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The Relationship of Hoarding Symptoms to Schizotypal Personality and Cognitive Schemas in an OCD Sample

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Hoarding is a severe and prevalent psychiatric condition characterized by significant difficulties with discarding ordinary possessions, as well as interfering levels of clutter in one's living space (Frost, Steketee & Tolin, 2012). Traditionally conceptualized as a symptom subtype of obsessive-compulsive disorder (OCD; Mataix-Cols, Rosario-Campos, & Leckman, 2005), hoarding has been considered treatment refractory to standardized interventions (e.g., psychopharmacology and cognitive-behavioral therapy; Rufer, Fricke, Moritz, Kloss, & Hand, 2006). More recently hoarding has been shown to occur with and without other OCD symptoms (Frost, Steketee, & Tolin, 2011; Pertusa et al., 2008) and has been associated with distinct phenomenological, neurobiological and genetic substrates (for a review see Pertusa, Frost, Fullana, et al., 2010). Accordingly, hoarding, considered to be a variant of the obsessive-compulsive (OC) spectrum, has been classified as its own disorder within the OC-spectrum category of DSM-5 (APA, 2013).

Ongoing characterization of individuals who hoard across multiple phenomenological manifestations (e.g., hoarding without OCD, hoarding with OCD) helps advance understanding and treatment of these symptoms. One area of focus has been the association of hoarding symptoms with Axis II psychopathology. Prior studies of non-clinical and clinical OCD samples (which have included people with hoarding symptoms) have found an association with schizotypal personality traits (SPT) and schizotypal personality disorder (SPD) (Aardema & Wu, 2011; Lee, Lee, Kim, Kwon, & Telch, 2005; Matsunaga, Hayashia, Kiriike, Nagata & Stein, 2010; Sobin et al., 2000). SPT in OCD has been associated with a unique neurocognitive substrate (e.g., deficits in neuropsychological tasks associated with the orbitofrontal and dorsolateral prefrontal cortex (DLPFC) versus orbitofrontal alone; Harris and Dinn, 2003) and has also been demonstrated to be a predictor of poor treatment outcome (Huang, Hwang, Huang, & Hwu, 2008; Jenike, Baer, Minichiello, Schwartz, & Carey, 1986; Moritz et al., 2004; Poyurovsky et al., 2008).

OC symptoms more traditionally associated with magical or unrealistic thinking (e.g., aggressive, sexual and religious obsessions) have been thought to have a particularly strong connection with the presence of SPT which are also characterized by magical or bizarre

thinking patterns (Dickey et al., 2005; Kendler, McGuire, Gruenberg, & Walsh, 1995). However, only one study of clinical OCD patients thus far has demonstrated an elevated rate of aggressive obsessions in OCD patients with SPT versus without SPT (Sobin et al., 2000). Another study failed to find differences in the frequency of these obsessions for OCD patients with and without SPD (Poyurovsky et al., 2008). Interestingly, in several studies of OCD patients where hoarding was conceptualized as a symptom of OCD, hoarding was consistently associated with SPT (Frost, Steketee, Williams, & Warren, 2000) or SPD (Matsunaga, Hayashia, Kiriike, Nagata, & Stein, 2010; Samuels, Bienvenu, Pinto et al., 2008). In another study by Grisham, Brown, Savage, Steketee & Barlow (2007), patients recruited primarily for hoarding symptoms (but among whom 56.7% had at least one clinically significant non-hoarding OCD obsession or compulsion) had greater rates of SPT versus participants with anxiety disorders or community controls.

