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## A brief interview for assessing compulsive hoarding: The Hoarding Rating Scale-Interview

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### Abstract

The present paper describes the development and validation of the *Hoarding Rating Scale-Interview* (HRS-I), a brief (5-10 minute) 5-item semi-structured interview that assesses the features of compulsive hoarding (clutter, difficulty discarding, acquisition, distress, and impairment). Trained interviewers administered the HRS-I to 136 adults (73 compulsive hoarding, 19 OCD, 44 non-clinical controls) along with a battery of self-report measures. An initial assessment was conducted in the clinic, and a second assessment was conducted in participants' homes. The HRS-I showed high internal consistency and reliability across time and context. The HRS-I clearly differentiated hoarding and non-hoarding participants, and was strongly associated with other measures of hoarding. It is concluded that the HRS-I is a promising measure for determining the presence and severity of compulsive hoarding.

### Keywords

hoarding; obsessive-compulsive disorder; assessment; clutter

## 1. Introduction

Compulsive hoarding is characterized by (a) acquisition of and failure to discard a large number of possessions; (b) clutter that precludes activities for which living spaces were designed; and (c) significant distress or impairment in functioning caused by the hoarding (Frost and Hartl, 1996). A recent epidemiological survey suggested a lifetime prevalence of over 5% (Samuels et al., 2008). Hoarding has been associated with impairment in activities of daily living (Frost et al., 2000), substantial health risks (Steketee et al., 2001), and marked occupational and role impairment (Tolin et al., 2008). Although hoarding has traditionally been considered a subtype or dimension of obsessive-compulsive disorder (OCD), a large percentage of hoarders experience no other OCD symptoms (Frost et al., 2006), and hoarding may be more strongly associated with conditions other than OCD (Wu and Watson, 2005; Meunier et al., 2006).

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It is generally accepted that thorough evaluation of psychiatric disorders includes a structured or semi-structured diagnostic interview as well as self-report questionnaires and behavioral observations (American Psychiatric Association, 2006). Self-report measures of compulsive hoarding such as the Saving Inventory-Revised (SI-R; Frost et al., 2004) and Clutter Image Rating (CIR; Frost et al., 2008), demonstrate good psychometric properties and appear to be useful in clinical and research settings. The CI-R can also be used by clinicians as a direct observation of clutter severity. Similarly, the Activities of Daily Living (ADL; Frost et al., 2004; Steketee et al., 2007) scale can be used as a clinician rating of daily activities affected by hoarding, living conditions, and safety concerns. To date, however, no diagnostic interviews have been developed that assess compulsive hoarding adequately from a categorical (diagnostic) or continuous (severity) perspective. Many previous studies (e.g., Abramowitz et al., 2003; Saxena et al., 2007) have relied on the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS; Goodman et al., 1989), a structured interview designed for OCD, to assess hoarding. Unfortunately, the Y-BOCS symptom checklist contains only two yes/no items corresponding to hoarding obsessions and compulsions. These categorical judgments convey little information about the behavior, and the description given in the checklist does not mention cluttered living spaces as a symptom. Furthermore, the aggregation of various OCD symptoms in determining severity ratings prevents this instrument from accurately assessing hoarding alone.

The aim of the present study was to develop and validate a semi-structured interview for compulsive hoarding that encompasses the relevant dimensions of this condition (clutter, difficulty discarding, excessive acquisition, distress, and impairment). It was predicted that this measure would possess good internal consistency, correlate significantly with measures of hoarding and related impairment, and discriminate between individuals with and without compulsive hoarding. It was further predicted that the individual items would correspond most closely to analogous scales on other measures of hoarding and psychological distress.

## 2. Method

### 2.1. Participants

Participants were 136 adults (age 18 or older), 73 of whom were identified as having compulsive hoarding. Although in most cases group status was unambiguous, when unclear, one of the authors incorporated information from several assessments of hoarding including a lengthy clinical interview,<sup>1</sup> CIR, and SI-R (see below for details). Also included in this study were 19 participants who met criteria for OCD without hoarding and 44 non-clinical control (NCC) participants who denied any history of psychiatric disorder or treatment. Of the 73 hoarding participants, 14 (19%) were recruited as part of a study of cognitive-behavioral therapy; the remaining hoarding participants, as well as all of the OCD and NCC participants, were recruited via newspaper and Internet advertisements as part of a study of the psychopathology of hoarding.

