



Perceived and actual information processing deficits in nonclinical hoarding

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ABSTRACT

Cognitive-behavioral models of hoarding disorder have identified information processing deficits of categorization and organization, decision-making and indecisiveness, memory, and attention as contributors to hoarding symptoms. The purpose of the current study was to determine whether deficits of memory, attention, and indecisiveness found in hoarders are also present in nonclinical hoarders. Participants included 36 nonclinical hoarders (“packrats”) and 37 controls low in hoarding symptoms. Participants completed neuropsychological tests of memory, sustained attention, and intelligence as well as a battery of questionnaires assessing various symptoms related to the study hypotheses, including hoarding disorder, obsessive-compulsive disorder, and attention-deficit/hyperactivity disorder (ADHD). Nonclinical hoarders reported higher levels of indecisiveness, more concern about memory and cognitive processes, more ADHD symptoms, and higher levels of impulsiveness on self-report questionnaires; however, they did not display impairments in memory, sustained attention, or impulsiveness on neuropsychological tests. The current study highlights potential risk factors of perceived cognitive deficits in the development of hoarding disorder.

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1. Introduction

Hoarding disorder is characterized by an excessive acquisition and failure to discard objects of limited value, a cluttered living environment, and significant distress or impairment associated with these symptoms (Frost & Hartl, 1996). It is associated with a significant economic and social burden (Tolin, Frost, Steketee, Gray, & Fitch, 2008) and is present in approximately 2–5% of the population (Iervolino et al., 2009; Samuels et al., 2008). The cognitive-behavioral model of hoarding disorder proposes that hoarding stems from four main problem areas: exaggerated emotional attachment to possessions, behavioral avoidance of decision-making regarding possessions, erroneous beliefs about possessions, and information processing deficits (Frost & Hartl, 1996; Frost & Steketee, 1999). Several aspects of information processing have been examined in hoarding samples, including categorization and organization, decision-making and indecisiveness, memory, and attention (Grisham, Brown, Savage, Steketee, & Barlow, 2007; Grisham, Norberg, Williams, Certoma, & Kadib, 2010; Hartl, Duffany, Allen, Steketee, & Frost, 2005; Hartl et al., 2004; Lawrence et al., 2006; Tolin & Villavicencio, 2011b; Tolin, Villavicencio, Umbach, & Kurtz, 2011; Wincze, Steketee, & Frost, 2007).

Underinclusive categorization is a deficit thought to contribute to clutter and saving behavior (Frost & Hartl, 1996). Individuals

with hoarding disorder may feel that objects cannot be sorted into broad categories due to the unique qualities and importance of each item, which often results in numerous piles of items that are not put away because the hoarder has difficulty determining where items should go. An item's unique attributes prompt the individual to closely examine and consider the irreplaceability of the item before discarding. Hoarders and nonclinical hoarders (packrats) take longer sorting objects into categories and group objects into many categories, particularly when sorting personal items (Grisham et al., 2010; Luchian, McNally, & Hooley, 2007; Wincze et al., 2007), suggestive of underinclusive categorization.

Planning and organizational difficulties are also thought to contribute to clutter and saving behavior (Frost & Hartl, 1996). Hoarders have been found to have visual planning and organization difficulties on the Rey-Osterrieth complex figure test (Osterrieth, 1944 in comparison to psychiatrically healthy individuals (Hartl et al., 2004; Tolin et al., 2011); however, when using another test of visual organization, the Hooper visual organization test (Hooper, 1958), Tolin et al. (2011) found that hoarders were more impaired than individuals with OCD, but no worse than psychiatrically healthy individuals. In a study of individuals with late life depression by Mackin, Arean, Delucchi, & Mathews (2011), those with comorbid hoarding disorder performed more poorly on the *Delis-Kaplan executive function system (D-KEFS) card sorting test* (Delis, Kaplan, & Kramer, 2001), a measure of visual-spatial categorization, in comparison to those without hoarding. Results have been mixed on tests of planning ability in hoarding samples (Grisham et al., 2010; Tolin et al., 2011) and research has

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not supported semantic clustering deficits on verbal tasks in this population (Hartl et al., 2004). Taken together, it appears that hoarders may be impaired on visual tests of planning and organization, but not on verbal planning and organization tasks.

Decision-making deficits are hypothesized to contribute to clutter and saving behavior due to difficulties deciding which objects to keep or discard and avoidance of making such decisions due to fears of the consequences of discarding (Frost & Hartl, 1996). In addition, these deficits may be related to excessive indecisiveness, which has also been found in hoarders (Frost & Gross, 1993; Grisham et al., 2010) and nonclinical hoarders (Luchian et al., 2007). Previous research suggests that individuals with hoarding disorder would demonstrate deficient performance on decision-making tasks, including the Iowa Gambling Task (IGT; Bechara, Damasio, Damasio, & Anderson, 1994), as they are sensitive to ventral fronto-limbic regions (Mataix-Cols, Pertusa, & Snowden, 2011); however, research using the IGT has produced mixed results. Lawrence et al. (2006) found impairments in decision-making in OCD patients with hoarding compared to OCD patients without hoarding on the IGT; however, research in samples of primary hoarding disorder has not found impairments in performance on the IGT (Grisham et al., 2007, 2010; Tolin & Villavicencio, 2011a).

