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Imperfection, Indecision, and Hoarding

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Abstract *Hoarding disorder* is a new DSM-5 disorder that causes functional impairment and affects 2 to 6% of the population (Frost and Steketee 2014). The current study evaluated a multiple mediation model with 243 undergraduate women in which indecisiveness (*VOCI*; Thordarson et al. *Behaviour Research and Therapy, 42*(11), 1289-1314, 2004) and decisional procrastination (*DPS*; Mann 1982) mediated the relationship between dimensions of perfectionism *(F-MPS-B*; Burgess et al. 2016a) and hoarding behavior (*SI-R*; Frost et al. *Behaviour Research And Therapy, 42*(10), 1163–1182, 2004) and excessive acquiring (*CAS*; Frost et al. *Annual Review of Clinical Psychology*, *8*, 219–242, 2012). Multiple mediational analyses indicated a significant indirect effect for decisional procrastination, but not indecisiveness, in mediating evaluative concerns (but not striving) to *SI-R Total, SI-R Clutter, SIR Excessive Acquisition*, and both *CAS* subscales. Both mediators were significant pathways between evaluative concerns and *SI-R Difficulty Discarding*. These findings support a cognitive behavioral model of hoarding, suggesting that evaluative concerns produces problems in decision-making that influence acquisition, discarding, and clutter.

Keywords Perfectionism · Evaluative concerns · Striving · Indecisiveness · Procrastination · Hoarding disorder

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Although *hoarding* has historically been conceptualized as part of OCD (Rasmussen and Eisen 1992), it is now considered a distinct diagnostic category in the DSM-5 (American Psychiatric Association, 2013) and is defined by difficulty parting with possessions along with resulting clutter that interferes with the ability to use rooms in the home. In addition to these features, the diagnostic criteria for hoarding disorder (HD) include the specifier "with excessive acquisition," which indicates the acquiring of free or purchased items for which there is no need and/or no available space (APA, 2013). Excessive acquisition in the form of compulsive buying or the excessive acquisition of free things characterizes most people suffering from HD (Frost et al. 2013).

Prevalence of hoarding has been estimated at between 2 and 6% of the population (Frost and Steketee 2014). Hoarding may have considerable adverse consequences for sufferers, family members, neighbors, and the general community (Tolin et al. 2008), including serious threats to health and safety. Much of the work on the etiology of hoarding was driven by the cognitive behavioral model of hoarding proposed by Frost and Hartl (1996) and Steketee and Frost (2003). This model incorporated behavioral, emotional, and cognitive processing components as well as vulnerability factors. Two features that play a prominent role in this model are perfectionism and indecisiveness.

Perfectionism is conceptualized as bi-dimensional, with the two underlying constructs being the setting of high personal standards and worry surrounding critical performance evaluation (Frost et al. 1990). Striving, or setting high expectations for one's self, is often found to be associated with adaptive outcomes such as higher life satisfaction and high academic achievement (Flett and Hewitt 2002), and is inconsistently related to maladaptive outcomes such as eating disorder pathology (Egan et al. 2011). However, the evaluative concerns component of perfectionism, which is characterized by worry

about performance evaluation, making mistakes, and experiencing failure, is consistently associated with mental health concerns, including depression, social anxiety, eating disorders, hoarding behaviors, and OCD symptom severity (Burgess et al. 2016b). A cognitive behavioral model of hoarding suggests that a high level of evaluative concerns, but not striving, leads to an avoidance or delay in making decisions about discarding because any decision might involve a mistake.

In support of this model, several studies found associations between both characteristics (perfectionism and indecisiveness) and hoarding. Regarding perfectionism, strong correlations found between dimensions of perfectionism and hoarding behavior (Kyrios et al. 2004; Martinelli et al. 2014; Timpano et al. 2011). Frost and Gross (1993) found strong correlations between all subscales of the Frost Multidimensional Perfectionism Scale, including both evaluative concerns and striving components and hoarding symptoms. Not only is perfectionism associated with hoarding pathology, but Muroff et al. (2014) found that high levels of perfectionism interfere with treatment outcome for individuals with HD. In most of these studies, it was the evaluative concern dimension of perfectionism that showed the closest association with hoarding, characterized by overly critical self-evaluation and fears of making mistakes (Frost et al. 1990).