### 2.2. Materials

**Hoarding Rating Scale-Interview (HRS-I)**—The HRS-I (see Appendix A) consists of 5 questions intended to reflect the proposed dimensions of hoarding: Difficulty using living spaces due to clutter, difficulty discarding possessions, excessive acquisition of objects, emotional distress due to hoarding behaviors, and functional impairment due to hoarding behaviors. Each item is rated on a 9-point scale from 0 (none) to 8 (extreme). The interviewer asks the initial questions, probing with follow-up questions (based on clinician

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<sup>1</sup>The clinical interview assessed current living situation, hoarding symptoms (including a room-by-room description of clutter and associated impairment), hoarding-related beliefs, course, family history, and behavioral observations.

judgment) as needed to make an independent rating of severity. A total HRS-I score was derived by calculating the sum of all 5 items. All raters were trained in the use of the HRS-I by one of the study authors (ROF) who developed the initial criteria for the condition and has extensive experience interviewing hoarders.

**Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV; Brown et al., 1994)**

—The ADIS-IV was used to diagnose anxiety (including OCD), mood, somatoform, and substance use disorders and to screen for the presence of psychosis and other conditions. The ADIS-IV has produced good to excellent reliability estimates for the majority of anxiety and mood disorders (Brown et al., 2001). For the present study, hoarding obsessions and compulsions were omitted from the diagnosis of OCD. Experimenters for the present study were trained in the ADIS-IV by staff working with the test developer, and matched a previously-trained rater's diagnoses on 3 consecutive observed assessments.

**Saving Inventory-Revised (SI-R; Frost et al., 2004)**—The SI-R is a 23-item questionnaire with 3 factor-analytically defined subscales for Clutter, Difficulty Discarding, and Acquisition. It showed good internal consistency and test-retest reliability, as well as known groups validity and concurrent and divergent validity in clinical and non-clinical samples.

**Clutter Image Rating (CIR; Frost et al., 2008)**—The CIR is a pictorial measure of clutter severity rated by the participant in the clinic and during the home visit, and by the interviewer during the home visit. This scale contains three cards, each containing 9 equidistant, standardized photographs of severity of clutter, with one card for each of three main rooms of most people's homes: living room, kitchen, and bedroom. Participants and independent raters select the photograph that most closely resembles the level of clutter in each room of the participant's home. Previous research indicates strong internal consistency, test-retest reliability, and inter-rater reliability. Convergent validity is evident in the CIR's stronger correlations with measures of clutter than with other hoarding and psychopathology scales (Frost et al., 2008). Participants completed the CIR in the clinic and in the home; the experimenter also completed the CIR in the home.

**Beck Depression Inventory-II (BDI-II; Beck, Steer, and Brown, 1996)**—The BDI-II is a 21-item self-report inventory that measures the severity of depression and reflects DSM-IV criteria for a major depressive episode. It shows good internal consistency and has reasonable construct validity (Beck, Steer, Ball et al., 1996; Beck, Steer, and Brown, 1996).

**Beck Anxiety Inventory (BAI; Beck et al., 1988)**—The BAI consists of 21 items that assess the severity of self-reported anxiety. Each item describes a particular symptom. The BAI shows high internal consistency and satisfactory test-retest reliability (Beck et al., 1988).

**Obsessive Compulsive Inventory-Revised (OCI-R; Foa et al., 2002)**—The OCI-R is an 18-item self-report measure of OCD symptoms containing Hoarding, Checking, Neutralizing, Obsessing, Ordering, and Washing subscales. These subscales showed good internal consistency, test-retest reliability, and convergent validity with other measures of OCD symptoms (Foa et al., 2002).

### 2.3. Procedure

All study procedures were approved by the Institutional Review Boards at Hartford Hospital, Smith College, and Boston University; participants signed an informed consent

document prior to study activities. Study procedures were identical for all groups. Participants were reimbursed \$20 per hour for their time.

The first assessment took place in the clinic. Participants completed a battery of self-report measures as well as demographic questions. Trained interviewers ( $N = 13$ ) with at least a bachelor's degree in psychology administered all interview measures (see Table 1 for a list of all clinic and in-home assessments). After the clinic assessment, a second interview and self-report battery was administered in the participant's home 1 to 12 weeks after the clinic assessment. Raters completed the HRS-I in the same fashion as in the clinic, although the rater now had the benefit of viewing the participant's home while making ratings. The home visit rater was typically the same interviewer who completed the initial baseline rating and therefore unfortunately, was not blinded to the initial ratings.

### 3. Results

#### 3.1. Sample characteristics

As shown in Table 1, hoarding, OCD, and NCC participants did not differ in terms of gender, ethnicity (White/Nonwhite), employment status, or education (college graduate or greater). OCD participants were significantly younger on average than were hoarding or NCC participants. Hoarding participants were more likely than were OCD or NCC participants to describe themselves as disabled.

