The Structured Interview for Hoarding Disorder (SIHD): Development, usage and further validation

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The Structured Interview for Hoarding Disorder (SIHD) is a semi-structured instrument designed to assist clinicians and trained interviewers with the nuanced diagnosis of hoarding disorder (HD). The manuscript introduces the rationale, development, and design of the SIHD and presents a test of the instrument’s inter-rater reliability and convergent/discriminant validity. Ninety-nine individuals with self-reported hoarding behavior, originally recruited as part of a large two-wave epidemiological study, were evaluated in their homes using the SIHD. Diagnoses of HD were determined by consensus, following a best estimate diagnosis procedure. To enable the assessment of inter-rater reliability, a psychiatrist with extensive experience diagnosing HD also independently and blindly reviewed each participant’s SIHD. In addition, agreement of SIHD diagnoses with those indicated by other screening instruments for HD and depression were examined. Results indicate “substantial” or “near perfect” inter-rater reliability for all core HD criteria and specifiers. Convergent and discriminant validity were, furthermore, excellent. Overall, the SIHD offers an intuitive, valid, and reliable means of diagnosing HD. The interview also facilitates the assessment of other relevant features, such as risk. We offer recommendations for its use in both research and clinical settings, as well as suggestions for the training of interviewers.

1. Introduction

The recent inclusion of hoarding disorder (HD) as a new diagnostic category in DSM-5 (American Psychiatric Association, 2013) has underscored the need for valid and reliable tools tailored to the task of its diagnosis. As highlighted in prior research (e.g., Mataix-Cols et al., 2010), since DSM-III “hoarding” has been framed as a symptom (either of obsessive-compulsive disorder [OCD]) or obsessive-compulsive personality disorder [OCPD]) rather than a syndrome unto itself. Consistent with this conception, the assessment of hoarding behaviors has, historically, largely taken place in the context of an alternative condition or construct. For example, the Yale-Brown Obsessive Compulsive Scale (Y-BOCS)—widely viewed as the gold standard for assessing OCD symptom severity—prompts the evaluation of “hoarding and saving obsessions” and “hoarding and collecting compulsions” in its symptom checklist (Goodman et al., 1989, 1989). While it is true that hoarding can be a symptom of OCD (Pertusa, Frost, & Mataix-Cols, 2010), it is increasingly acknowledged that these items fail to capture the core features of the syndrome (i.e., clutter, distress, interference, etc.), and provide an inadequate assessment of the severity of HD (Mataix-Cols et al., 2010).

In the wake of seminal work framing “hoarding” as an independent and definable construct (Frost & Hartl, 1996), the options for assessing hoarding features have expanded. Currently, a number of clinician and self-administered measures exist to assess hoarding features, in particular the severity of aspects such as difficulties discarding, clutter, and distress (for a review see Frost, Steketee, & Tolin, 2012). Some of the most widely used measures include the Hoarding Rating Scale—Interview (HRS-I; Tolin, Fitch, Frost, & Steketee, 2010), the Hoarding Rating Scale—Self Report (HRS-SR, Tolin, Frost, & Steketee, 2010), the Clutter Image Rating (CIR; Frost, Steketee, Steketee, & Renaud, 2008), and the Saving Inventory—Revised (SI-R; Frost, Steketee, & Grisham, 2004). These measures, typically, have empirically derived cut-offs that offer an indication of whether an individual is likely to have clinically-significant hoarding problems. However, while practical—particularly as a means of screening in population-based studies—these tools do not permit a formal diagnosis of HD as they cannot rule out other disorders that may also present with hoarding behavior.
Hoarding disorder is a complex diagnosis, often of exclusion, which requires the careful evaluation of the motivations underlying any hoarding activity. As such, diagnosing HD requires a direct and thorough psychopathological interview, ideally in the sufferer’s living environment. As a diagnosis of HD requires endorsement of all core diagnostic criteria (Table 1), the aim of such an interview is to establish whether these features are present, and to rule out other general medical conditions (e.g., brain injury) and/or psychiatric disorders (e.g., OCD, autism spectrum disorders [ASD], psychosis) which also can account for hoarding behavior. Furthermore, an in-home interview offers the unique opportunity to complete a risk assessment—an important step as the clutter resulting from prolonged hoarding behavior may result in fire hazards, infestations, unsanitary living conditions, and additional health concerns (Snowdon, Pertusa, & Mataix-Cols, 2012; Tolin, Frost, Steketee, Gray, & Fitch, 2008). In some cases, particularly where vulnerable children or elderly persons live in the cluttered property, these risk assessments may highlight the need for further intervention (e.g., fire brigade, social services; Tolin et al., 2008).

