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BRIEF REPORT

Experiential Avoidance in Individuals with Hoarding Disorder

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Abstract Hoarding disorder (HD) has received increased research attention. A cognitive-behavioral model implicates dysfunctional beliefs about possessions in these problems. Although this model has received growing support, other perspectives are needed. A recent investigation in an undergraduate sample reported that experiential avoidance (EA) predicted hoarding symptoms above and beyond hoarding-specific beliefs. The present study attempted to replicate and extend those findings in a clinical sample. We compared individuals meeting diagnostic criteria for HD ($N = 33$) to matched healthy controls ($N = 30$), as well as other anxiety disorders ($N = 32$). Results revealed that the HD group experienced less EA compared to individuals with other anxiety disorders. Compared to healthy control individuals, those with HD experienced heightened EA, but this difference was attributable to group differences in the symptoms of depression, anxiety and stress. Within the HD group, EA was not related to any domain of hoarding symptoms. In contrast, beliefs about possessions predicted hoarding behaviors (particularly excessive acquisition and difficulty discarding) above and beyond general distress. Implications for the role of EA in HD are discussed.

Keywords Hoarding disorder · Saving cognitions · Experiential avoidance

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Introduction

Hoarding, the acquisition of and failure to discard a large number of possessions (Frost and Gross 1993), is increasingly recognized as an important public health concern. Once considered a symptom of Obsessive–compulsive disorder (OCD), a growing body of evidence now suggests that hoarding is a distinct entity (Pertusa et al. 2010). The forthcoming revision to the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) will likely include a new entry, hoarding disorder (HD), in light of this research (Mataix-Cols et al. 2010), with diagnostic features of this condition being (a) persistent difficulty discarding personal possessions even of limited value, (b) accumulation of a large number of possessions that clutter the living/working area and prevent the normal use of the space, and (c) the symptoms cause clinically significant distress or impairment in social, occupational or other functioning.

In preparation for this new diagnostic entity, there has been a spike in hoarding research as the field attempts to better understand this condition. The most comprehensive theoretical account of hoarding problems was developed using elements of cognitive-behavioral models (e.g., Frost and Hartl 1996; Steketee and Frost 2003), which emphasize the role of dysfunctional beliefs and maladaptive patterns of behavior in the maintenance of hoarding symptoms. A key component of this model posits that individuals who hoard hold dysfunctional beliefs about the meaning and importance of their possessions. As a result of these beliefs, discarding possessions is extremely difficult, resulting in behavioral avoidance patterns. Steketee et al. (2003) developed a comprehensive measure of these beliefs, the Savings Cognitions Inventory (SCI), and several empirical investigations have linked these beliefs to hoarding symptoms (Frost et al. 2004; Steketee et al. 2003; Coles et al. 2003; Luchian et al. 2007).

Although correlated, beliefs about possessions do not fully explain hoarding symptoms; and therefore additional approaches could prove helpful in refining our understanding of HD. Experiential avoidance (EA), a construct from the field of acceptance and commitment therapy (ACT; Hayes et al. 1999) is one such construct with the potential to add to our understanding of hoarding symptoms. EA refers to an unwillingness to experience or remain in contact with unpleasant emotions, thoughts, and sensations coupled with deliberate attempts to escape from and avoid these experiences (Hayes et al. 1996). Empirical research has established that EA is associated with increased levels of a variety of psychopathology, including depression, obsessive–compulsive disorder, PTSD and trichotillomania (e.g., Chawla and Ostafin 2007; Hayes et al. 2004; Orsillo and Roemer 2005). EA has also been linked to lower quality of life (Chawla and Ostafin 2007).

There is also preliminary evidence to suggest that EA plays a role in hoarding symptoms. In a previous investigation from our group, we (Wheaton et al. 2011) administered measures of EA, beliefs about possessions, hoarding symptoms and general distress to a large sample of unscreened undergraduates. Results indicated that in this nonclinical sample, EA predicted scores on a self-report measure of hoarding symptoms (particularly excessive acquisition and the accumulation of clutter) above and beyond both hoarding-related beliefs and general distress. It should be noted that the effect size for EA's predictive power was quite small for those hoarding symptoms, and EA was not uniquely associated with self-reported difficulty discarding. However, these results provide preliminary evidence of a link between EA and some components of hoarding symptoms. Further support for the possibility of a relationship between EA and hoarding was provided by a recent study that linked compulsive buying to EA (Williams 2012), as many individuals with HD also suffer from acquisition problems (Steketee and Frost 2003). Similarly, past research has linked hoarding to difficulty tolerating negative emotions, as indexed by constructs such as distress tolerance and anxiety sensitivity (Timpano et al. 2009).