While it is difficult to draw general conclusions from these studies because of the sampling differences, the association of hoarding symptoms with SPT/SPD is intriguing and deserves further investigation. Hoarding symptoms appear to share similar characteristics with SPT/SPD, including social isolation and paranoid thinking (Dickey et al., 2005; Frost et al., 2000; Grisham, Steketee, & Frost, 2008; Kendler, McGuire, Gruenberg, & Walsh, 1995; Samuels, Bienvenu, Grados et al., 2008). In addition, research suggests that for one-fourth of individuals with OCD plus hoarding, the hoarding symptoms are driven by bizarre or magical thinking associated with OCD (e.g., throwing an item away will cause harm to the person it is associated with; Pertusa et al., 2008; Pertusa, Frost, & Mataix-Cols, 2010). Despite prior studies linking hoarding symptoms and SPT or SPD, recent studies have left unclear whether other non-hoarding OC symptoms, as well as common co-morbid mood and anxiety symptoms, contribute to the link to SPT/SPD.

Evaluating hoarding as a predictor of SPT in OCD (compared to OCD without hoarding) can further aid in elucidating a potential connection of hoarding symptoms to SPT. The finding of a direct connection between hoarding and schizotypal traits in OCD could provide justification for further exploration of shared etiological mechanisms between hoarding and SPT (e.g., common neurocognitive substrates), as well as treatments that target these symptoms. An examination of hoarding and SPT in an OCD sample could provide a comparison for other groups (e.g., hoarding without OCD, hoarding with comorbid OCD).

If hoarding symptoms predict schizotypal traits in OCD, it will also be important to examine potential mediators. Early maladaptive schemas (EMS) are core beliefs thought to affect all cognition (including memories and emotions; Jovev & Jackson, 2004; Young, 1990); to develop as a result of unmet emotional needs in childhood and to result in maladaptive coping styles and subsequent personality pathology (Haaland et al., 2011). Schemas have been shown to have differing associations with a number of psychiatric disorders and to be a general vulnerability factor for psychopathology (Hawke, Provencher & Arntz, 2011; Pinto-Gouveia, Castilho & Galhardo, 2006; Thimm, 2011). Early maladaptive schemas have been previously associated with both OCD and schizotypal personality. Two studies of OCD found high levels of the following schemas: unrelenting standards, self-sacrifice, social isolation, vulnerability to harm and pessimism (Atalay, Atalay, Karahan, & Caliskan, 2008; Lochner et al., 2005). In addition, cluster A personality disorders, including SPD, have been

correlated with the social isolation EMS (Reeves & Taylor, 2007). If schemas mediate the relationship of hoarding symptoms to SPT traits in OCD, these might be important areas for further exploration and treatment development. Possible candidate schemas include social isolation (e.g., feeling different and alone) and mistrust/abuse (e.g., expecting others will harm the respondent; Jovev & Jackson, 2004)

The aims of the current study were to (a) examine the associations between obsessive-compulsive symptoms and schizotypal personality traits, with a particular focus on hoarding; (b) to determine whether hoarding symptoms predicted variance in schizotypal personality traits; and (c) to examine whether EMSs partially mediated the relationship between hoarding symptoms and schizotypal traits in OCD. It was predicted that (a) hoarding symptoms would be significantly associated with schizotypal personality traits and to a greater extent than with other symptoms of OCD; (b) hoarding symptoms would be related to schizotypal personality traits when controlling for other associated OCD symptoms, as well as mood and anxiety; and (c) certain EMSs (social isolation and mistrust/abuse) would partially mediate the relationship between hoarding symptoms and schizotypal traits in OCD.

Methods

Participants

The study sample consisted of 38 individuals whose data was combined from two treatment outcome studies of cognitive therapy for OCD (Wilhelm et al., 2009). The study and subsequent analyses were approved by the Hospital Institutional Review Board. All study participants met *DSM-IV* diagnostic criteria for OCD (without primary hoarding symptoms) and were required to have an Yale-Brown Obsessive Compulsive Scale (YBOCS, see Measures section) severity score of 16 or higher at pre-treatment. Diagnostic measures for hoarding disorder (HD) were not available at the time of this study (Pertusa et al., 2008). All of the participants in both phases of the study completed the measures as listed below at pre-treatment, except for the Young Schema Questionnaire (YSQ, see Measures section), for which participants in Phase I and participants in Phase II completed different versions. Further details are listed below under the description of the Young Schema Questionnaire. Individuals were excluded from the study for the following: severe psychiatric symptoms requiring hospitalization, organic brain injuries or dysfunction (dementia, brain injury, severe cognitive dysfunction or mental retardation) and/or a diagnosis of Tourette's Disorder.