Problems with decision-making, including both the avoidance of decision-making (i.e., *decisional procrastination*) and the inability to decide (i.e., information processing deficit of *indecisiveness*), found in hoarding samples were linked to neurological processes (Frost et al. 2011; Tolin et al. 2012). Individuals with HD report more decision-making problems than individuals with OCD and non-clinical controls (Hayward and Coles 2009; Cougle et al. 2013), and problems with decision-making predict hoarding severity along with each of the four core hoarding behaviors (Frost et al. 2011). Taken together, existing literature suggests that problems with decision-making play a unique and important role in hoarding behaviors.

In the limited extant research, evaluative concerns have been associated with indecision. Evaluative concerns may be linked to indecisiveness in that fears about failure and mistake making may create an inability to make decisions (Riddle et al. 2016). Frost and Shows (1993) found that indecisiveness was positively correlated with several indices of evaluative concerns, including concern over making mistakes, doubts about one's actions, and worries about others' critical evaluations. However, this relationship may vary by sample pathology level, as Ferrari (1995) found that perfectionistic cognitions and indecision were related to clinical but not college-aged samples.

The present study clarified the relationship of the dimensional model of perfectionism to hoarding behaviors through two potential mechanisms: indecision and decisional procrastination. Researchers often consider decisional procrastination and indecision as a uni-dimensional construct (see Ferrari 2010; Ferrari and Tibbett 2017, for an understanding of this perspective). However, in the present study these two related concepts were separated in cognitive variables. A multiple mediation model was examined in which two indices of problems with decision-making mediated the relationship between dimensions of perfectionism and hoarding behaviors. Previous literature supports the hypothesized positive correlations and direct effects between evaluative concerns and hoarding behaviors, and the hypothesized lack of associations between striving and hoarding. Further, the cognitive behavioral model of hoarding suggests that avoidance of decision-making and the information processing deficit of indecisiveness may act as mechanisms through which excessive concern over performance evaluation, but not striving, may lead to hoarding. Therefore, positive indirect effects were anticipated for the pathways of evaluative concerns to both indices of problems with decision-making to each hoarding behavior separately (see Fig. 1). On the other hand, indices of indecisiveness were not anticipated to serve as mediators for striving in predicting hoarding behavior.

Method

Participants

A total of 243 female participants were recruited from an all-women's liberal arts college in the Northeast. Specific demographic information was not available from the present sample; however, average age for the female student body of the college at the time of recruitment was 20 years. Of the students reporting their ethnicity, 63.9% were "White, non-Hispanic," 16.2% were "Asian or Pacific Islander," 10.0% were "Black, non-Hispanic," 8.7% were "Hispanic," and 0.9% were "American Indian or Alaska Native." Participants were offered a small raffle or course credit in a psychology class as incentive for participation. The institutional review board of Smith College approved all policies and procedures.

Psychometric Measures

Compulsive Acquisition Scale (CAS; Frost et al. 2002) The CAS is an18-item measure assessing the desire to acquire new possessions (e.g., "Do you feel compelled to take free copies of magazines or newspapers when they are available?") along with the consequences of excessive acquisition (e.g., "Do you feel distressed or upset because you've bought things you don't need?") rated on a Likert type scale. The instrument contains two subscales, *CAS-Buy* (12 items), which assess the