Although the extant literature hints at a possible link between EA and hoarding, further research is needed to verify this association in a clinical sample, especially given the relatively small effect size found the previous investigation (Wheaton et al. 2011). Therefore, in the present study we sought to compare mean levels of EA between individuals with HD, other anxiety disorders, and healthy individuals without any psychopathology in order to determine if there is heightened EA in HD. We administered measures of EA, hoarding symptoms, hoarding-related beliefs, and general distress to individuals with HD and matched healthy controls (HC). To compare HD to other anxiety disorders (AD) we also included EA data collected from a group of patients receiving treatment at an anxiety disorders specialty clinic. We hypothesized that the HD group would show elevated levels of EA relative to the HC group, on par with the AD group. On the basis of the research reviewed above, we also hypothesized that EA would account for unique variance in hoarding symptoms within the HD group.

Methods

Participants

Ninety-five adults participated in the present study. The HD group consisted of 10 men and 23 women (total $n = 33$) meeting the proposed criteria for HD as recommended to the DSM-5 committee (Mataix-Cols et al. 2010). The group had a mean age of 48.81 years (SD = 15.64, range 20–72) and the ethnic composition was as follows: 72.7 % Caucasian, 24.2 % African American, and 3 % Asian/Pacific Islander. The HC group was matched to the HD group based on gender and age and consisted of 11 men and 19 women (total $n = 30$) with a mean age of 42.2 years (SD = 14.0, range 21–69). This group was 80 % Caucasian, 16.7 % African American, and 3.3 % Asian/Pacific Islander. The AD group ($n = 32$) consisted of 15 men and 17 women who received treatment at the Anxiety and Stress Disorders Clinic at the University of North Carolina (Chapel Hill, NC). Anxiety disorder diagnoses within this group were determined using the Anxiety Disorders Interview Schedule (ADIS; Di Nardo et al. 1994) administered by a trained graduate student. Diagnoses included generalized anxiety disorder (n = 10, 31.3 %), OCD (n = 7, 21.9 %), social phobia (n = 8, 25 %), panic disorder with or without agoraphobia (n = 6, 18.1 %), and specific phobia (n = 1, 3.1 %). As shown in Table 1, the HD and HC groups did not differ in terms of any demographic variables. The AD group was younger on average compared to both the HD and HC groups. The AD group was also less ethnically diverse (96.9 % Caucasian).

Procedure

HD and HC of participants were recruited through online postings, mass email requests, and flyers placed throughout the community. Diagnoses of HD were made according to the Structured Interview for Hoarding Disorder (SIHD; Pertusa and Mataix-Cols 2011), a semi-structured interview based on the provisional diagnostic criteria for HD as recommended for publication in DSM-5 (Mataix-Cols et al. 2010). In addition, the Hoarding Rating Scale-Interview (HRS-I; Tolin et al. 2010) was used to confirm a

Table 1 Demographic and clinical characteristics for the hoarding disorder ($n = 33$) healthy control ($n = 30$) and anxiety disorder ($N = 32$) groups