We have developed a semi-structured interview that maps directly onto the DSM-5 criteria for HD. The Structured Interview for Hoarding Disorder (SIHD) is intended to assist with the assessment of each diagnostic criterion required to determine an HD diagnosis, as well as the corresponding specifiers. Through a series of skip rules, it also aids clinicians in excluding other possible causes of hoarding with particular emphasis on the differential diagnosis of OCD and ASD (Criterion F). The SIHD also assists with the assessment of risk, and where helpful, may be used in conjunction with additional measures of hoarding severity (e.g., CIR).

While routinely used in all our studies, and in the work of other research groups, there is limited data on this interview’s reliability and validity. The SIHD was recently employed in the London field trial for hoarding disorder (Mataix-Cols, Bilotti, Fernández de la Cruz, & Nordsletten, 2013) and found to reliably discriminate, with high sensitivity and high specificity, between HD and other forms of object accumulation, including normative collecting, sub-clinical hoarding, and hoarding secondary to OCD. Across raters, reliability of the HD diagnosis and each individual HD criterion were also excellent (Mataix-Cols et al., 2013). The current study formally introduces the SIHD, extends investigation of its validity and reliability to a large, population-based sample, and offers practical recommendations for its use in both research and clinical settings.

### Table 1

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<tr>
<td><strong>Criterion</strong></td>
<td><strong>Content</strong></td>
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<tr>
<td>A</td>
<td>Persistent difficulty discarding or parting with possessions, regardless of their actual value</td>
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<tr>
<td>B</td>
<td>This difficulty is due to a perceived need to save items and to distress associated with discarding them</td>
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<tr>
<td>C</td>
<td>The difficulty discarding possessions results in the accumulation of possessions that congest and clutter active living areas and substantially compromises their intended use. If living areas are uncluttered, it is only because of the interventions of third parties (e.g., family members, cleaners, authorities)</td>
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<tr>
<td>D</td>
<td>The hoarding causes clinically significant distress or impairment in social, occupational, or other important areas of functioning (including maintaining a safe environment for self and others)</td>
</tr>
<tr>
<td>E</td>
<td>The hoarding is not attributable to another medical condition (e.g., brain injury, cerebrovascular disease, Prader-Willi syndrome)</td>
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<tr>
<td>F</td>
<td>The hoarding is not better explained by the symptoms of another mental disorder (e.g., obsessions in obsessive-compulsive disorder, decreased energy in major depressive disorder, delusions in schizophrenia or another psychotic disorder, cognitive deficits in major neurocognitive disorder, restricted interests in autism spectrum disorder)</td>
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**Specifiers**

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<td>Excessive acquisition</td>
<td>[To be endorsed] if difficulty discarding possessions is accompanied by excessive acquisition of items that are not needed or for which there is no available space</td>
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<tr>
<td>Level of insight</td>
<td>With good or fair insight: The individual recognizes that hoarding-related beliefs and behaviors (pertaining to difficulty discarding items, clutter, or excessive acquisition) are problematic</td>
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<td>With poor insight: The individual is mostly convinced that hoarding-related beliefs and behaviors are not problematic despite evidence to the contrary</td>
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<td></td>
<td>With absent or delusional insight: The individual is completely convinced that hoarding-related beliefs and behaviors are not problematic despite evidence to the contrary</td>
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*These specifiers are only relevant for individuals meeting criteria A–F for hoarding disorder.*

2. **Methods**

2.1. **Development**

The SIHD was developed in 2010 alongside the drafting of the DSM-5 criteria. It was informed by our substantial experience assessing hoarding difficulties among the several hundred individuals who have participated in the team’s research at the Institute of Psychiatry. Initially the instrument was organized into 3 main subsections designed to assist in: (1) the assessment of core HD diagnostic criteria, (2) the evaluation of HD specifiers, and (3) establishing the differential diagnosis with OCD. As it was, from the outset, intended to be a diagnostic instrument, the content of the SIHD evolved alongside the provisional criteria for HD, with the wording and structure of the current version mirroring key components of the final DSM-5 entry (American Psychiatric Association, 2013). This latest version (version 2.0, available from the authors upon request) includes an additional section to help conduct a risk assessment and an optional appendix to facilitate the differential diagnosis with OCD and ASD.