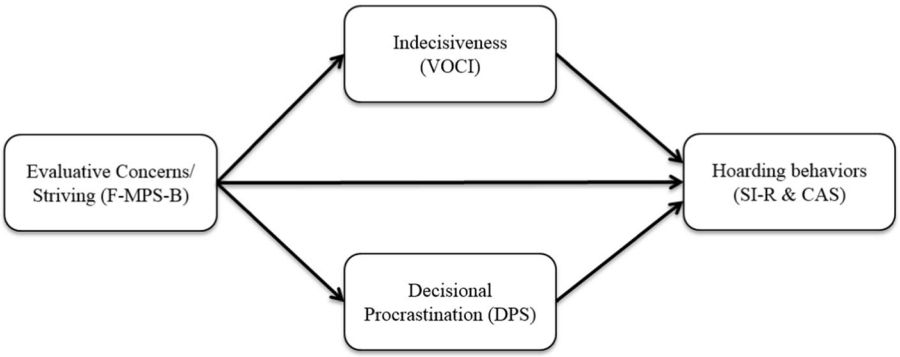

Fig. 1 Multiple mediation model in which hoarding behaviors (*SI-R* and *CAS*) are predicted by the evaluative concerns and striving dimensions of perfectionism (*F-MPS-B*) and mediated by two indicators of difficulty with decision-making (*VOCI* and *DPS*)

acquisition of purchased items, and *CAS-Free* (6 items), which measures the acquisition of free items. The *CAS* was used in the present study because the *SI-R* does not distinguish within its Acquisition subscale between buying and the collection of free objects. *CAS-Buy* and *CAS-Free* demonstrate strong internal consistency (Frost et al. 2002), and correlate with buying-related cognitions and hoarding behaviors (Frost et al. 2002; Kyrios et al. 2004). Reliability in the present sample was good for *CAS-Buy* (α = 0.93) and *CAS-Free* (α = 0.85).

Decisional Procrastination Scale (DPS; Mann 1982) The scale contains five items, rated on a 5-point Likert type scale, that measure procrastination in regards to decision-making. Example items include: "I delay making decisions until it is too late" and "I waste a lot of time on trivial matters before getting to the final decision." Higher scores indicate increased levels of difficulty making decisions due to procrastination. The scale possesses strong psychometric properties, including a Cronbach's alpha of 0.81 and one-month test–retest reliability of 0.69 (Beswick et al. 1988; Mann et al. 1997). The items have been incorporated into the Melbourne Decision-Making Questionnaire, and these items loaded together onto one factor termed "Procrastination" (Mann et al. 1997). Evidence suggests that *DPS* scores are associated with observed procrastination, specifically the time taken to submit academic assignments (Beswick et al. 1988). Within the present sample, the *DPS* evidenced good internal consistency (α = 0.88).

Frost Multi-Dimensional Perfectionism Scale-Brief (F-MPS-B; Burgess et al. 2016a, b) The original *F-MPS* (35-items) contained 6 subscales (Frost et al. 1990). A brief 8-item version of the measure, the *F-MPS-B,* including two shortened subscales assessed the bidimensional model of perfectionism: *Evaluative Concerns* (*EC*; 4 CM items; e.g., "People will probably think less of me if I make a mistake") and *Striving* (*S*; 4 PS items; e.g., "I set higher goals for myself than most people;" Burgess et al. 2016a, b). Items are rated on a 5-point Likert type scale with higher scores indicating greater perfectionism. The *EC* (α = 0.83–0.85) and *S* (α = 0.81–0.85) subscales showed strong internal consistency in clinical and community samples. *FMPS-B EC* and *S* subscales correlated with the expected strength and direction with measures of perfectionism, depression, worry, obsessive-compulsive symptoms, hoarding behaviors and beliefs in both clinical and community samples (Burgess et al. 2016a, b). Internal consistency for the *EC* (α = 0.85) and *S* (α = 0.89) subscales were strong in the current study.