The sample was 54% female, primarily Caucasian (95%) with a mean age of 32.6 years. Nearly half (47%) had at least one comorbid Axis I disorder. Thirteen individuals (34% of the sample) were taking medications including antidepressants ($n = 12$) and benzodiazepines ($n = 4$).

Measures

Structured Clinical Interview for DSM-IV-Patient Version (SCID-P; First, Spitzer, Gibbon and Williams, 1995)—The SCID-P is a rater administered, semi-

structured interview designed to assess for the presence of DSM-IV diagnoses. As reported previously (Wilhelm et al., 2009), in a subset of the data for the CT for OCD trial, there was a high level of inter-rater agreement ($\kappa = 1.00$) for OCD diagnosis ($\kappa = 1.00$) based on the rating of 20% of the tapes by an independent doctoral level clinician.

Yale-Brown Obsessive Compulsive Scale (Y-BOCS; Goodman et al., 1989)—

The Y-BOCS is a 10-item clinician administered measure of OCD severity, with a score of 16 or higher indicating clinically significant symptoms of OCD. The measure has shown good psychometric properties. Inter-rater reliability for a subset of the data for the CT for OCD trials was high ($r = .97$).

Obsessive Compulsive (OC) Checklist Rating Scales-Patient Version (Yovel et al., 2012)—

The OC Checklist Rating Scales are a self-report measure designed to assess for obsessions and compulsions and derived from the Y-BOCS. The measure asks individuals to rate the severity of obsessions and compulsions (frequency and distress) on an 11-point scale from 0 (*no problem at all*) to 10 (*very severe*). Prior psychometric analyses have shown good reliability and validity for this measure (Yovel et al., 2012). For this investigation obsessions and compulsions were combined to form subtypes based on previously identified OCD symptom dimensions (Mataix-Cols et al. 2005). These groupings included: obsessions/checking (harming, sexual, religious, and aggressive obsessions, and checking, reassurance seeking and mental rituals), contamination/cleaning, symmetry/ordering and hoarding. We also included superstitious symptoms as a separate grouping given its association with magical thinking. The obsessions and compulsions were collapsed by forming a composite score in their respective groups. In the obsessions/checking category, the obsession and compulsions with the highest score were chosen to form the representative composite score.

Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI; Beck & Steer, 1987; BAI; Beck, Epstein, Brown & Steer, 1988)—

These 21-item scales are self-report measures of depressive and anxiety symptoms. The scales are well known and have been shown to have good psychometric properties, including strong internal consistency, high test-retest reliability and good construct validity. In this sample, internal consistency was high for both measures (BDI, $\alpha = .89$; BAI, $\alpha = .91$).

Personality Diagnostic Questionnaire-4th Edition (PDQ-4; Hyler, 1994)—

The PDQ-4 is a 99-item, self-report measure that assesses the presence of personality disorder traits. Its psychometric properties have not been well established, but there is some evidence that it has utility as a screening measure for personality disorders (Okada & Oltmanns, 2009). Items on the questionnaire are based on DSM-IV criteria for Axis II disorders and are scored as true/false. Scores for each Axis II disorder are the total number of positively endorsed traits for the diagnosis. For the present study, in addition to the total number of positively endorsed schizotypal traits, we also recorded the threshold for schizotypal personality disorder which required endorsement of at least 5 trait items out of 9 items that comprised schizotypal personality score.