As expected, hoarding participants scored higher on all measures of compulsive hoarding (SI-R, CIR, OCI-R hoarding scale) than did OCD or NCC participants, who did not differ from each other. Hoarding participants also reported higher levels of depression (Mildly Depressed range on the BDI-II) than did OCD or NCC participants (Minimally Depressed range). Hoarding and OCD participants did not differ in levels of anxiety (Mildly Anxious range on the BAI), and both groups scored higher than did NCC participants (Minimally Anxious range). OCD participants scored higher than did NCC participants on all OCI-R scales (with the exception of hoarding); hoarding participants also scored higher than did NCC participants on the OCI-R subscales Checking, Neutralizing, Obsessing, and Ordering. Eleven (15%) of the hoarding participants were also diagnosed with OCD.

#### 3.2. Internal consistency

Internal consistency (Cronbach's  $\alpha$ ) of the HRS-I completed in the clinic was high,  $\alpha = 0.97$ . Inter-item correlations ranged from 0.77-0.91. At the home visit, internal consistency was also high,  $\alpha = 0.96$ , with inter-item correlations ranging from 0.76-0.96.

#### 3.3. Test-retest and cross-context reliability

Reliability analyses for HRS-I ratings completed in the clinic and at home are shown in Table 2. These reliability analyses vary across time (1 to 12 weeks), and across contexts (clinic vs. home). Given the differences between these two administrations, correlations were remarkably high (range 0.85 - 0.94 for corresponding items, and 0.96 for the total score). Partial correlations, controlling for the number of days elapsed between assessments, yielded similar results.

#### 3.4. Known groups validity

Table 3 depicts scores on the HRS-I for hoarding and non-hoarding participants. Groups differed significantly on each item and on the total HRS-I score. In the clinic analyses, Tukey HSD *post hoc* tests indicated that hoarding participants scored higher on all items and on the total score than did OCD or NCC participants, who did not differ from each other. Identical results were obtained during the home visit. These analyses were conducted again

using analyses of covariance (ANCOVAs), controlling for age, gender (dummy coded), and race (White vs. NonWhite, dummy coded), with identical results (not shown).

Receiver Operating Characteristic (ROC) analysis was conducted to determine the capacity of the HRS-I items and total score to discriminate between hoarding and OCD participants. For items 1-5 and the total score, areas under the curve were 0.98 (standard error [SE] = 0.01), 0.98 (SE = 0.01), 0.93 (SE = 0.02), 0.99 (SE = 0.01), 0.98 (SE = 0.01), and 0.99 (SE = 0.01), respectively (all  $ps < 0.001$ ), suggesting good discrimination. Analysis of the sensitivity and specificity of each potential cutoff score suggested that a cutoff score of 3 yielded optimal sensitivity and specificity for item 1 (sensitivity = 0.97, specificity = 0.97), item 4 (0.93 and 0.97), and item 5 (0.96 and 0.95). The optimal cutoff score for item 2 was 4 (0.92 and 0.93), and the optimal cutoff score for item 3 was 2 (0.93 and 0.80). For the total HRS-I score (sum of all 5 HRS-I items), the optimal cutoff score was 14 (0.97 and 0.97).

### 3.5. Convergent validity

Pearson correlations between HRS-I scores and the other measures of hoarding severity are shown in Table 4. Each HRS-I item, as well as the total score, correlated significantly and positively with each of the other hoarding measures in the clinic. The same pattern of results was found in the home visit. Results in either analysis did not change when controlling for age, gender (dummy coded), and race (dummy coded) using partial correlation coefficients (not shown). Examination of scatterplots (not shown) revealed no clear outliers.

### 3.6. Discriminant validity

To examine the relationship between the 3 corresponding HRS-I and SI-R subscales (Clutter, Difficulty Discarding, Acquiring), we computed partial correlations between each pair of subscales, while controlling for the other two SI-R subscales (see Table 5). For clinic ratings, the HRS-I Clutter scale correlated only with SI-R Clutter when controlling for the other SI-R subscales. HRS-I Difficulty Discarding correlated significantly with SI-R Clutter and Difficulty Discarding (but not SI-R Acquiring). HRS-I Acquiring correlated significantly with SI-R Difficulty Discarding and Acquiring. All three HRS-I items showed the strongest relationship with their corresponding SI-R subscale. In-home ratings yielded a similar pattern (with the exception that HRS-I Acquiring did not correlate significantly with SI-R Difficulty Discarding), despite the fact that one measure (SI-R) was conducted in the clinic, and the other (HRS-I) was conducted later in the home. In both assessments, the general pattern is of a stronger association for like subscales than for unlike subscales.