Variable	Hoarding disorder	Healthy control	Anxiety disorder	Test of the difference
Demographics				
Mean age (SD)	48.81 (15.63)[a]	42.2 (14.0)[a]	32.3 (12.64)[b]	$F = 11.19$, $p < .001$
No. female (%)	23 (69.7)	19 (63.3)	17 (53.1)	$\chi^2 = 3.73$, $p > .15$
Ethnicity				$\chi^2 = 7.08$, $p < .05$
Caucasian	24 (72.7)	24 (80)	31 (96.9)	
African American	8 (24.2)	5 (16.7)	1 (3.1)	
Asian	1 (3)	1 (3.3)	0	
Clinical characteristics				
SI-R	60.06 (10.77)	7.57 (5.75)		$t = 24.43$, $p < .001$
AAQ-II	24.12 (10.6)[b]	13.77 (8.09)[c]	29.59 (7.29)[a]	$F = 25.66$, $p < .001$
SCI	105.91 (24.45)	38.0 (12.67)		$t = 14.02$, $p < .001$
DASS-depression	11.76 (10.95)	2.13 (3.36)		$t = 4.81$, $p < .001$
DASS-anxiety	6.06 (5.92)	1.87 (4.2)		$t = 3.26$, $p < .01$
DASS-stress	13.45 (8.88)	7.33 (8.34)		$t = 2.82$, $p < .01$

Means with different superscripts differ based on Tukey's HSD post hoc testing

SI-R Saving Inventory-Revised, *SCI* Saving Cognitions Inventory, *AAQ-II* Acceptance and Action Questionnaire-II, *DASS* Depression Anxiety Stress Scales. Chi Square analysis for ethnicity collapsed categories into Caucasian and non-Caucasian due to imbalanced cell sizes

clinically-significant hoarding problem in the HD group using the optimal cutoff of 14. The Mini International Neuropsychiatric Interview (MINI; Sheehan et al. 1998) was used to insure that the HC group did not suffer from a current psychological disorder. Interview-based measures were administered by Masters' level graduate students being supervised by the senior author. Participants were compensated for their time with $30. Patients in the AD group filled out the EA measure as part of their assessment packet on entry into therapy and provided consent to have their responses used in research. However, due to differences in the questionnaires administered in the anxiety clinic, the other measures were not administered to these patients. The study was reviewed and approved by the University IRB of UNC-Chapel Hill.

Measures

Saving Inventory-Revised (SI-R; Frost et al. 2004)

The SI-R is a 23-item questionnaire designed to measure hoarding symptoms, including Difficulty Discarding, Acquisition, and Clutter. This widely-used measure is a valid measure of hoarding behaviors in both clinical and non-clinical populations (Coles et al. 2003; Frost et al. 2004). The SI-R has been found to have good test–retest reliability and strong internal consistency (Frost et al. 2004). Current recommendations for this measure suggest that a score of 40 differentiates between individuals with and without hoarding problems. All 33 individuals in the hoarding group surpassed this cutoff (one individual enrolled in the study was excluded on this basis). The reliability of the SI-R in the present study was excellent ($\alpha = 0.98$).

Acceptance and Action Questionnaire-II (AAQ-II; Bond et al. 2011)

The AAQ-II is a revision of the original 9-item AAQ (Hayes et al. 2004), a widely-used measure of the construct of EA. Bond et al. (2011) found support for the use of both 10-item and 7-item versions of this scale. The 7-item version of this scale omits positively worded items and has been shown to have greater internal consistency than the 10-item version. Therefore, in the present study we used the 7-item version of this questionnaire. Items are scored such that higher scores indicate more experiential avoidance (e.g., "I'm afraid of my feelings"). Scores on the AAQ-II are highly correlated with those on the original AAQ and have good test–retest reliability and internal consistency (Bond et al. 2011). The AAQ-II has previously been used in several research studies, and has demonstrated adequate psychometric properties and construct validity (e.g., Abramowitz et al. 2009; Manos et al. 2010). The reliability of the AAQ-II in the present study was good ($\alpha = 0.95$).

Saving Cognitions Inventory (SCI; Steketee et al. 2003)

The SCI is a 24-item self-report measure that assesses beliefs related to possessions. Respondents are asked to rate the presence of specific cognitions when deciding

whether to discard a possession on a seven-point likert-type scale (e.g. "Throwing away this possession is like throwing away a part of me"). Items were generated based on the theoretical model of Frost and Hartl (1996). Steketee et al. (2003) found support for the use of an SCI total score and four subscale scores (Emotional attachment, Memory, Control, and Responsibility toward possessions). However, only the total score was used in the present study. The SCI total has been found to be a valid measure of hoarding beliefs with good internal consistency in both clinical (Steketee, et al. 2003) and non-clinical samples (Coles et al. 2003). The reliability of the SCI in the present study was excellent ($\alpha = 0.97$).