2.2. **Interview structure and administration**

The first section of the SIHD corresponds directly to the HD diagnostic criteria and its questions are designed to evaluate each of the disorder’s six core features. These items are grouped and labeled by their corresponding criteria (e.g., “Criterion A”) and, as a reference, include the DSM-5 diagnostic wording for the criteria being evaluated (e.g., “Persistent difficulty discarding or parting with possessions regardless of their actual value”). Within each criteria sub-section, the first questions are often close-ended and invite a “yes” or “no” response, with subsequent items requesting clarification or elaboration on the part of the interviewee. Consistent with other widely-used diagnostic interviews (e.g., the Structured Clinical Interview for DSM-IV [SCID]; Spitzer, Williams, Gibbon, & First, 1992; Williams et al., 1992), the SIHD permits the interviewer to supplement these structured questions with his or her own probes, particularly where answers are unclear and clarification is required to make an informed rating.

Psychiatric comorbidities are common in hoarding populations and, in some cases, determining the appropriateness of an HD diagnosis will hinge on the question of whether the hoarding activities are secondary to—or merely comorbid with—an alternative condition (Criterion F). To assist in the parsing process required in such cases, the SIHD includes an optional appendix (the “differential diagnosis assistant”), which is designed to aid raters in distinguishing HD from two conditions where difficulties with differential diagnosis might arise: OCD and ASD. This section includes a series of structured questions relating to the core features of these conditions and their bearing on a sufferer’s hoarding behavior (e.g., “Are your discarding difficulties caused by a specific obsession or fear?”).
In addition to these questions, the assistant provides specific points of comparison that may be useful for distinguishing true HD features from symptoms or behaviors that are better attributed to these alternative conditions. For example, it is known that individuals with ASD may excessively acquire or retain possessions that correspond to a particular sensory preoccupation or “circumscribed interest.” The ASD section of the SIHD, therefore, instructs raters to investigate the relevance of this behavior (e.g., “Do the objects you save largely share a particular, physical characteristic (e.g., material, texture, shape)?”). Then, as a point of reference, the rater is provided with some examples of common sensory preoccupations (e.g., “visual stimuli like shiny objects, blinking lights, etc.”), which may be used as a guide in their interpretation of the patient’s response. As with the main interview, probing in this section is permitted and encouraged where clarification is needed in order to determine the primary diagnosis.

As a diagnosis of HD requires the endorsement of all six criteria, a series of skip-qualities have been built into the SIHD to limit the number of questions required for clear non-cases. However, where answers to an item are unclear or suspect, the rater is encouraged to complete the full interview and examine all available information to determine the proper diagnosis. In the event an HD diagnosis is ultimately determined to be appropriate, the SIHD provides an additional section for assessing the two, requisite, DSM-5 specifiers: “with excessive acquisition” (yes/no) and “level of insight” (good/fair, poor, or absent/delusional) (American Psychiatric Association, 2013). This section should be completed for all HD cases.

Finally, the SIHD includes a risk assessment section, which offers a simple checklist of potential risks in the context of HD. Included in this section are items pertaining to dangerous obstructions (e.g., blocked exits, fall risks), infestations, unhygienic conditions, and other health and wellness issues which may result from severe hoarding activity. These risks should be considered and, where relevant, noted when completing an evaluation for HD.

2.4. Diagnostic procedures

Face-to-face diagnostic interviews were carried out by interviewers trained in administration of the SIHD and the evaluation of HD. The majority of interviews were conducted in the participant’s home (96%), with participants asked to provide photos of their living environment where practical constraints precluded a home visit (Fernández de la Cruz, Nordsletten, Billotti, & Mataix-Cols, 2013). In the first instance, diagnoses were determined via research team consensus. During this process, the primary interviewer (rater 1, AN) and two clinical researchers specializing in HD (LFC, DMC) reviewed all information gathered during diagnostic interviews and collectively arrived at a decision regarding the presence/absence of HD, the endorsement of each criterion, and the relevance of the diagnostic specifiers. In addition to this process, data from the SIHD was blindly examined and independently evaluated by a consultant psychiatrist with extensive expertise in HD (rater 2, AP). This second rater had no involvement in the initial participant assessments or consensus diagnoses and arrived at his own diagnostic determinations based solely on the information recorded during the interview process.