Perceived and actual memory problems are hypothesized to influence clutter and saving behaviors as well (Frost & Hartl, 1996). Hoarders may have a lack of confidence in their memory that results in a need for visual cues, preventing hoarders from putting items away. In addition, hoarders may overestimate the importance of remembering information and worry about an inability to recall information once it has been discarded. Hartl et al. (2004) found that compulsive hoarders recall less information on spatial and verbal tasks. Likewise, among individuals with late life depression, a greater proportion of those with comorbid hoarding disorder have displayed impairment on a test of verbal memory in comparison to those without hoarding (71% vs. 46%; Mackin et al., 2011). In contrast to these findings, the hoarding group in Tolin et al. (2011) study did not display impaired verbal or spatial memory in comparison to individuals with OCD or those who are psychiatrically healthy. In addition to actual deficits, Hartl et al., 2004 found that hoarders have less confidence in their memory, more catastrophic assessments of the consequences of forgetting where they placed possessions, and a stronger desire to keep possessions in sight than psychiatrically healthy controls.

The last proposed deficit in this model concerns attention difficulties. Frequent shifting of attention may result in indecision about discarding items or difficulty in following through with organization and discarding (Grisham & Barlow, 2005). Hoarders have been found to have more attention-deficit/hyperactivity disorder (ADHD) symptoms than community controls (Grisham et al., 2007, 2010; Hartl et al., 2005; Tolin et al., 2011) and worse spatial attention than clinical and psychiatrically healthy participants (Grisham et al., 2007). Also, hoarders have demonstrated difficulties with sustained attention and impulsivity on continuous performance tests (CPT). Grisham et al. (2007) found that hoarders had more difficulty initiating response (slow and variable reaction time), difficulty inhibiting pre-potent responses (more errors of commission, which suggests impulsivity), and greater difficulty distinguishing targets and nontargets than clinical and psychiatrically healthy participants. Tolin et al. (2011) found similar results such that hoarders had slower response time for correct responses than psychiatrically healthy individuals; however, their response time did not differ from that of individuals with OCD. They determined that 23% of hoarders, compared to 11% of individuals with OCD and 4% of healthy controls, scored in the impaired range on CPT hit response time (Odds Ratio=5.14 for hoarding vs. non-hoarding participants). These apparent difficulties in sustained attention are consistent with clinical observations suggesting

hoarders have difficulty staying focused on tasks and are easily distracted. Neither Tolin et al., nor Blom et al. (2011), replicated the findings of Grisham et al. (2007) on response inhibition/impulsivity in hoarding.

If information processing deficits in the areas of categorization and organization, decision-making and indecisiveness, memory, and attention, found in compulsive hoarders are related to the etiology of hoarding disorder, these deficits may also be detectable in nonclinical hoarders who do not demonstrate functional impairment in their activities due to symptoms of excessive acquisition, difficulty discarding, or clutter. Recent research has demonstrated the dimensionality of hoarding symptoms (Timpano et al., 2012) and factor analyses of hoarding symptoms have revealed similar findings in both student and hoarding samples (Coles, Frost, Heimberg, & Steketee, 2003; Frost, Steketee, & Grisham, 2004). In student samples, interpersonal stressors have been associated with hoarding severity (Timpano, Keough, Traeger, & Schmidt, 2011). High rates of such stressors have also been found in clinical samples, and have been associated with hoarding symptom onset or exacerbation (Tolin, Meunier, Frost, & Steketee, 2010).

With regards to cognitive deficits, previous research with student samples has demonstrated that nonclinical hoarders display categorization difficulties on behavioral tasks and perceive themselves as being more indecisive than healthy controls (Luchian et al., 2007), findings that are comparable to those from studies using clinical samples (Grisham et al., 2010; Luchian et al., 2007; Wincze et al., 2007). To our knowledge, the presence of perceived and actual deficits of memory and attention has not been examined among nonclinical hoarders who have difficulty with clutter, discarding, or acquiring that does not significantly impair functioning.

The current study sought to assess for the presence of information processing deficits of memory and attention, as well as the perception of difficulties with memory, inattention, and indecisiveness, in an undergraduate sample of nonclinical hoarders. An abundance of research on hoarding disorder is conducted with individuals in their 40s and 50s, likely as moderate symptoms are not reported as occurring until early- to mid-20s and recognition of hoarding symptoms as problematic does not typically occur until age 30–40 (Grisham, Frost, Steketee, Kim, & Hood, 2006). Mild symptoms have been retrospectively reported as occurring during teenage years (Grisham et al., 2006), with an average age of onset between ages 11 and 16 (Tolin, Meunier, et al., 2010). As onset of symptoms typically occurs relatively early in life, it is important to identify risk factors in teens and young adults with subclinical hoarding symptoms prior to the development of more severe hoarding symptoms that cause functional impairment later in life.

We hypothesized that nonclinical hoarders would exhibit both perceived and actual information processing deficits. Specifically, we proposed that: (a) despite demonstrating comparable levels of intelligence, nonclinical hoarders would demonstrate more difficulties with sustained attention, impulsivity, and memory than a control group with no hoarding symptoms; (b) nonclinical hoarders would report more ADHD symptoms, impulsivity, memory and cognitive concerns, and indecisiveness than a control group with no hoarding symptoms; and (c) severity of hoarding would be correlated with poor performance on neuropsychological tasks of attention and memory.

2. Method

2.1. Participants

Participants were recruited from undergraduate psychology courses at Florida State University. Students completed three items from the hoarding rating scale-self-report (HRS-SR), a self-report version of the hoarding rating scale-interview

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