Depression Anxiety Stress Scales 21 (DASS-21; Antony et al. 1998)

The DASS-21 is a short form of the original 42-item DASS (Lovibond and Lovibond 1995). The scales comprise three separate subscales, measuring self-reported depression, anxiety, and stress on a 0–4 scale. The DASS-21 subscales have been found to have good reliability and construct validity in both clinical (Page et al. 2007) and non-clinical samples (Henry and Crawford, 2005). The three subscales of the DASS demonstrated acceptable to good reliability in the present study (range in $\alpha = 0.75$–0.93).

Data Analytic Strategy

We first conducted between-group comparisons to examine differences between the HD, AD and HC groups' mean scores on the study measures. Next, as the present study sought to examine EA in a clinical sample, we restricted all subsequent analyses to only the HD group's data. We first computed correlation coefficients to examine zero-order relationships among hoarding-related beliefs (SCI), EA (AAQ-II), and hoarding symptoms (SI-R). Next we computed a series of regression analyses predicting the SI-R total and subscale scores. In each regression model, the DASS subscales were entered in the first step to control the overlap among general distress, hoarding symptoms, and the predictor variables. In Step 2 the AAQ-II was entered in order to test the predictive power of EA. The SCI was next entered in Step 3.

Results

Group Comparisons

Table 1 displays the group mean scores on each of the study measures, as well as the demographic characteristics for each group. The primary analysis was a one way analysis of variance (ANOVA), which revealed significant differences across the groups, $F(2, 94) = 25.66$, $p < .001$. Follow up Tukey's Honestly Significant Difference post hoc tests revealed that both the HD and AD groups had higher mean scores on the AAQ-II compared to the HC group (p's $<.01$). Post hoc comparison revealed that the AD group also scored significantly higher on the AAQ-II than the HD group ($p < .05$). To further investigate the difference in EA between the HD and HC groups, we next computed an analysis of covariance (controlling for the DASS subscales), which revealed that there were no significant differences in EA comparing HC and HD groups once those control variables were accounted for, $F(1, 58) = 2.59$, $p = .11$, $\eta^2 = 0.04$. In contrast, a similar ANCOVA revealed that HD and HC groups still differed in SCI scores after controlling for differences in levels of anxiety, depression and stress (DASS subscales), $F(1, 58) = 121.92$, $p < .001$, $\eta^2 = 0.68$.

Zero-Order Correlations

We computed Pearson zero-order correlations among the study variables in the HD group. Consistent with our hypotheses, scores on the SCI were moderately and significantly correlated with the SI-R total score, $r = 0.57$, $p < .001$ and the Difficult Discarding, $r = 0.53$, $p = .001$ and Excessive Acquisition, $r = 0.50$, $p < .01$ subscales. However, SCI scores were not significantly correlated with the SI-R's Clutter subscale, $r = 0.22$, $p > .2$. Conversely, the AAQ-II was not significantly correlated with the SI-R total score or any of its subscales (range in r's $= 0.1$–0.25, all p's $>.15$). The AAQ-II was however moderately and significantly associated with all three subscales of the DASS (with DASS depression $r = 0.69$, $p < .001$, DASS anxiety $r = 0.49$, $p < .01$, DASS stress $r = 0.59$, $p < .001$). Scores on the AAQ-II were moderately and significantly correlated with the SCI, $r = 0.37$, $p < .05$.

Regression Analyses

We examined the ability of EA and saving cognitions to predict hoarding symptoms through multiple regression analyses. For each analysis, the tolerance diagnostics among predictor variables suggested no problems with multicollinearity. The first model used the SI-R total score as the dependent variable. In step 1, the DASS subscales accounted for 6 % of the variance, but were not significant predictors ($p > .6$). In the second step, the AAQ-II failed to account for significant additional variance ($\Delta R^2 = 0.04$, $p > .25$). In the third and final step, the SCI accounted for an additional 26 % of the variance ($\Delta R^2 = 0.25$, $p < .01$). As is shown in Table 2, the final model accounted for 34 % of the variance in SI-R scores ($p < .05$). Subsequent

analyses were conducted predicting each of the SI-R subscales separately to investigate the possibility that EA differently relates to the three components of hoarding. In each analysis, however, the regression model was identical to that described above.