Young Schema Questionnaire-Short (YSQ-S; Young, 1998) and Long Form (YSQ-L; Young & Brown, 1994)—The YSQ-S is a 75-item self-report questionnaire that was developed to measure early maladaptive schemas, characterized as stable cognitive patterns that structure individual perception. Originally developed as a 205-item measure that assessed 16 maladaptive schemas (YSQ-Long Form; Young & Brown, 1994), the YSQ was later revised to the 75-item YSQ-S measuring 15 maladaptive schemas (Young, 1998). Thus, both scales assess 15 schemas via corresponding subscales, each with a total score. Each item is based on a Likert type scale from 1 to 6 with 1 being “not at all like me,” and 6 being “completely like me.” Any items that are scored at a 5 or a 6 are added to the relevant schema count. Each schema has a count score from from 0 to 5 which were used in analyses. The YSQ has shown good reliability, as well as good convergent and discriminant validity (Welburn, Coristine, Dagg, Pontefract & Jordan, 2002), and evidence suggests the long and short forms produce similar results (Stopa, Thorne, Waters & Preston, 2001). Participants in the first phase of the cognitive therapy study completed the YSQ-L and those in the second phase completed the YSQ-S. YSQ-L scores were converted to YSQ-S scores for purposes of this study.

Statistical Analyses

We first examined the relationship between hoarding and schizotypal score (PDQ-4 total schizotypal score) using Pearson product-moment correlation coefficients. Because hoarding symptoms in prior OCD samples have shown an association with mood and anxiety symptoms (Frost et al. 2000) and OC symptoms often co-occur in OCD patients (Foa et al., 1995), we then looked at whether mood, anxiety (as measured by the BDI and BAI respectively) and other OC symptoms (as measured by the OC-Checklist) were potential confounders of the relationship between hoarding and schizotypal score. The relationship between each potential confounder and schizotypal score was quantified using Pearson product-moment correlation coefficients. If there was a significant association with schizotypal score, we then conducted a univariate regression analysis. Candidate covariates were entered into the multivariate model and examined if they confounded the relationship between hoarding and schizotypal score.

Analyses also examined the role of cognitive schemas in the relationship between hoarding and schizotypal score. To test the hypothesis that schemas would be related to hoarding symptoms and schizotypal score, we examined the relationship of EMS to both types of symptoms through correlational analyses. For any EMS that correlated significantly with both hoarding and schizotypal score, analyses then determined whether specific EMS partially mediated the relationship between hoarding and schizotypal score in OCD. All of the analyses were conducted using SPSS 17.0 and used a two-sided $\alpha = 0.05$ for statistical significance.

Results

Preliminary Data

The average scores for OCD symptoms, schizotypal score and mood and anxiety symptoms are presented in Table 1. Median scores and interquartile ranges are presented for the OC

Checklist due to a non-normal distribution. The Y-BOCS mean indicated moderate OCD severity in the sample. Participants endorsed the following OCD symptoms: obsessions/checking (n=37), contamination/ washing (n=27), superstitious obsessions/compulsions (n=22), symmetry/ordering (n=21), and hoarding (n=18). Three participants met the threshold criteria for schizotypal personality disorder (5 symptoms or above) on the PDQ-4, 9 endorsed 3 to 4 traits, 13 endorsed 1 to 2 traits, and 13 individuals endorsed no traits.

OC Symptoms and Schizotypy

The correlations of the PDQ-4 schizotypal scale and OC Checklist scale items are provided in Table 2. As predicted, there is significant evidence of a moderate correlation between total score on the schizotypal scale and hoarding symptoms. Meaning that individuals who had more severe hoarding symptoms on the OC-Checklist, also had a higher number of schizotypal traits. The schizotypal personality disorder score was also correlated significantly with symmetry/ordering symptoms but not with other OC-Checklist symptoms (see Table 2). We did not find a significant association between mood and anxiety symptoms and schizotypal traits and therefore these were not added into the final model. However, a univariate regression analysis revealed a significant linear relationship between symmetry/ordering symptoms and schizotypal score ($\beta = .08$, $SE = .04$, $p = .04$). Hoarding symptoms also correlated significantly with symmetry/ordering symptoms ($r = .45$, $p = .006$). As the severity of hoarding symptoms increased, the number of schizotypal traits also increased after adjusting for symmetry/ordering symptoms (see Table 3).