As Table 6 indicates, The HRS-I items and total score did not show strong correlations with the Checking, Neutralizing, Obsessing, or Washing subscales of the OCI-R. HRS-I scores did correlate significantly with the OCI-R Ordering subscale, although the strength of the correlations was modest and substantially lower than were the correlations between the HRS-I and measures of hoarding depicted in Table 4. The HRS-I items and total score correlated significantly with depression and anxiety as measured by the BDI-II and BAI, although these correlations too were substantially lower than those in Table 4. This pattern of findings was replicated in the home visit. To examine the independence of these correlations, a stepwise regression analysis of the clinic variables was conducted, with OCI-R Ordering, BDI-II, and BAI scores as predictors, and HRS-I total score as the dependent variable. Of these three predictor variables, only BDI-II independently predicted HRS-I scores ( $b = 0.61$ ,  $t = 8.79$ ,  $p < .001$ ). Thus, the modest relationship between ordering and HRS-I scores was no longer significant when controlling for depression.

## 4. Discussion

The HRS-I shows promise as both a diagnostic instrument and as a means for determining the severity of compulsive hoarding. The present results suggest good reliability and validity; although not formally assessed in the present study, the utility of the HRS-I is also likely high, given its short administration time (generally 5-10 minutes). The HRS-I adds to the current battery of reliable and valid measures for compulsive hoarding, which include self-report measures (SI-R, CIR) and observer ratings (CIR, ADL). The addition of a semi-structured interview allows for thorough assessment in keeping with current practice guidelines (American Psychiatric Association, 2006) without having to use the Y-BOCS or other measures that were originally designed to assess OCD, rather than compulsive hoarding. It is particularly advantageous that the HRS-I can be used not only to verify that an individual meets current criteria for hoarding, but also to determine the severity of hoarding symptoms. An encouraging finding is the fact that HRS-I ratings comport well with scores obtained using lengthier or more burdensome measures, such as the CIR rated by a clinician in the home.

A limitation of the present study is the fact that the clinic and home visit administrations crossed time and context, precluding precise identification of the test-retest reliability of the HRS-I. However, the fact that correlations were high despite these differences in administration speaks to the strong reliability of this measure. Our use of the same rater for the clinic and in-home assessments is a further limitation, as raters' knowledge of the clinic assessments may have confounded ratings during the home visits. Another limitation is the use of a mainly White, female sample. The gender distribution of hoarding is not clear; in most studies, women represent the large majority of those who seek treatment for compulsive hoarding (Saxena et al., 2002; Saxena et al., 2007; Tolin et al., 2007), although twice as many men as women reported saving worthless objects in a recent epidemiological survey (Samuels et al., 2008). Similarly, although most studies of treatment-seeking or self-identified hoarders include 80-90% White participants (Tolin et al., 2007; Tolin et al., 2008), the epidemiologic survey found no relationship between saving worthless objects and race/ethnicity (Samuels et al., 2008). Concern about this limitation is alleviated somewhat by the absence of any apparent impact of gender or race/ethnicity on the present psychometric findings; however, firmer conclusions about the generalizability of the HRS-I await study in a more diverse sample.

The sensitivity to treatment of the HRS-I has not yet been well documented. However, preliminary analyses from a controlled trial of cognitive-behavioral therapy (Frost et al., 2007) suggest that HRS-I scores decreased following treatment, and that these reductions corresponded to decreases on the SI-R, CIR, and other measures. Thus, although additional research is needed, the HRS-I may be useful for determining the efficacy of treatment for compulsive hoarding.

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## Appendix A: Hoarding Rating Scale-Interview (HRS-I)

1. Because of the clutter or number of possessions, how difficult is it for you to use the rooms in your home?



0 1 2 3 4 5 6 7 8  
 Not at all difficult Mild Moderate Severe Extremely difficult

2. To what extent do you have difficulty discarding (or recycling, selling, giving away) ordinary things that other people would get rid of?

0 1 2 3 4 5 6 7 8  
 No difficulty Mild Moderate Severe Extreme difficulty

3. To what extent do you currently have a problem with collecting free things or buying more things than you need or can use or can afford?

0 1 2 3 4 5 6 7 8  
 No problem Mild, occasionally (less than weekly) acquires items not needed, or acquires a few unneeded items Moderate, regularly (once or twice weekly) acquires items not needed, or acquires some unneeded items Severe, frequently (several times per week) acquires items not needed, or acquires many unneeded items Extreme, very often (daily) acquires items not needed, or acquires large numbers of unneeded items

4. To what extent do you experience emotional distress because of clutter, difficulty discarding or problems with buying or acquiring things?

0 1 2 3 4 5 6 7 8  
 None/not at all Mild Moderate Severe Extreme

5. To what extent do you experience impairment in your life (daily routine, job/school, social activities, family activities, financial difficulties) because of clutter, difficulty discarding, or problems with buying or acquiring things?