Savings Inventory-Revised (SI-R; Frost, Steketee, & Grisham, 2004) The *SI-R* is a three-subscale, 23-item instrument designed to assess symptoms of HD including Clutter, Acquisition, and Discarding. Items are rated on a 7-point Likert-type scale with higher scores suggesting higher levels of hoarding behavior. The three-factor structure, along with the internal consistency and test-retest reliability of the subscales, was supported in a clinical sample of individuals struggling with hoarding behaviors (Frost et al. 2004). Convergent and discriminate validity of the SI-R have been well-established (Frost and Hristova 2011). In the current sample, the *SI-R* total score (α = 0.93) and *Acquisition* (α = 0.84), *Clutter* (α = 0.90), and *Difficulty Discarding* (α = 0.89) subscales demonstrated good internal reliability.

Vancouver Obsessive Compulsive Inventory (VOCI; Thordarson et al. 2004) The *VOCI* is a 55-item instrument assessing cognitions and behaviors of known theoretical importance to obsessive-compulsive disorder (OCD). The *Indecisiveness* subscale used in the current study is a six item subscale rated on a 5-point Likert-type scale with higher scores indicating greater indecisiveness. The Indecisiveness subscale has demonstrated high internal consistency among clinical and community samples (α = 0.90–0.79), and individuals with OCD score significantly higher on this subscale than community samples and non-OCD clinical samples. Internal consistency was good (α = 0.84) for the *VOCI Indecisiveness* subscale in the current sample.

Analytic Approach

Mediational analyses were conducted using the PROCESS macro for SPSS (Hayes 2013). A multiple mediation model was constructed in which two indices of problems with decision-making, decisional procrastination (*DPS*) and indecisiveness (*VOCI*), mediated the relationship between the striving (*F-MPS-B S*) and evaluative concerns dimension of perfectionism (*F-MPS-B EC*) and hoarding behaviors (*SI-R* and *CAS* subscales; see Fig. 1).

Results

Descriptive statistics were calculated for all study variables (see Table 1). Bivariate correlation coefficients were calculated between all study variables (see Table 2). All study variables were significantly and positively related to one another, with the anticipated exception of *Striving*. Consistent with prior literature, *Striving* was moderately and significantly related to *EC* (r = .428, p < .001). *Striving* was not correlated with any *SI-R* subscale and only weakly related to the *VOCI and* the two *CAS* subscales. The *EC* dimension of perfectionism demonstrated correlations that were weak to moderate in strength with all study variables except *Indecisiveness* (*VOCI*), with which *EC* maintained a strong correlation. As expected, the two indices of decision-making problems were strongly correlated with one another (r = .688, p < .001). The *VOCI* and *DPS* both demonstrated moderately strong relationships (p < .001) with all other study variables. Consistent with expectations, indices of hoarding behaviors (*SI-R* and *CAS* subscales) were strongly correlated with one another (p < .001). Within the context of the proposed model, The *F-MPS-B EC* subscale was significantly related to the two mediators (*VOCI* and *DPS*) and each of the hoarding behavior outcomes variables (*SI-R* and *CAS* scores). In contrast, the *F-MPS-B S* subscale was weakly related to one mediator variable (*VOCI*) and two of the six indices of hoarding behavior (*CAS Buy and Free*). Both mediators were related to all hoarding behavior outcome variables.

Multiple mediation models were investigated in which *EC* and *S* individually predicted the six different measures of hoarding related behaviors through the two mediators of indecisiveness and decisional procrastination (see Fig. 1). Beginning with *EC* as the predictor variable, *VOCI* and *DPS* as the mediators, and *SI-R* and *CAS* subscales as the outcome variables, Tables 3 and 4 presents the regression results and indirect effects for the six models evaluated. In all cases, the *F-MPS-B EC, VOCI,* and *DPS* together predicted a significant amount of variance in hoarding behavior (p < .001). For the four models predicting the *SI-R Total* score and *Difficulty Discarding, Clutter*, and *Acquisition* subscales, the direct effect of *EC* on hoarding behavior was non-significant, suggesting that *EC* does not significantly predict hoarding behavior independent of the indirect effects through *VOCI* and *DPS*. This result is particularly interesting given the significant association of the *F-MPS-B EC* and each index of hoarding behavior. Regression analyses indicated that the *DPS* was consistently a significant independent predictor of hoarding behavior, and the *VOCI* was a significant independent predictor of *Difficulty Discarding*. Next, bootstrapped indirect effects were calculated to indicate the relationship of *EC* to hoarding behaviors through each potential mediator independently. For the *SI-R Total* score*, Clutter*, and *Acquisition,* there were significant indirect effects of *EC* on hoarding behavior through *DPS* only. In the case of *Difficulty Discarding*, both the *VOCI* and *DPS* were significant mediators of the relationship between *EC* and hoarding behavior.