Schema, Schizotypy and Hoarding

As predicted, there was a significant correlation between the PDQ-4 schizotypal score and YSQ schemas of social isolation and mistrust/abuse (see Table 2). Interestingly, significant correlations were also observed between schizotypal score and the following schemas: emotional inhibition, subjugation, emotional deprivation, insufficient self-control/self-discipline, failure to achieve, and entitlement (see Table 2).

Contrary to prediction, hoarding symptoms failed to correlate significantly with emotional schemas of social isolation and mistrust/abuse. However, hoarding symptoms did correlate significantly with schemas of emotional inhibition and emotional deprivation and to a lesser extent with self-sacrifice; other correlations were not significant (see Table 2).

Early maladaptive schema that were previously linked to both hoarding and schizotypal score (e.g., emotional inhibition, emotional deprivation) were then examined for partial mediating effects between hoarding symptoms and schizotypal traits. The Sobel test (indicated that neither emotional inhibition ($z = .037$, $p > .05$) nor emotional deprivation ($z = .178$, $p > .05$) mediated this relationship).

Discussion

This study examined the relationship between hoarding symptoms and SPT in an OCD sample. Similar to findings from previous studies demonstrating an association between SPT and SPD and hoarding in OCD (Frost et al., 2000; Matsunaga et al., 2010; Samuels, Bienvenu, Pinto, et al., 2008), the relationship between hoarding symptoms and SPT on the

PDQ-4 demonstrated a moderate correlation. In addition, the results from univariate regression showed symmetry/ordering symptoms predicted SPT. In this sample, neither mood nor anxiety symptoms were associated with SPT and thus were not included in the final model. However, perhaps these correlations were not significant due to the nature of the sample (e.g., OCD patients with non-primary hoarding symptoms). It's possible that mood and anxiety symptoms would have a stronger association with SPT in primary hoarding (with and without OCD) samples and this should perhaps be explored in future studies. In the final multivariate linear regression model examining the relationship between hoarding and SPT, hoarding significant predicted SPT after adjusting for symmetry/ordering symptoms.

The link between hoarding and SPT was consistent with past research showing an association between hoarding and SPT in OCD samples (Frost et al., 2000; Samuels, Bienvenu, Pinto, et al., 2008). However, the correlation between SPT and symmetry/ordering symptoms, but not other OCD symptoms more traditionally characterized by "magical thinking", was somewhat unexpected. Some research on clinical and non-clinical OCD samples has previously demonstrated relationships between these type of obsessions (e.g., sexual, blasphemous, aggressive or repulsive obsessions) and SPT (Lee, et al., 2005; Sobin et al., 2000). It is possible that the grouping together of aggressive, sexual and religious obsessions into an obsessions category may have masked correlations between these separate obsessions and SPT. However, research on the link between these types of obsessions and schizotypal personality is still tentative, with at least one prior sample of OCD patients with and without schizotypal personality showing no difference in the frequency of these obsessions (Poyurovsky et al., 2008). More research on the connection of these types of obsessions and schizotypal personality in clinical OCD samples is needed.

The association of hoarding, symmetry/ordering symptoms and SPT in this sample may describe a particular subset of individuals with OCD. Our findings are consistent with prior research that used similar sampling methods in which hoarding was not the primary OCD symptom (Lochner et al., 2008). Perhaps symmetry/ordering obsessions as well as SPT are more likely to occur among OCD patients with secondary hoarding symptoms. Consistent with this idea, Pertusa et al., (2008) found that for 25% of individuals with OCD and hoarding, the hoarding was driven by another OCD symptom that was frequently bizarre in nature (e.g., magical thinking). However, Pertusa et al. failed to find differences in the occurrence of Cluster A traits and personality disorders across various hoarding groups (e.g., hoarding without OCD, OCD with and without hoarding). In contrast, Matsunaga et al., (2010) found that OCD patients with hoarding versus those without had higher rates of SPD. Additionally patients with hoarding symptoms driven by intrinsic reasons for saving had higher rates of SPD compared to patients whose hoarding was driven by another OCD symptom. More research is needed to further delineate rates of SPT and SPD across hoarding samples with and without OCD to determine whether there are differences in etiology and treatment response.