0 1 2 3 4 5 6 7 8  
 None/not at all Mild Moderate Severe Extreme

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Table 1

Sample Description

|                                | Source | Hoarding                   | OCD                        | NCC                        | F                    | $\chi^2$          | $\alpha$ |
|--------------------------------|--------|----------------------------|----------------------------|----------------------------|----------------------|-------------------|----------|
| <b>DEMOGRAPHIC INFORMATION</b> |        |                            |                            |                            |                      |                   |          |
| Female (n, %)                  | P, C   | 65 (92.9%)                 | 13 (81.3%)                 | 36 (90.0%)                 |                      | 2.05              |          |
| Age                            | P, C   | 53.37 (9.24) <sup>a</sup>  | 29.88 (11.20) <sup>b</sup> | 50.32 (14.96) <sup>a</sup> | 26.82 <sup>**</sup>  |                   |          |
| White (n, %)                   | P, C   | 63 (90.0%)                 | 16 (100.0%)                | 40 (95.2%)                 |                      | 2.49              |          |
| Unemployed (n, %)              | P, C   | 15 (21.1%)                 | 3 (18.8%)                  | 7 (16.7%)                  |                      | 0.34              |          |
| Disabled (n, %)                | P, C   | 10 (13.7%)                 | 0 (0.0%)                   | 0 (0.0%)                   |                      | 9.32 <sup>*</sup> |          |
| College graduate (n, %)        | P, C   | 49 (71.0%)                 | 9 (56.3%)                  | 26 (61.9%)                 |                      | 1.77              |          |
| <b>STUDY MEASURES</b>          |        |                            |                            |                            |                      |                   |          |
| SI-R Clutter                   | P, C   | 26.23 (6.20) <sup>a</sup>  | 4.11 (6.24) <sup>b</sup>   | 4.25 (6.00) <sup>b</sup>   | 217.55 <sup>**</sup> |                   | 0.98     |
| SI-R Difficulty Discarding     | P, C   | 19.95 (4.59) <sup>a</sup>  | 5.63 (5.49) <sup>b</sup>   | 5.48 (5.34) <sup>b</sup>   | 142.20 <sup>**</sup> |                   | 0.95     |
| SI-R Acquiring                 | P, C   | 16.62 (5.40) <sup>a</sup>  | 5.89 (4.44) <sup>b</sup>   | 4.57 (4.54) <sup>b</sup>   | 91.71 <sup>**</sup>  |                   | 0.92     |
| SI-R Clutter                   | P, H   | 25.70 (6.60) <sup>a</sup>  | 3.89 (6.48) <sup>b</sup>   | 4.39 (5.87) <sup>b</sup>   | 192.63 <sup>**</sup> |                   | 0.98     |
| SI-R Difficulty Discarding     | P, H   | 19.34 (5.00) <sup>a</sup>  | 4.05 (4.94) <sup>b</sup>   | 5.52 (5.80) <sup>b</sup>   | 124.75 <sup>**</sup> |                   | 0.96     |
| SI-R Acquiring                 | P, H   | 15.89 (5.76) <sup>a</sup>  | 4.26 (4.33) <sup>b</sup>   | 4.18 (4.10) <sup>b</sup>   | 88.95 <sup>**</sup>  |                   | 0.92     |
| CIR                            | P, C   | 3.64 (1.55) <sup>a</sup>   | 1.46 (0.71) <sup>b</sup>   | 1.39 (0.70) <sup>b</sup>   | 54.77 <sup>**</sup>  |                   | 0.91     |
| CIR                            | P, H   | 3.75 (1.63) <sup>a</sup>   | 1.46 (0.66) <sup>b</sup>   | 1.30 (0.57) <sup>b</sup>   | 60.98 <sup>**</sup>  |                   | 0.92     |
| CIR                            | E, H   | 3.91 (1.54) <sup>a</sup>   | 1.26 (0.38) <sup>b</sup>   | 1.24 (0.37) <sup>b</sup>   | 89.24 <sup>**</sup>  |                   | 0.93     |
| BDI-II                         | P, C   | 17.89 (11.45) <sup>a</sup> | 8.95 (7.58) <sup>b</sup>   | 3.73 (5.27) <sup>b</sup>   | 32.61 <sup>**</sup>  |                   | 0.94     |
| BAI                            | P, C   | 10.25 (9.97) <sup>a</sup>  | 11.89 (11.13) <sup>a</sup> | 1.52 (2.79) <sup>b</sup>   | 17.00 <sup>**</sup>  |                   | 0.94     |
| OCL-R Checking                 | P, C   | 2.08 (2.55) <sup>a</sup>   | 4.32 (4.01) <sup>b</sup>   | 0.66 (1.48) <sup>c</sup>   | 14.13 <sup>**</sup>  |                   | 0.87     |
| OCL-R Hoarding                 | P, C   | 9.12 (2.76) <sup>a</sup>   | 1.47 (2.41) <sup>b</sup>   | 1.80 (2.35) <sup>b</sup>   | 139.12 <sup>**</sup> |                   | 0.93     |
| OCL-R Neutralizing             | P, C   | 1.36 (2.48) <sup>a</sup>   | 2.53 (3.91) <sup>a</sup>   | 0.14 (0.51) <sup>b</sup>   | 7.69 <sup>*</sup>    |                   | 0.85     |
| OCL-R Obsessing                | P, C   | 1.94 (2.61) <sup>a</sup>   | 6.42 (3.45) <sup>b</sup>   | 0.30 (0.79) <sup>c</sup>   | 43.38 <sup>**</sup>  |                   | 0.88     |
| OCL-R Ordering                 | P, C   | 4.12 (3.04) <sup>a</sup>   | 3.68 (3.73) <sup>a</sup>   | 1.11 (1.37) <sup>b</sup>   | 17.12 <sup>**</sup>  |                   | 0.85     |
| OCL-R Washing                  | P, C   | 0.88 (1.86) <sup>a</sup>   | 4.53 (4.18) <sup>b</sup>   | 0.25 (0.72) <sup>a</sup>   | 29.28 <sup>**</sup>  |                   | 0.88     |