3. Results

3.1. Inter-rater reliability

K coefficients are reported in Table 2. The analyses demonstrated strong agreement between the two raters, with rater 1 and rater 2 largely overlapping on their individual criterion endorsements (range: 93.94–100%). The Kappa’s corresponding to these values indicated “near perfect” agreement in the majority, with agreement on Criterion F (“Hoarding not better accounted for by any one room commonly used as an indicator of significance”) resting at “substantial” (Landis & Koch, 1977). Regarding concurrence on the overall
diagnosis, raters were found to agree in over 95% of the 99 cases, a rate which translated to a "near perfect" K of .87.

Overall, the raters agreed on the presence of HD in 16 individuals (16.2% of the interviewed sample). These cases were split equally among the sexes (8 female, 8 male), and ranged between 23 and 74 years of age (median = 55). In accordance with DSM-5 protocol, the diagnostic specifiers (Table 2) were assessed in these individuals. For excessive acquisition, results indicated an agreement rate of 93.75%, corresponding to an outstanding K value of .96. For level of insight, the rate of agreement was 87.5%, corresponding to a substantial Kappa of .67.

3.2. Convergent and discriminant validity

The diagnostic decisions determined via the SIHD were compared to the potential 'caseness' status indicated by implementing a standard cut-off on the widely used HRS-SR (Tolin et al., 2010). For rater 1 the diagnoses determined using the SIHD were in agreement with those indicated by the HRS-SR in 81.2% of cases (K rater 1 = .39). For rater 2, the rate of agreement was 85.56% (K rater 2 = .48). An additional comparison examining the rate of agreement between the SIHD's evaluation of Criterion C and the rating indicated by a validated clutter measure (CIR; Frost et al., 2008) indicated an agreement rate of 82.83% for rater 1 (K = .51) and 81.8% for rater 2 (K = .44).

To examine the discriminant validity of the SIHD, HD diagnoses determined by the SIHD were compared to instances of major depression indicated by the CIS-R (Lewis et al., 1992). For rater 1, the diagnosis indicated by the SIHD overlapped with the depression diagnosis indicated by the CIS-R in 64.65% of cases (K rater 1 < 0), while for rater 2 the rate of agreement was 66.67% (K rater 2 < 0). Rates for both raters reflect an agreement that is not better than chance, indicating that the constructs assessed by these measures are, as anticipated, divergent.

4. Discussion

The SIHD has been applied in several studies to date, with the current investigation offering an additional test of the instrument's utility for diagnosing HD. Results from the present study indicate that the SIHD offers a highly reliable and valid tool for the assessment of HD, with the resulting diagnoses being highly replicable, relatable to existing hoarding measures, and appropriately divergent from measures of alternative conditions. Taken together with prior studies (e.g., Mataix-Cols et al., 2013; Nordsletten et al., 2013), the evidence suggests that the SIHD represents a useful instrument for evaluating the presence of HD. The following sections describe our experiences relating to the pragmatic use of the SIHD in both research and clinical settings, which we hope will be useful to researchers and clinicians working in this field.

4.1. Importance of home visits, informants, and use of photographs

The SIHD is intended for administration in the sufferer's home environment. In the event that a home visit is not possible, it is recommended that clinicians attempt to gather additional information from reliable informants, such as spouses or other relatives. This practice is particularly important in cases where the sufferer's insight is limited, as the participant's reports may underestimate or misrepresent the significance and consequences of their difficulties (Criterion D; Tolin et al., 2010). Informants may also assist in establishing whether the current symptoms are long-standing or transient (Criterion A), whether third parties have intervened to clear some of the clutter away (Criterion C), and whether there are any serious risks that require addressing. In cases where the sufferer is unwilling or unable to be assessed, it is also possible for the SIHD to be administered to a party familiar with the sufferer's difficulties, modifying the wording of the questions accordingly.

HD is uniquely visual amongst mental disorders. For this reason, in the event the SIHD is completed outside of the home environment, photographs of the patient's homes offer a valuable means of assessing both the presence of clinically significant clutter (Criterion C) and the features of this clutter (Fernández de la Cruz et al., 2013). The CIR (see Section 2.5) offers a means for sufferers, clinicians, or informants to quantify the extent of clutter and its scores correlate well with other measures of hoarding severity (e.g., HRS-SR, SI-R; Frost et al., 2008). However, the use of a standard set of pictures, such as those provided in the CIR, does not permit the assessment of idiosyncratic features in an individual's home—or the risks resulting from these features. Requesting photographs of the environment of interest, directly from patients or informants, may offer a viable alternative or compliment to the CIR. Experts are able to use such photos to discriminate pathological from non-pathological object accumulation, as well as deduce information on disorganization, functionality, and degree of squalor—all of which may provide useful diagnostic clues (Fernández de la Cruz et al., 2013).

