



## Hoarding in children and adolescents with obsessive–compulsive disorder



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### ABSTRACT

Compared to studies in adults, there have been few studies of hoarding in children and adolescents with obsessive–compulsive disorder (OCD). In the current study, we evaluated OCD clinical features, Axis I disorders, and social reciprocity scores in 641 children and adolescents with OCD, of whom 163 (25%) had hoarding compulsions and 478 did not. We found that, as a group, youth with hoarding had an earlier age at onset and more severe lifetime OCD symptoms, poorer insight, more difficulty making decisions and completing tasks, and more overall impairment. The hoarding group also had a greater lifetime prevalence of panic disorder, specific phobia, Tourette disorder, and tics. As measured with the Social Reciprocity Scale, the hoarding group had more severe deficits in parent-rated domains of social communication, social motivation, and restricted interests and repetitive behavior. In a multivariable model, the overall social reciprocity score, age at onset of OCD symptoms, symmetry obsessions, and indecision were independently related to hoarding in these children and adolescents with OCD. These features should be considered as candidate risk factors for the development of hoarding behavior in pediatric OCD.

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### 1. Introduction

Hoarding behavior is characterized by difficulty in discarding possessions, even those that seem useless or of little value to others; such a large number of objects may be accumulated that personal surroundings are cluttered and difficult to use (Frost & Gross, 1993). Hoarding occurs in almost 30% of adults with obsessive–compulsive disorder (OCD) (Steketee & Frost, 2003).

Among adults with OCD, those with hoarding symptoms have, on an average, an earlier age at the onset of OCD, more severe obsessive–compulsive symptoms, greater prevalences of major depression, generalized anxiety, social phobia, and pathological grooming behaviors, more limited insight, and poorer response to treatment. Adults with hoarding also have been found to have greater numbers of obsessive–compulsive, dependent, and schizotypal personality disorder traits (Frost, Krause, & Steketee, 1996; Frost, Steketee, Williams, & Warren, 2000; Mataix-Cols, Baer, Rauch and Jenike, 2000; Mataix-Cols, Marks, Greist, Kobak, & Baer, 2002; Mataix-Cols, Rauch, Manzo and Jenike (1999); Samuels et al., 2002; Samules et al., 2007a).

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Many adults with hoarding report onset of hoarding behavior in early adolescence or younger mean age (11–13 years, in several studies) (Fontenelle, Mendlowitz, Soares, & Versiani, 2004; Grisham, Frost, Steketee, Kim, & Hood, 2006). The factor structure of obsessive–compulsive symptoms in children and adolescents is similar to that in adults, with a distinct hoarding dimension found in almost all studies (Bernstein, Victor, Nelson, & Lee, 2013; McKay et al., 2006; Stewart et al., 2004, 2007). Moreover, the prevalence of hoarding in a population-based sample of 15-year old twins was found to be 3.7% (excluding the criterion for clutter, which is often prevented by parents) (Ivanov et al., 2013), similar to population-based estimates in adults (Iervolino et al., 2009; Mueller, Mitchell, Crosby, Glaesmer, & de Zwaan, 2009; Samuels et al., 2008). However, there have been few studies of hoarding in children and adolescents with OCD (Storch et al., 2011b).

Storch et al. (2007) studied 80 children and adolescents treated at an OCD clinic (age range, 7–17 years) and found that 21% had significant hoarding symptoms, with “worse insight, more magical thinking obsessions, ordering/arranging compulsions, higher levels of anxiety, aggression, somatic complaints, and overall externalizing and internalizing symptoms” than the non-hoarding patients. Mataix-Cols, Nakatani, Micali, and Heyman (2008) factor-analyzed OCD symptoms in 238 children and adolescents (age range, 8–18 years) referred to a pediatric OCD clinic and found that scores on the hoarding/checking dimension were associated with longer duration of illness, increased levels of pervasive slowness, responsibility, indecisiveness, pathological doubt, depression and greater emotional problems, both self-rated and parent-rated. Masi et al. (2010) studied 257 children and adolescents (age range, 6–18 years) referred to a pediatric mood and anxiety service; compared to the other patients, the 15 in whom hoarding was the most severe, stable, and impairing obsessive–compulsive symptom had the most severe and impairing illness, and the greatest prevalence of panic disorder and bipolar disorder. Frank et al. (2014) studied 68 children treated at a pediatric anxiety clinic (age range 4–10 years); compared to the non-hoarding patients, the hoarding group had an earlier age at the onset of their primary diagnosis, a greater prevalence of attention deficit/hyperactivity disorder (ADHD), and a greater prevalence of anxiety disorders (generalized anxiety, social anxiety, or separation anxiety disorders).