OCD = Obsessive-compulsive disorder. NCC = Nonclinical controls. SLR = Saving Inventory-Revised. CIR = Clutter Image Rating. BDI-II = Beck Depression Inventory-II. BAI = Beck Anxiety Inventory. OCI-R = Obsessive-Compulsive Inventory-Revised. P = Participant, E = Experimenter, C = Clinic, H = Home. Within each row, groups with different superscript letters are significantly different from one another (Tukey HSD follow-up test),  $p < 0.05$ . Figures are presented as mean (standard deviation) unless otherwise noted.

\*  $p < 0.05$ .

\*\*  $p < 0.001$ .

**Table 2**  
 Test-Retest and Cross-Context Reliability of the Hoarding Rating Scale-Interview (HRS-I)

|  | Home Visit      |                       |                 |                 |                 |                 |
|--|-----------------|-----------------------|-----------------|-----------------|-----------------|-----------------|
|  | Clutter         | Difficulty Discarding | Acquisition     | Distress        | Impairment      | Total           |
| Clutter  | <b>0.942</b> ** | 0.884**               | 0.757**         | 0.901**         | 0.945**         | 0.948**         |
| Difficulty Discarding  | 0.840**         | <b>0.882</b> **       | 0.749**         | 0.868**         | 0.866**         | 0.899**         |
| Acquisition  | 0.746**         | 0.764**               | <b>0.851</b> ** | 0.775**         | 0.752**         | 0.826**         |
| Distress   | 0.858**         | 0.874**               | 0.733**         | <b>0.894</b> ** | 0.891**         | 0.910**         |
| Impairment   | 0.903**         | 0.866**               | 0.744**         | 0.883**         | <b>0.933</b> ** | 0.925**         |
| Total  | 0.910**         | 0.905**               | 0.809**         | 0.915**         | 0.931**         | <b>0.955</b> ** |
| Partial Correlations, Controlling for Number of Days Elapsed Between Assessments |                 |                       |                 |                 |                 |                 |
|  | Home Visit      |                       |                 |                 |                 |                 |
|  | Clutter         | Difficulty Discarding | Acquisition     | Distress        | Impairment      | Total           |
| Clutter  | <b>0.926</b> ** | 0.919**               | 0.821**         | 0.913**         | 0.946**         | 0.958**         |
| Difficulty Discarding  | 0.837**         | <b>0.862</b> **       | 0.757**         | 0.802**         | 0.883**         | 0.877**         |
| Acquisition  | 0.819**         | 0.861**               | <b>0.890</b> ** | 0.825**         | 0.849**         | 0.896**         |
| Distress   | 0.859**         | 0.870**               | 0.783**         | <b>0.865</b> ** | 0.907**         | 0.907**         |
| Impairment   | 0.902**         | 0.856**               | 0.757**         | 0.838**         | <b>0.948</b> ** | 0.911**         |
| Total  | 0.919**         | 0.922**               | 0.844**         | 0.897**         | 0.959**         | <b>0.961</b> ** |

\*\*  $p < 0.001$ .