In predicting the SI-R Difficulty Discarding subscale, the DASS subscales failed to account for significant variance in Step 1 ($R^2 = 0.14$, $p > .2$). In the second step, the AAQ-II did not provide any additional predictive power ($\Delta R^2 = 0.01$, $p > .6$). In third step the SCI accounted for 19 % of additional variance, which was significant ($\Delta R^2 = 0.19$, $p = .01$). The final model accounted for 33 % of the variance ($p < .05$).

In predicting the SI-R Acquisition subscale, in the first step of the model the DASS subscales accounted for 29 % of the variance, which was significant ($R^2 = 0.29$, $p = .02$). In the second step the AAQ-II did not account for a significant portion of additional variance ($\Delta R^2 = 0.01$, $p > .4$). In the final step the SCI predicted significant additional variance ($\Delta R^2 = 0.12$, $p = .03$). The final model accounted for 42 % of the variance ($p < .01$).

In predicting the SI-R Clutter subscale, in the first step of the model the DASS subscales accounted for 11 % of the variance but was not significant ($R^2 = 0.11$, $p > .3$). In the second step the AAQ-II did not account for significant additional variance ($\Delta R^2 = 0.08$, $p > .1$). In the third step the SCI accounted for an additional 9 % of the variance, but this contribution was not significant ($p > .07$). Although the final model accounted for 28 % of the variance, it was not statistically significant ($p = .10$). Subsequently, we re-ran these regressions reversing the order of steps 2 and 3. However, the AAQ-II failed to account for significant variance above and beyond the DASS Subscales for the SI-R total score ($\Delta R^2 = 0.04$, $p = .26$) and each of the SI-R Subscales (range in $\Delta R^2 = 0.01$–0.08, p's $>.05$).

Table 2 Summary statistics for the final step of regression equations predicting SI-R scores

Variable	R^2	Beta	t	p
Predicting SI-R total				
Final model	0.34			<.05
DASS-depression		−0.2	−0 0.82	n.s.
DASS-anxiety		0.04	0.2	n.s.
DASS-stress		−0.03	−0.12	n.s.
SCI		0.56	3.2	<.01
AAQ-II		0.17	0.74	n.s.
Predicting SI-R difficulty discarding				
Final model	0.33			<.05
DASS-depression		0.04	0.16	n.s.
DASS-anxiety		0.16	0.72	n.s.
DASS-stress		0.13	0.6	n.s.
SCI		0.5	2.79	=.01
AAQ-II		−0.23	−0.96	n.s.
Predicting SI-R acquisition				
Final model	0.42			<.01
DASS-depression		−0.43	−1.9	n.s.
DASS-anxiety		0.24	1.17	n.s.
DASS-stress		0.36	1.77	n.s.
SCI		0.39	2.33	<.03
AAQ-II		0.08	0.38	n.s.
Predicting SI-R clutter				
Final model	0.28			=.1
DASS-depression		0.05	0.19	n.s.
DASS-anxiety		−0.25	−1.09	n.s.
DASS-stress		−0.46	−2.05	=.05
SCI		0.34	1.83	<.08
AAQ-II		0.34	1.38	n.s.

SI-R Saving Inventory-Revised, *SCI* Saving Cognitions Inventory, *AAQ-II* Acceptance and Action Questionnaire-II, *DASS* Depression Anxiety Stress Scales

Discussion

The present study examined the relationship between beliefs about possessions, EA, and self-reported hoarding behavior in a sample of individuals with HD, and included HC and AD comparison groups. Previous research with an undergraduate sample found that EA predicted some hoarding symptoms above and beyond the contribution of general distress and hoarding-related beliefs, suggesting that the unwillingness to experience or remain in contact with unpleasant emotions, thoughts, and sensations (and attempts to avoid or escape from these experiences) plays a unique role in hoarding symptoms. The present study attempted to replicate this finding in a clinical sample, yet we found no evidence for this relationship. Although our HD group experienced heightened levels of EA compared to healthy adults, differences in the lower-order symptoms of depression, anxiety and stress accounted for this difference. In addition, compared to individuals with other anxiety disorders, our HD group experienced less EA. Within our HD participants, EA was not associated with any of the symptoms of hoarding, and did not contribute any unique variance in our regression models predicting these symptoms. Rather, EA was only related to the symptoms of anxiety, stress, and (particularly) depression.