If OCD patients with hoarding symptoms do indeed represent a subtype characterized by schizotypal traits, this could have important implications for understanding psychopathology and treatment. Perhaps this subset of individuals has an underlying neurocognitive substrate

that results in this particular phenomenological expression (e.g., hoarding, symmetry/ordering, schizotypal traits). For example, DLPFC dysfunction has been previously associated with both schizotypal traits (Kingdon, Egan & Rees, 2012; Koretz & Gutheil, 2009) and hoarding symptoms (Tolin et al., 2012; Wang, Seidler, Hall, & Preston, 2012) and may be a target for research. In addition, while standard treatments for OCD have traditionally focused on cognitive restructuring (e.g., Wilhelm et al., 2009) and exposure and response prevention (e.g., Abramowitz, 2006), these treatments may not adequately address schizotypal features, such as perceptual disturbances and paranoid thinking that may result from DLPFC dysfunction. These may require innovative cognitive remediation strategies, such as attention training aimed at shifting attention away from perseverative paranoid ideation (Morris, Griffiths, LePelley & Weickart, 2013).

The current study also examined whether certain early maladaptive schema partially mediated the relationship between hoarding and SPT in OCD. Our original hypothesis, that social isolation and paranoid schemas would partially mediate the relationship between hoarding and SPT was not confirmed. While SPT was significantly associated with both social isolation and mistrust/abuse schemas in this sample, hoarding was not associated with either of these schemas. A lack of association between hoarding and these schemas may have resulted from sample characteristics. Although hoarding symptoms have previously been associated with social isolation and paranoid ideation (Frost et al., 2000; Grisham et al., 2007, 2008; Samuels, Bienvenu, Grados et al., 2008), these characteristics may be more readily linked with pure hoarding samples versus OCD with hoarding. In addition to comparing rates of SPT across various hoarding groups, a possible next step would be to examine the relationship of schema and hoarding in patients presenting with primary hoarding symptoms with and without OCD.

Hoarding and schizotypal symptoms both had significant associations with the emotional inhibition and emotional deprivation schemas. The emotional inhibition schema is defined as the excessive inhibition of spontaneous action, feeling or communication, usually to avoid disapproval by others, feelings of shame or losing control of one's impulses (Young, 1999). The emotional deprivation schema is defined by an expectation that one's desire for a normal degree of emotional support will not be adequately met by others (Young, 1999). The association of hoarding to emotional deprivation and inhibition is intuitively interesting, as excessive attachment to and saving of objects might stem from material deprivation and early attachment problems (e.g., Tolin, Meunier, Frost, & Steketee, 2010). However, neither of these schemas mediated the relationship between the hoarding and SPT. Further study with a primary hoarding sample may help clarify these associations and their importance.

The study had several limitations. The study used existing data from a cognitive therapy trial for OCD in which no participants presented with primary hoarding symptoms. The lack of participants with a principal hoarding diagnosis is a significant limitation to examining hoarding in relation to the personality and schema features studied here and generalizing findings to hoarding samples. The assessment of hoarding symptoms was also limited by the use of the OC-Checklist which is not designed to measure hoarding symptoms as in depth as other measures such as the Hoarding Rating Scale (HRS; Frost et al., 2012) or the Savings Inventory-Revised (SI-R; Frost, Steketee, & Grisham, 2004), and by the lack of a

standardized diagnostic or validated assessment measure for hoarding. Further research on SPT among those with primary symptoms of hoarding, with and without OCD is needed.

