one hundred sixty patients (aged 18-65 years) who were OCD-diagnosed according to Structured Clinical Interviews for Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) Axis I Disorders (SCID-I)<sup>31</sup> at the psychiatry department between June 2016 and December 2018 were included in the study. The severity of OCD symptoms were assessed using Yale Brown Obsessive-Compulsive Scale (Y-BOCS)<sup>32,33</sup>. The subjects with total scores  $\geq 16$  were required for study entry ( $n = 115$ ). Patients with current and lifetime diagnoses of mental retardation, bipolar disorder, psychotic disorders, substance use disorders, and organic mental disorders were not included in this study. Institutional ethics committee approval was obtained prior to the study and all participants provided signed informed consent. The sociodemographic and clinical characteristics of participants, including age, sex, educational level, marital status, comorbid diagnoses of Axis I disorder, current severity of anxiety, and duration of OCD were recorded through a semi-structured interview form. The duration of OCD was determined from the age that the patient, or a family member, remembered as the beginning of the OC symptoms as used in previous studies<sup>34</sup>.

To assess experienced maltreatment in childhood and adolescence, we used the short form of Childhood Trauma Questionnaire questionnaire (CTQ-SF) in which the 28 items are rated on a 5-point Likert scale<sup>35,36</sup>. This scale includes the subscales of emotional abuse, physical abuse, sexual abuse, emotional neglect and physical neglect. For the statistical analysis, we summed the first three subscale scores into a variable "childhood abuse". We obtained the variable "childhood neglect" by summing up emotional and physical neglect scores.

Schizotypal Personality Questionnaire (SPQ) was used to assess the severity of schizotypal traits<sup>11,37</sup>. This scale was designed to have one subscale for each of the nine symptoms of schizotypal personality disorder (ideas of reference, excessive social anxiety, odd beliefs and magical thinking, unusual perceptual experiences, odd or eccentric behaviour, no close friends, odd speech, constricted affect, suspiciousness). Items were rated for agreement on a dichotomous scale (Yes/No), with a subscale score computed as the total of all items. Cognitive-perceptual/positive (magical thinking, unusual perceptual experiences, ideas of reference, paranoid ideations), interpersonal/negative (lack of close friends, constricted affect), and disorganized (odd/eccentric behavior, odd speech) dimensions were used in this study.

The severity of current anxiety was measured by Beck Anxiety Inventory (BAI)<sup>38</sup>. The BAI is a 21-item self-report questionnaire designed specifically to distinguish symptoms of anxiety from those of depression over the past week. Each item is scored on a 4-point Likert scale, yielding a total score ranging from 0 to 63.

## Statistical analysis

All analyses were conducted using the SPSS (SPSS Science, Chicago, IL, USA) software, version 21.0. Descriptive analyses on sociodemographic, and clinical factors were conducted in terms of total number of subjects and percentage of sample. Bivariate correlations were used to determine the presence of significant associations between the schizotypal traits and several clinical variables.

The next step in our analysis was related to examine the role of childhood trauma as a mediator between schizotypal traits and the current OCD severity. The mediator is the factor through which a predictor impacts an outcome variable. To prove mediation, we followed a procedure described by Baron and Kenny<sup>39</sup>. We performed three regression equations for both childhood abuse and neglect in predicting their mediations on the relationship between schizotypal traits and current YBOCS scores. According to this model, (a) the independent variable (schizotypal traits) should impact the mediator variable (childhood trauma) in the first equation (path a). (b) The independent variable should impact the dependent variable (YBOCS scores) in the second equation (path c). (c) The mediator should impact the dependent variable in the third equation (path b). (d) The effect of the independent variable on the dependent variable must be less in the third equation than in the second (path c'). Perfect mediation is revealed only if the independent variable has no effect when the mediator is added to the model. The mediator variable, then, serves to mediate the relationship between the independent and dependent variables. Otherwise, it is a partial mediation.