Two multiple mediation models were evaluated using *EC* as the predictor and the *CAS Buy* and *Free* subscales as the indices of hoarding behavior. Compared to the four *SI-R* models, the pattern of findings was similar for the *CAS* subscales in that only the indirect effect of *DPS* was statistically significant. Despite demonstrating significant, moderately strong correlations with all indices of hoarding behavior, the *VOCI* was not a mediator of the relationship between *EC* and the two *CAS* subscales. Contrasting with the *SI-R Total* score and subscales, *EC* demonstrated a significant direct effect on the *CAS* subscales independent of the two mediators, possibly suggesting that there is a unique relationship between evaluative concerns and acquisition behavior that is not explained by difficulty with decision-making.

Table 1 Descriptive statistics for study variables

	Mean	*SD*	Range
F-MPS-B evaluative concerns	8.63	4.18	4–20
F-MPS-B striving	12.87	4.80	4–20
VOCI indecisiveness	12.04	4.15	6–25
DPS decisional procrastination	11.85	4.87	5–25
SI-R total	26.41	14.32	0–80
SI-R difficulty discarding	10.09	5.77	0–28
SI-R clutter	8.50	6.19	0–29
SI-R acquisition	7.81	4.72	0–24
CAS buy	25.47	11.58	12–80
CAS free	12.71	6.56	6–40

F-MPS-B Frost Multidimensional Perfectionism Scale Brief, *VOCI* Vancouver Obsessive Compulsive Inventory, *DPS* Decisional Procrastination Scale*, SI-R* Saving Inventory-Revised, *CAS* Compulsive Acquisition Scale

Table 2 Bivariate correlations of indices of perfectionism, difficulty with decisions, and hoarding symptoms

	1	2	3	4	5	6	7	8	9
1. F-MPS-B evaluative concerns	–								
2. F-MPS-B striving	.428**	–							
3. VOCI indecisiveness	.521**	.213**	–						
4. DPS decisional procrastination	.384**	.103	.688**	–					
5. SI-R total	.253**	−.002	.387**	.463**	–				
6. SI-R difficulty discarding	.139*	−.005	.344**	.382**	.871**	–			
7. SI-R clutter	.253**	−.017	.338**	.403**	.874**	.621**	–		
8. SI-R acquisition	.265**	.024	.310**	.409**	.824**	.605**	.580**	–	
9. CAS buy	.353**	.153*	.327**	.400**	.625**	.414**	.489**	.749**	–
10. CAS free	.266**	.145*	.257**	.365**	.612**	.496**	.503**	.592**	.645**

F-MPS-B Frost Multidimensional Perfectionism Scale Brief, *VOCI* Vancouver Obsessive Compulsive Inventory, *DPS* Decisional Procrastination Scale, *SI-R* Saving Inventory-Revised, *CAS* Compulsive Acquisition Scale