In making a diagnostic determination, SIHD users are generally encouraged to examine all available sources of information. In addition to photographs, raters may find that clinical records, referral notes, or input from additional third parties (e.g., family members, medical or social services staff) offer a valuable compliment to the details obtained during interview. Such input is particularly valuable in the event that the sufferer shows poor or absent/delusional insight regarding their hoarding behavior—an issue that is quite common in HD and which may present in more than half of cases (Tolin et al., 2010).

In the event the SIHD is administered to a low-insight individual, discrepancies may be evident between the subject's report and these other sources of information. Presented with this situation, the interviewer should tactfully address the discrepancy and probe for clarification, both from the patient as well as any relevant third parties. It is worth noting that, in the same way insight can bias the response of patients, use of the SIHD on the third party (e.g., spouse, child) requires awareness of the inherent limitations and potential biases of these individuals. Where discrepancies persist, it should be kept in mind that the interviewer's clinical judgment bears weight and should, in some cases, take precedence when reaching a final diagnostic decision.

4.2. Duration of the interview

The time required to complete the SIHD will vary. For clear non-cases, where skip rules are employed and specifiers or differential features need not be assessed, the interview may be administered in as little as 10 min. For potential cases, however, the full interview will need to be completed and its duration will depend more considerably on the features of the individual. The level of probing required will, in particular, differ with each interviewee and, in some cases, will be extensive. In general, the full SIHD will be easily completed in 30 min. However, in the event that a participant has poor insight or complex comorbidities, a longer interview duration may be anticipated. The experience level of the interviewer will also impact duration, with the time required lessening as the clinical experience increases.

4.3. Training requirements

Though the SIHD contains structured questions, the need for thoughtful and targeted probing means that the interview benefits from administration by an individual with clinical exposure to
hoarding cases. A familiarity with basic clinical methods, such that the interviewer is able to comfortably complete a diagnostic assessment, represent an ideal skill set when applying the SIHD. Where such clinical experience is lacking, some baseline training (e.g., study of the DSM casebook) may be necessary to acquaint the interviewer with the assessment process. Such training can be achieved relatively quickly and should be sufficient for familiarizing even lay interviewers with the necessary methods.

As HD is a new diagnosis, it is likely that even skilled clinicians will have limited experience with this disorder. Consequently, training will generally be needed to ensure interviewers are comfortable identifying the clinical features of HD and, in particular, able to differentiate true HD from other condition which may produce hoarding behavior. In studies employing the SIHD to date, training has been lead by an individual with extensive experience evaluating HD (AN in the current investigation). This individual introduces the features of the disorder (e.g., the diagnostic criteria and specifiers) and highlights how they correspond to the design and utilization of the SIHD. This presentation is accompanied by a series of taped interviews with past participants, some of whom were determined to have HD and some whose hoarding behavior was deemed either sub-clinical or attributable to an alternative condition. While listening to the tapes, trainees are asked to blindly render independent diagnoses. Discussing these ratings, as a group, has proved useful for highlighting interview techniques and addressing any instances of rating disagreement to ensure clarity and comprehension.

In cases where study recruitment and HD evaluation extend for a considerable length of time, it is recommended that refresher trainings be carried out. In the current investigation, for example, refresher trainings were carried out at two time points during the year-long recruitment to ensure continuity of a high quality of assessments.

4.4. Limitations and future directions

The SIHD has been applied in several studies to date, and while these and the current investigation support the interview’s validity, the question of the SIHD’s test–retest reliability remains open. Though research consistently suggests that hoarding is a persistent disorder—indeed, diagnosis of HD requires that the core symptoms be present for a prolonged period of time—there is currently no available research which examines the ability of the SIHD to produce repeatable measures from a single or multiple observers. We recommended that work incorporating multiple assessment periods and raters attempt to examine the repeatability of diagnoses determined via the SIHD. Where possible, such work should seek to interview participants in their home environments.

5. Conclusion

The SIHD offers an intuitive and, according to current results and those of prior studies (Mataix-Cols et al., 2013), valid and reliable means of diagnosing HD. The instrument also facilitates the assessment of other relevant features, such as risk, which may be crucial for the case’s clinical management. Ideally, the SIHD should be administered in the person’s home by experienced interviewers, and incorporate all available sources of information. In most cases, its administration is relatively short and lay interviewers can be easily trained to use it reliably.

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