## Results

### Sample characteristics

Statistical analysis was executed on the basis of the data of the 115 subjects, 78 (67.8 %) of which were women. The mean age was 31.8 (SD = 10.3, range = 18-65) years. Forty-nine of our participants (42.6 %) had at least one current Axis I comorbidity. The mean number of current Axis I diagnoses was  $0.52 \pm 0.65$ . Axis I comorbidity included the following current diagnoses: major depression ( $n = 30$ ; 26.8%), generalized anxiety disorder ( $n = 8$ ; 6.9%), panic disorder ( $n = 4$ ; 3.4%), Tourette Disorder ( $n = 3$ ; 2.6%), OCD spectrum disorders ( $n = 4$ ; 3.4%). The mean age at onset of OCD symptoms was 20.3 years old (SD:6.9, range: 5-40). The mean YBOCS scores of the participants were  $33.45 \pm 4.47$  (Table 1).

### Correlation analysis

As can be seen in Table 2, the all types of schizotypal symptoms were significantly correlated with the scores of childhood abuse and neglect, and BAI. There were no significant correlations between the schizotypal symptoms and the duration of OCD. Interpersonal subtype was not found to be correlated with total YBOCS scores.

### Mediated models for childhood abuse and neglect

We did not insert gender, and educational level into analyses, since they were categorical, or not normally distributed. The linear regression analyses showed that total SPQ scores had a unique effect on the childhood abuse ( $B = 0.405$ , 95% CI [0.243-0.565],  $\beta = 0.428$ ,  $t = 4.963$ ,  $p < 0.0001$ ). Total SPQ scores were significantly associated with total YBOCS scores ( $B = 0.084$ , 95% CI [0.016-0.152],  $\beta = 0.224$ ,  $t = 2.438$ ,  $p = 0.016$ ). A hierarchical regression analyses using total YBOCS scores as the outcome variable was performed using the scores of SPQ, childhood abuse, and BAI as predictors. After including childhood abuse, direct effect of schizotypal traits on OCD severity turned out to be nonsignificant ( $B = 0.023$ , 95% CI [-0.065-0.110],  $\beta = 0.060$ ,  $t = 0.513$ ,  $p = 0.60$ ). BAI score was not a significant predictor in the model. The childhood abuse as a mediator significantly predicted the total YBOCS scores ( $B = 0.093$ ,

**Table 1.** Demographic and clinical characteristics of the participants (n = 115)

Variables	Participants	
	m	SD
Age	31.80	10.36
The at onset of OCD	20.35	6.99
Educational level (year)	12.55	3.78
The number of comorbid Axis I disorders	0.52	0.65
BAI	22.07	14.85
YBOCS Total	24.63	5.86
Obsession	12.72	3.29
Compulsion	11.90	3.26
CTQ-SF Total	39.94	14.72
Abuse	22.10	9.47
Neglect	17.88	6.72
SPQ Total	32.13	15.74
Cognitive-perceptual	12.92	7.16
Interpersonal	13.15	6.52
Disorganized	6.05	4.49
	n	%
Gender		
Female	78	67.8
Male	37	32.2
Marital status		
Single	54	47.0
Married	54	47.0
Separated/divorced	7	6.1
Comorbid Axis I Disorders		
Present	49	42.6

OCD: Obsessive-Compulsive Disorder; BAI: Beck Anxiety Inventory; YBOCS: Yale-Brown Obsessive-Compulsive Scale; CTQ-SF: Childhood Trauma Questionnaire Short Form; SPQ: Schizotypal Personality Questionnaire.

**Table 2.** Pearson correlations between SPQ scores and clinical variables

	CTQ-SF Abuse	CTQ-SF Neglect	Duration of OCD	The number of Axis I Dis	BAI	YBOCS
SPQ						
Cognitive-perceptual	0.36***	0.25**	0.01	0.06	0.47***	0.19*
Interpersonal	0.23**	0.35***	0.07	0.18	0.49***	0.11
Disorganized	0.47***	0.34***	0.03	0.13	0.56***	0.32**

\*  $p < 0.05$ . \*\*  $p < 0.005$ . \*\*\*  $p < 0.0001$ .