Table 3

Hoarding Rating Scale-Interview (HRS-I) item scores in the clinic and home visit for participants with compulsive hoarding, obsessive-compulsive disorder (OCD), and nonclinical controls (NCC).

|                       | Hoarding                  | OCD                      | NCC                      | F                    | $\eta^2_p$ |
|-----------------------|---------------------------|--------------------------|--------------------------|----------------------|------------|
| <b>CLINIC</b>         |                           |                          |                          |                      |            |
| Clutter               | 5.18 (1.36) <sup>a</sup>  | 0.47 (1.07) <sup>b</sup> | 0.64 (1.06) <sup>b</sup> | 234.55 <sup>**</sup> | 0.78       |
| Difficulty Discarding | 5.10 (1.43) <sup>a</sup>  | 0.84 (1.21) <sup>b</sup> | 0.82 (1.37) <sup>b</sup> | 160.98 <sup>**</sup> | 0.71       |
| Acquiring             | 4.08 (1.88) <sup>a</sup>  | 0.67 (0.84) <sup>b</sup> | 0.75 (1.26) <sup>b</sup> | 74.16 <sup>**</sup>  | 0.53       |
| Distress              | 4.83 (1.33) <sup>a</sup>  | 0.72 (1.41) <sup>b</sup> | 0.73 (1.02) <sup>b</sup> | 180.17 <sup>**</sup> | 0.73       |
| Impairment            | 5.03 (1.43) <sup>a</sup>  | 0.22 (0.65) <sup>b</sup> | 0.42 (1.03) <sup>b</sup> | 236.87 <sup>**</sup> | 0.78       |
| Total                 | 24.22 (5.67) <sup>a</sup> | 2.84 (4.34) <sup>b</sup> | 3.34 (4.97) <sup>b</sup> | 266.26 <sup>**</sup> | 0.80       |
| <b>HOME VISIT</b>     |                           |                          |                          |                      |            |
| Clutter               | 5.14 (1.19) <sup>a</sup>  | 0.26 (0.65) <sup>b</sup> | 0.43 (0.95) <sup>b</sup> | 337.21 <sup>**</sup> | 0.84       |
| Difficulty Discarding | 5.04 (1.22) <sup>a</sup>  | 0.79 (1.27) <sup>b</sup> | 0.77 (1.22) <sup>b</sup> | 200.28 <sup>**</sup> | 0.76       |
| Acquiring             | 3.64 (1.73) <sup>a</sup>  | 0.53 (1.07) <sup>b</sup> | 0.59 (1.06) <sup>b</sup> | 73.83 <sup>**</sup>  | 0.53       |
| Distress              | 5.09 (1.18) <sup>a</sup>  | 0.53 (0.90) <sup>b</sup> | 0.61 (1.26) <sup>b</sup> | 244.16 <sup>**</sup> | 0.79       |
| Impairment            | 4.91 (1.25) <sup>a</sup>  | 0.37 (1.01) <sup>b</sup> | 0.41 (0.90) <sup>b</sup> | 273.98 <sup>**</sup> | 0.81       |
| Total                 | 23.76 (4.53) <sup>a</sup> | 2.47 (4.25) <sup>b</sup> | 2.82 (4.64) <sup>b</sup> | 357.72 <sup>**</sup> | 0.85       |

OCD = Obsessive-compulsive disorder. NCC = Nonclinical controls.

Note: Within each row, groups with different superscript letters are significantly different from one another,  $p < 0.05$ .

\*\*  $p < 0.001$ .

Table 4

Correlations between Hoarding Rating Scale-Interview (HRS-I) items in the clinic and home visit and other measures of hoarding.

| HRS-I Score (Clinic)                |                |                       |                |          |            |                |
|-------------------------------------|----------------|-----------------------|----------------|----------|------------|----------------|
| <i>Measures Completed in Clinic</i> | Clutter        | Difficulty Discarding | Acquisition    | Distress | Impairment | Total          |
| CIR (Participant)                   | <b>0.76</b> ** | 0.65**                | 0.57**         | 0.69**   | 0.71**     | 0.72**         |
| SI-R                                |                |                       |                |          |            |                |
| Total                               | 0.89*          | 0.87**                | 0.78*          | 0.86**   | 0.89**     | <b>0.91</b> ** |
| Clutter                             | <b>0.92</b> ** | 0.84**                | 0.75**         | 0.86**   | 0.90**     | 0.91**         |
| Difficulty Discarding               | 0.83**         | <b>0.87</b> **        | 0.76**         | 0.85**   | 0.85**     | 0.88**         |
| Acquisition                         | 0.77**         | 0.76**                | <b>0.76</b> ** | 0.73**   | 0.79**     | 0.81**         |
| OCI-R: Hoarding                     | 0.88**         | 0.86**                | 0.77**         | 0.85**   | 0.86**     | 0.89**         |
| HRS-I Score (Home)                  |                |                       |                |          |            |                |
| <i>Measures Completed at Home</i>   | Clutter        | Difficulty Discarding | Acquisition    | Distress | Impairment | Total          |
| CIR (Participant)                   | <b>0.83</b> ** | 0.68**                | 0.60**         | 0.71**   | 0.81**     | 0.78**         |
| SI-R                                |                |                       |                |          |            |                |
| Total                               | 0.89**         | 0.90**                | 0.81**         | 0.89**   | 0.90**     | <b>0.94</b> ** |
| Clutter                             | <b>0.92</b> ** | 0.87**                | 0.74**         | 0.90**   | 0.92**     | 0.95**         |
| Difficulty Discarding               | 0.81**         | <b>0.88</b> **        | 0.75**         | 0.83**   | 0.82**     | 0.88**         |
| Acquisition                         | 0.78**         | 0.80**                | <b>0.85</b> ** | 0.79**   | 0.80**     | 0.86**         |
| CIR (Experimenter)                  | <b>0.88</b> ** | 0.71**                | 0.59**         | 0.72**   | 0.83**     | 0.80**         |