In contrast, beliefs about possessions, which are presumed to be a relatively hoarding-specific cognitive phenomenon, were robustly related to hoarding symptoms in our clinical sample. Within our HD group, these types of beliefs were moderately correlated with hoarding symptoms, particularly excessive acquisition of, and difficulty discarding, items; and these beliefs accounted for a

significant portion of variance in hoarding symptoms even after accounting for EA and for levels of depression, anxiety, and stress. This result supports the cognitive-behavioral model of hoarding reviewed above (Frost and Hartl 1996; Steketee and Frost 2003) which proposes that beliefs about possessions play a role in the development and maintenance of problems with excessive acquisition of, and difficulty discarding, needless items.

A noteworthy exception to this general pattern was the Clutter subscale of the SI-R. Clutter symptoms were not predicted by any of the cognitive or psychological constructs we measured, including EA, beliefs about possessions, as well as depression, anxiety and stress. Even together, this combination of measures failed to account for significant variance in predicting clutter symptoms in the hoarding group; a finding that deserves further consideration. The extent of clutter in one's home can be influenced by external factors (unrelated to underlying beliefs or styles of emotional avoidance), such as the size of the individual's home or presence of family members who may clean or de-clutter rooms. In addition, the SI-R clutter items ask about interference caused by clutter in the home, not solely the amount or extent of clutter. This is relevant as individuals with HD may adapt to clutter levels over time to function within them. These factors might to explain some of the unaccounted for variance in clutter scores. In addition, although the amount of variance accounted for did not reach statistical significance, a sizeable amount was accounted for by variables in the regression model. Thus, in a larger sample, a significant result might have been obtained.

In summary, our findings cast doubt on the role of EA as a useful construct in conceptualizing clinical manifestations of hoarding problems. Avoidance of emotional experience might be relevant in understanding general distress in HD individuals, yet specific beliefs about possessions are more strongly related to the experience of hoarding symptoms, especially problems with excessive acquisition and difficulty discarding. To the extent that hoarding is related to OCD, our findings are in concert with Manos et al. (2010), who found that among patients with OCD, obsessive–compulsive symptoms were only uniquely predicted by relatively specific cognitive distortions (i.e., obsessive beliefs) and not by EA. Together, these results highlight the importance of disorder-specific cognitions over a general tendency to avoid one's internal experiences as central components of OCD and hoarding pathology.

Our findings should be evaluated in light of several limitations of the present study. As alluded to previously, the present study employed a relatively small sample of individuals with HD ($n = 33$), which may have limited the power of our regression analyses. Although useful as an initial evaluation of the predictive power of psychological constructs in a clinical sample, future research enlisting larger groups is warranted in order to replicate these findings. In addition, our sample of individuals with HD may be different from hoarding samples previously reported on in the literature. For example, our HD group was recruited from the community and was non-treatment seeking. Our group was also mainly Caucasian or African American. Therefore, our sample may not be entirely representative of the broader population of individuals with HD, which stresses the need for future research in additional HD samples.

Additional limitations should also be noted. For example this study relied exclusively on self-report measures administered at a single time point. This raises the possibility that shared method variance inflated the relationships among some variables. In addition, the cross-sectional and correlational design we used precludes causal inferences regarding the relationship between EA and beliefs about possessions in hoarding symptoms. Indeed, hoarding symptoms might precede these other phenomena, or all might share a common cause (a "third variable"). Longitudinal research is needed in order to establish temporal precedence and gauge the extent to which hoarding-related beliefs and EA predict hoarding symptoms over time. Finally, as mentioned previously, our models left a large portion of the variance in hoarding symptoms unaccounted for. This was especially true for clutter symptoms. Other constructs, which were not measured in the present study, might better account for these symptoms. Future research is needed in order to elucidate these factors.

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