95% CI [0.006-0.180],  $\beta = 0.232$ ,  $t = 2.115$ ,  $p = 0.03$ ) (Table 3). We suggested that childhood trauma mediated the schizotypal traits in the relation of current OCD severity independent from anxiety severity (Figure 1).

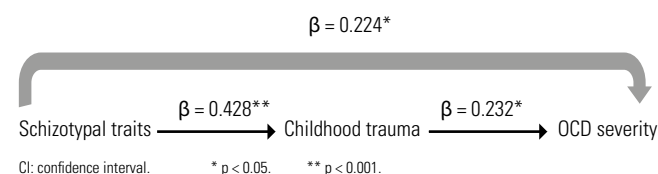
In examining the mediating effects of childhood neglect on the relationship between schizotypal traits and OCD severity, the linear regression analyses showed that total SPQ scores predicted the childhood neglect ( $B = 0.156$ , 95% CI [0.080-0.232],  $\beta = 0.362$ ,  $t = 4.070$ ,  $p < 0.0001$ ). The hierarchical regression revealed that after including childhood neglect, and BAI scores, direct effect of schizotypal traits on OCD severity disappeared ( $B = 0.095$ , 95% CI [-0.088-0.278],  $\beta = 0.087$ -0.110,  $t = 0.513$ ,  $p = 0.60$ ). Neither the mediator or independent variables were associated with the OCD severity. Therefore, we suggested that childhood neglect was not multivariately related to current OCD severity, and did not mediate the relationship between schizotypal traits and total YBOCS scores.

## Discussion

Research examining the factors which are supposed to contribute the relationship between schizotypy and OCD symptoms is limited. Dysfunctional and maladaptive beliefs are supposed to be causal in

**Table 3.** Examining mediator effects using multiple regression

Testing steps in mediation model	$\beta$	S.E	B (95% CI)	t	p
Step 1 (Path a) Outcome: Childhood abuse Predictor: SPQ	0.362	0.038	0.156 (0.080-0.232)	4.070	<0.0001
Step 2: (Path c) Outcome: YBOCS Predictor: SPQ	0.224	0.034	0.084 (0.016-0.152)	2.438	0.01
Step 3 (Path b and c') Outcome: YBOCS Mediator: Childhood abuse Predictors: SPQ BAI	0.253	0.067	0.156 (0.024-0.289)	2.348	0.02
	0.062	0.044	0.062 (-0.063-0.110)	0.538	0.59
	0.107	0.048	0.107 (-0.053-0.138)	0.883	0.13
Step 1 (Path a) Outcome: Childhood neglect Predictor: SPQ	0.362	0.038	0.156 (0.080-0.232)	4.070	<0.0001
Step 2: (Path c) Outcome: YBOCS Predictor: SPQ	0.224	0.034	0.084 (0.016-0.152)	2.438	0.01
Step 3 (Path b and c') Outcome: YBOCS Mediator: Childhood neglect Predictors: SPQ BAI	0.106	0.092	0.033 (-0.055-0.122)	1.026	0.30
	0.087	0.045	0.095 (-0.088-0.278)	0.745	0.45
	0.176	0.047	0.070 (-0.024-0.164)	1.480	0.14

**Figure 1.** Statistical mediation model.

the development of a greater prevalence of OCD symptoms<sup>40</sup>. Lee *et al.*<sup>4</sup> suggested that the magical thinking characteristics of schizotypy may increase the risk for OCD through the increased likelihood of TAF. According to the authors, TAF is associated with a set of cognitive biases that involve faulty causal relationships between one's own thoughts and external reality. In the present study, we investigated whether childhood abuse and/or neglect would mediate the relationship between schizotypy traits and OCD. First of all, we explored the relationship of schizotypal traits with several variables including the duration and severity of OCD, anxiety levels, childhood abuse and neglect. In consistent with some previous studies<sup>4-6,8,12,15</sup>, our results demonstrated that positive and disorganized schizotypal traits were significantly related to the current OCD severity. We have also found that current anxiety scores may interact between schizotypal symptoms and the current OCD severity. Childhood trauma can contribute to the development of bizarre and unusual perceptions and beliefs<sup>14,19</sup>, and cognitive disorganisation<sup>41</sup>. In line with previous findings<sup>18,19,21,42</sup>, our findings indicated that there was an association between two types of childhood trauma (abuse