The etiology of hoarding is complex, with evidence of involvement of genetic factors (Ivanov et al., 2013; Samuels et al., 2007b), adverse life experiences (Cromer, Schmidt, & Murphy, 2007; Landau, Iervolino, Pertusa, & Santo, 2011; Przeworski, Cain, & Dunbeck, 2014), and deficits in executive functions (Grisham, Norberg, Williams, Certoma, and Kadib, 2010; Mathews, Perez, Delucchi, & Mathalon, 2012; McGrath et al., 2014; Morein-Zamir et al., 2014). Moreover, there is an evidence for an association between hoarding behavior and autism. Hoarding behavior occurs relatively frequently in children and adults with autism spectrum disorders (Bejerot, 2007; McDougle et al., 1995; Ruta, Mugno, D'Arrigo, Vitiello and Mazzone, 2010), and a distinct hoarding dimension has emerged from factor analyses of obsessive–compulsive symptoms in children with autism spectrum disorders (Anagnostou et al., 2011; Scahill et al., 2014). In addition, compared to healthy controls (although not psychiatric controls), adult patients with hoarding disorder are more likely to have autistic traits (Pertusa et al., 2012). However, the relationship between hoarding and autistic traits has been little studied in children and adolescents with OCD.

In the current study, we addressed several of the gaps in the previous literature by investigating hoarding in a large sample of children and adolescents with OCD, and who were not selected for treatment. We employed a social reciprocity questionnaire to evaluate parent-reported autistic traits in the participants. We also used multivariable modeling to evaluate independent risk

correlates for hoarding in this sample. We proposed that, as in adults, OCD-affected children and adolescents with hoarding are clinically distinct from those without hoarding. We tested this hypothesis by comparing OCD clinical features, Axis I disorders, and scores on Social Reciprocity Scales between those with and without hoarding.

## 2. Methods

### 2.1. Participants

The individuals included in the current analyses had participated in one of two multisite, collaborative family/genetic studies of OCD, which have been described in detail elsewhere. In brief, the OCD Collaborative Genetics Study (OCGS) (2001–2006), targeted recruitment on families with OCD-affected sibling pairs, and extended these when possible through affected first- and second-degree relatives (Samuels et al., 2006). The OCD Collaborative Genetic Association Study (OCAS) (2007–2012) targeted recruitment on trios (i.e., an affected proband and both parents), but also included pedigrees with a proband and unaffected sibling, as well as families with multiple-affected members (Mattheisen et al., 2014/in press). Participants were recruited into the studies from outpatient and inpatient clinics, referrals from clinicians in the community, web sites, media advertisements, self-help groups, and annual conventions of the International Obsessive Compulsive Foundation.

To be considered affected, a participant had to meet DSM-IV OCD diagnostic criteria at any time in his/her life (American Psychiatric Association, 1994). Proband was included if, in addition to meeting DSM-IV criteria, their first onset of obsessions and/or compulsions occurred before 18 years of age. Proband with schizophrenia, severe mental retardation, Tourette disorder, or secondary OCD (i.e., OCD occurring exclusively in the context of depression) were excluded. Individuals had to be at least 6 years old to participate in the study. Written, informed consent (for adults and adolescents) or assent (for children) was obtained prior to the clinical interview. The protocol was approved by the institutional review board at each study site.

### 2.2. Measures

As described previously (Samuels et al., 2006), diagnostic assessments were conducted by psychiatrists or PhD-level psychologists, who interviewed participants directly using a semi-structured format for the evaluation of psychopathology. The Schedule for Affective Disorders and Schizophrenia for School-Age Children–Present and Lifetime Version (K-SADS-PL) was used to ascertain and record lifetime psychopathology in children and adolescents (age range, 6–17 years) according to DSM-IV criteria (Kaufman et al., 1997). The OCD section was adapted from the Schedule for Affective Disorders and Schizophrenia–Lifetime Anxiety version (SADS-LA-R) (Mannuzza, Fyer, Klein, & Endicott, 1986) and included detailed screening questions. A similar section was developed for assessing tics, Tourette disorder, and other tic disorders. The Child Yale–Brown Obsessive Compulsive Scale and Symptom Checklist (CY-BOCS) were used for the assessment of OCD symptoms and severity in children (Scahill et al., 1997).

For each obsession and compulsion endorsed by an individual, the examiner asked the individual to rate, for the worst period, the time occupied by the symptom, from 0 (none), 1 (mild, less than 1 h per day or occasional intrusion), 2 (moderate, 1–3 h per day or frequent intrusion), 3 (severe, 3–8 h per day), and 4 (extreme, more than 8 h per day or near constant intrusion). The examiner also rated the level of distress of the individual when experiencing

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