Note: CIR = Clutter Image Rating, SI-R = Saving Inventory-Revised, OCI-R = Obsessive-Compulsive Inventory-Revised.

\*\*  
p < 0.001.

**Table 5**

Correlations between the 3 symptom items on the Hoarding Rating Scale-Interview (HRS-I) with corresponding subscales of the Saving Inventory-Revised (SI-R), controlling for other SI-R subscales

| <i>Clinic</i>         |   |   |   |
|-----------------------|---|---|---|
| HRS-I Item            | SI-R Scale (Completed in Clinic)                              |   |   |
| <i>Clinic</i>         | Clutter (Controlling for Difficulty Discarding and Acquiring) | Difficulty Discarding (Controlling for Clutter and Acquiring) | Acquiring (Controlling for Clutter and Difficulty Discarding) |
| Clutter               | <b>0.69**</b>   | 0.12  | -0.14   |
| Difficulty Discarding | 0.31**  | <b>0.46**</b>   | -0.07   |
| Acquiring             | 0.12  | 0.20*   | <b>0.25*</b>  |
| <i>Home</i>           |   |   |   |
| Clutter               | <b>0.70**</b>   | 0.02  | -0.11   |
| Difficulty Discarding | 0.35**  | <b>0.52**</b>   | -0.11   |
| Acquiring             | 0.15  | 0.08  | <b>0.28**</b>   |

\*  $p < 0.05$ .

\*\*  $p < 0.001$ .



Table 6

Correlations between the Hoarding Rating Scale-Interview (HRS-I), completed in the clinic and during the home visit, and non-hoarding measures completed in the clinic

| Clinic            | HRS-I Item (Clinic)   | Measure (Completed in Clinic) |                    |                  |                |               |               |
|-------------------|-----------------------|-------------------------------|--------------------|------------------|----------------|---------------|---------------|
|                   |                       | OCI-R Checking                | OCI-R Neutralizing | OCI-R Obsessions | OCI-R Ordering | OCI-R Washing | BDI-II BAI    |
|                   | Clutter               | 0.04                          | 0.06               | -0.01            | 0.34**         | -0.18*        | 0.56** 0.28** |
|                   | Difficulty Discarding | 0.11                          | 0.21*              | 0.09             | 0.33**         | -0.08         | 0.58** 0.33** |
|                   | Acquiring             | 0.07                          | 0.14               | 0.05             | 0.28**         | -0.09         | 0.48** 0.25*  |
|                   | Distress              | 0.13                          | 0.14               | -0.07            | 0.32**         | -0.11         | 0.59** 0.34** |
|                   | Impairment            | 0.10                          | 0.16               | 0.08             | 0.34**         | -0.12         | 0.62** 0.37** |
|                   | Total                 | 0.08                          | 0.15               | 0.05             | 0.34**         | -0.13         | 0.60** 0.33** |
|                   | Home Visit            |                               |                    |                  |                |               |               |
| HRS-I Item (Home) |                       | Measure (Completed in Clinic) |                    |                  |                |               |               |
|                   | Clutter               | 0.06                          | 0.12               | 0.02             | 0.38**         | -0.16         | 0.61** 0.37** |
|                   | Difficulty Discarding | 0.07                          | 0.13               | 0.02             | 0.39**         | -0.13         | 0.56** 0.30** |
|                   | Acquiring             | 0.01                          | 0.08               | 0.00             | 0.36**         | -0.12         | 0.47** 0.33** |
|                   | Distress              | 0.08                          | 0.07               | 0.00             | 0.34**         | -0.15         | 0.56** 0.30** |
|                   | Impairment            | 0.08                          | 0.14               | 0.03             | 0.39**         | -0.16         | 0.63** 0.40** |
|                   | Total                 | 0.06                          | 0.12               | 0.01             | 0.40**         | -0.15         | 0.61** 0.36** |

Note: OCI-R = Obsessive-Compulsive Inventory-Revised. BDI-II = Beck Depression Inventory-II. BAI = Beck Anxiety Inventory.

\*  $p < 0.05$ .

\*\*  $p < 0.001$ .