and neglect) and increased positive, negative, and disorganized schizotypal traits. Therefore, these results are not in line with previous hypothesis which proposed that negative/disorganized schizotypal symptoms are more associated with alterations in early brain development, whereas positive symptoms are influenced more by environmental risk factors such as childhood trauma<sup>43,44</sup>. There is some evidence of a differential effect of trauma on schizotypy, with especially strong predictors being emotional abuse<sup>28</sup> and neglect<sup>18</sup>. In fact, Johnson *et al.*<sup>21</sup>, found that childhood verbal abuse was associated with increased levels of schizotypal symptoms even after taking into account physical abuse, sexual abuse, and neglect. A previous study found that the association of emotional abuse with schizotypy remained significant even after adjusting for different types of childhood trauma<sup>45</sup>. Emotional abuse alone also predicted ideas of reference, excessive social anxiety, a lack of close friends, unusual perceptual experiences and eccentric behaviour or appearance<sup>28</sup>. Another study reported that physical and sexual abuse were associated with higher levels of paranoia/suspiciousness and unusual perceptual experiences<sup>46</sup>. Our results seemed to be inconsistent with some of the previous studies which identified that neglect was associated with positive and negative schizotypy whereas childhood emotional and physical abuse were only associated with the positive schizotypy dimension<sup>47</sup>. In a similar study, the subjects who reported emotional abuse did not show higher scores within any of three measures of schizotypy<sup>46</sup>.

Taking into account the strong correlations between two types of childhood trauma and three schizotypal dimensions, we supposed that childhood abuse and/or neglect may contribute to the influence of schizotypal traits on OCD. The mediation analysis revealed that childhood abuse mediated the relationship between schizotypal traits and OCD even after controlling for current anxiety scores. Similar to our results, a previous study<sup>29</sup> demonstrated that childhood trauma, particularly emotional abuse had significant association with OCS independent from comorbid anxiety. The authors also suggested that there was an indirect relationship between emotional abuse and OCS mediated through the personality traits of conscientiousness. We found that although childhood neglect was significantly correlated with all types of schizotypy, it did not mediate the relationship between schizotypal traits and OCD. Furthermore, we suggested that schizotypal traits were not associated with OCD severity when childhood neglect and current anxiety were controlled. Some previous research reported that childhood neglect appeared to be central in the development of schizotypy<sup>21,48</sup>. Our findings may suggest that although childhood neglect seemed to be related with schizotypal symptoms, it did not have a mediator role in further establishing of a relationship between OCD and schizotypal traits.

## Conclusions

We believe that our study provides a substantial support to the primary hypothesis that childhood abuse experiences may mediate the relationship of schizotypal traits with OCD independent from higher levels of anxiety. The present findings may contribute to the literature by exploring the differential effects of specific trauma types in terms of mediators leading to schizotypal symptoms. Given that childhood emotional abuse may play a particularly important role in the development of psychopathology, longitudinal research examining the potential link between childhood emotional abuse, schizotypal traits and OCD is needed.

## Limitations

The most obvious limitation in this research was that the number of participants was relatively small to adequately address the research questions or to possibly generalize beyond the context of this study. The use of self-report scales may have led to over-reporting of some symptoms and psychopathology. Also, the self-report instruments about childhood adverse experiences may suffer from the bias of memory and the bias of attributing meaning to the events lived by

the respondent. We did not assess the duration and frequency of traumatic experiences, or the age when trauma first occurred. The role of gender, and educational level in moderating the relationship between study variables were not measured, since these variables were categorical or not normally distributed. Additionally, the neglect of the content of lifetime obsessions and compulsions, and the current diagnosis of depression in analyses is another limitation of this study. Moreover, the data on comorbid diagnoses may not be sufficient, since they were collected in an interview, and not be checked in medical records.

## Conflict of interests

The authors declare no conflict of interest.

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