* $p < .05$, ** $p < .001$

Lastly, the relationship of *Striving* to hoarding behaviors through the *VOCI* and *DPS* was evaluated. Six mediational models were investigated in which the *F-MPS-B S* subscale functioned as the predictor, the *VOCI* and *DPS* as mediators, and the *SI-R* and *CAS* subscales as outcome variables. As expected, *Striving* demonstrated inconsistent relationships with indices of hoarding behavior; however, per the recommendation of Hayes (2013), a significant relationship between the predictor and outcome variable was not considered a prerequisite for evaluating indirect mediational effects (e.g., due to the possibility of suppressor variables reducing the strength of total effects). Multiple mediation analyses indicated that, when taking into account the role of decision-making problems, *Striving* remained non-significantly related to hoarding behavior. Regression analyses suggested that *DPS* was the only significant independent predictor of hoarding behavior in five of these six models. When predicting *Difficulty Discarding* only, the *VOCI* was also a significant independent predictor of the hoarding symptom. Unlike *EC, Striving* evidenced a nonsignificant direct effect for the two *CAS* subscales as well. Further, when evaluating indirect effects, there was little evidence that decision-making is a process through which *Striving* might be related to hoarding behavior. The one exception was the model predicting the *SI-R Difficulty Discarding* subscale, for which there was a significant indirect effect of *Striving* through the *VOCI* to predict *Difficulty Discarding*. Interestingly, this result echoes that of *EC*, for which only the *VOCI* acted as a significant pathway for *Difficulty Discarding*.

Discussion

Consistent with previous literature, both evaluative concerns and decision-making problems were correlated with each feature of hoarding (excessive acquisition, difficulty discarding, clutter), as well as both compulsive buying and the excessive acquisition of free things. Examination of the mediation analyses indicated that the relationship between evaluative concerns and each of the hoarding measures was mediated by decision-making difficulty. Frost and Hartl (1996) argued that excessive concern over mistakes (i.e., evaluative concerns dimension of perfectionism) leads to avoidance of making decisions about discarding, especially when there is the possibility that the decision may someday be regretted. The observed indirect effects for decisional procrastination on each of the measures of hoarding and excessive acquiring support this hypothesis; the role of evaluative concerns in hoarding appears to be operating through its influence on decision-making.

With regard to difficulty discarding, both measures of indecisiveness showed indirect effects. For the other dimensions of hoarding (excessive acquisition, clutter, total score), only the *DPS* showed a significant indirect effect. Differences between the two measures of decision-making difficulty may be responsible for this pattern of results. The *VOCI* addresses anxiety, regret, and difficulty deciding while the *DPS* assesses avoidance and delay in making decisions. The findings suggest that both delay in decision-making and anxiety surrounding decision-making are important to understanding the relationship between evaluative concerns and difficulty discarding specifically. Evaluative concerns might lead to excessive acquisition and clutter primarily through behaviors that delay decisions about possessions rather than through indecision based on information processing deficits. This might explain anecdotal accounts from people with hoarding disorder of episodes in which they avoid making a decision about which color shirt to buy by purchasing the same shirt in 5 colors.

Table 3 Multiple mediation models predicting hoarding symptoms with evaluative concerns through indecisiveness and decisional procrastination

Prediction model	Regression model *b (se)*	R^2	Indirect effect (*SE*)	BC 95% CI for indirect effect
SI-R total		.226**		
F-MPS-B EC	.196 (.229)			
VOCI	.354 (.293)		.183 (.170)	−.126 to .553
DPS	1.089** (.231)		.487* (.127)	.269 to .772
SI-R difficulty discarding		.161**		
F-MPS-B EC	−.090 (.096)			
VOCI	.259* (.123)		.134* (.068)	.006 to .270
DPS	.330** (.097)		.148* (.052)	.054 to .259
SI-R clutter		.176**		
F-MPS-B EC	.141 (.102)			
VOCI	.102 (.131)		.053 (.078)	−.079 to .227
DPS	.406** (103)		.182* (.058)	.091 to .320
SI-R acquisition		.181**		
F-MPS-B EC	.145 (.078)			
VOCI	−.008 (.100)		−.004 (.058)	−.110 to .113
DPS	.353** (.078)		.158* (.043)	.088 to .255
CAS buy		.207**		
F-MPS-B EC	.664** (.187)			
VOCI	−.051 (.240)		−.027 (.140)	−.304 to .249
DPS	.763** (.189)		.341* (.110)	.171 to .630
CAS free		.154**		
F-MPS-B EC	.265* (.109)		.	
VOCI	−.112 (.140)		−.058 (.074)	−.205 to .089
DPS	.470** (.111)		.210* (.059)	.114 to .355