An additional measurement limitation was the grouping of OCD subtypes based on the OC-Checklist. The subtype groupings were chosen based on previous factor analyses of OCD symptoms that have found similar dimensions (e.g., obsessions/checking, hoarding, contamination/washing, symmetry/ordering; see Mataix-Cols et al., 2005). However, grouping together aggressive, religious and sexual obsessions into one subcategory may have masked the specific relationship between these individual obsessions and SPT. It may be particularly important to further elucidate this relationship in future studies, given that these obsessions have been previously associated with magical thinking and magical thinking is a central characteristic of schizotypal personality (Dickey et al., 2005; Kendler et al., 1995).

The study was also limited in the assessment of schizotypal personality. Although the PDQ-4 is a well-known and reliable measure of SPD, it is limited by the self-report format. Data were examined dimensionally rather than categorically, as only 3 individuals in the study met threshold criteria (5 or greater symptoms) for SPD. While hoarding symptoms predicted schizotypal traits, it is unclear if hoarding symptoms predict schizotypal personality disorder. Perhaps the relationship between hoarding symptoms and full fledged schizotypal personality disorder is different than with schizotypal personality traits alone. Additionally, recent research in schizotypal personality disorder has suggested that the phenomenon is heterogeneous, containing both positive and negative symptoms (Watson & Naragon-Gainey, 2010), but for this study only the total PDQ-4 schizotypal scale score was examined.

Despite these limitations, the findings of this study could have important implications for the understanding and treatment of hoarding symptoms within OCD. As mentioned previously, hoarding symptoms occurring within OCD may represent a particular subtype of individuals, who express a greater number of SPT than those individuals with hoarding alone or hoarding comorbid with OCD. Further research is needed to compare these groups, and, if OCD with hoarding differs in the occurrence of SPT or SPD, this could have important future implications for the etiology and treatment of hoarding symptoms across populations. In addition, it is important to continue exploring potential mediators between hoarding and Axis II psychopathology, including SPT/SPD, to further our understanding of the psychopathology and treatment implications for hoarding symptoms.

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Table 1

Sample Characteristics

	Mean/Median	Standard Deviation/ IRR (Interquartile Range)
YBOCS (mean, SD)	25.55	4.35
OC checklist (median, IRR)		
OC symptoms		
Contamination/Washing	9.00	15.50
Hoarding	1.50	10.75
Obsessions/Checking	14.00	10.50
Superstitious	6.50	12.50
Symmetry/Order	4.00	14.00
PDQ-4		
Schizotypal Score (mean, SD)	1.68	1.66

Note: YBOCS = Yale-Brown Obsessive Compulsive Scale; OC Checklist = Obsessive Compulsive Checklist; PDQ-4: Personality Diagnostic Questionnaire-Version IV.

Table 2

Pearson correlations between Obsessive Compulsive (OC) Checklist symptoms and PDQ-4 schizotypal score

OC Checklist	Schizotypal Score	
OC symptoms		
Contamination/Washing	.11	
Hoarding	.61**	
Obsessions/Checking	.21	
Superstitious	.16	
Symmetry/Order	.34*	
YSQ	Schizotypal Score	OC Checklist-Hoard
Schema subscales		
Emotional Deprivation	.42*	.43*
Mistrust/Abuse	.40*	.22
Social isolation	.65**	.13
Failure to achieve	.38*	.20
Subjugation	.46**	.19
Self-sacrifice	.26	.34*
Unrelenting standards	.13	-.09
Emotional inhibition	.50**	.49**
Entitlement	.36*	.03
Insufficient self control	.39*	.19

Note: PDQ-4= Personality Diagnostic Questionnaire-Version IV

* $p < .05$

** $p < .01$

Table 3

Multivariate predictors of Schizotypal Traits (Total PDQ-4 Schizotypal Score)

Outcome	Predictor	Estimate (SE)	t-value	p-value
Schizotypal Score	Intercept	.57(.32)	1.82	.10
	Hoarding	.14(.04)	3.78	.00
R ² = .42	Symmetry/Ordering	.03(.03)	.94	.36

Note. PDQ-4= Personality Diagnostic Questionnaire-Version IV