BC 95% CI = bootstrapped bias-corrected confidence intervals with 1000 samples; *SI-R* Saving Inventory-Revised, *F-MPS-B EC* Frost Multidimensional Perfectionism Scale Brief Evaluative Concerns, *VOCI* Vancouver Obsessive Compulsive Inventory, *DPS* Decisional Procrastination Scale, *CAS* Compulsive Acquisition Scale

*$p < .05$ or CI does not contain zero; ** $p < .01$

When problems with decision-making were taken into account, there was no association between perfectionism and any *SI-R* subscale (i.e., no direct effects). However, the findings were somewhat different for excessive acquisition as measured by the *CAS*. For buying and the acquisition of free things, both an indirect effect for decisional procrastination and a direct effect for perfectionism were indicated. At least a portion of the relationship between perfectionism and excessive acquisition is not accounted for by decision-making problems. Decisions to acquire possessions may pose different problems for people with HD. The decision not to discard requires no behavioral response and can occur without any attempt at making a decision. Acquiring, however, requires a behavior. Instead of inertia (not discarding), the default for people with HD is to make an active decision to acquire. Evaluative concerns may play more of a role here in leading people to avoid "missing out" by not acquiring. The decisional problems often reported by people with HD are difficulties deciding how many to buy (e.g., multiple shirts in different colors since deciding on one is too difficult), not whether to buy. It should be noted, however, that the absence of a direct effect for evaluative concerns on the SI-R excessive acquisition scale is inconsistent with this conclusion.

These findings may have important implications for the treatment of hoarding symptoms. If decision-making difficulties are driven in part by evaluative concerns, perhaps treating this set of cognitions before or in tandem with hoarding-related behaviors might increase the effectiveness of therapy. Because perfectionism appears to lead to clutter and excessive acquisition through behaviors that delay decisions about possessions rather than by creating true indecision, the relationship may be avoidance-based rather than reflect issues with information processing. That is, it may not be difficulty in making decisions but avoidance of decision-making that produces excessive acquiring and clutter. Reducing

Table 4 Multiple mediation models predicting hoarding symptoms with striving through indecisiveness and decisional procrastination

Prediction model	Regression model *b (se)*	R^2	Indirect effect (*SE)*	BC 95% CI for indirect effect
SI-R total		.228**		
F-MPS-B S	−.213 (.174)			
VOCI	.516 (.276)		.095 (.065)	−.003 to .265
DPS	1.080** (.231)		.113 (.077)	−.016 to .289
SI-R difficulty discarding		.163**		
F-MPS-B S	−.084 (.073)			
VOCI	.241* (.116)		.044* (.026)	.004 to .108
DPS	.320** (.097)		.033 (.025)	−.001 to .105
SI-R clutter		.176**		
F-MPS-B S	−.101 (.078)			
VOCI	.203 (.123)		.038 (.029)	−.005 to .112
DPS	.404** (.103)		.042 (.030)	−.004 to .117
SI-R acquisition		.169**		
F-MPS-B S	−.027 (.060)			
VOCI	.072 (.094)		.013 (.020)	−.023 to .056
DPS	.357** (.079)		.037 (.026)	−.005 to .104
CAS buy		.175**		
F-MPS-B S	.248 (.145)			
VOCI	.197 (.231)		.036 (.055)	−.062 to .164
DPS	.811** (.193)		.085 (.061)	−.017 to .227
CAS free		.145**		
F-MPS-B S	.153 (.084)			
VOCI	−.030 (.133)		−.006 (.026)	−.055 to .051
DPS	.494** (.111)		.052 (.035)	−.010 to .125

BC 95% CI = bootstrapped bias-corrected confidence intervals with 1000 samples; *SI-R* Saving Inventory-Revised, *F-MPS-B S* Frost Multidimensional Perfectionism Scale Brief Striving, *VOCI* Vancouver Obsessive Compulsive Inventory, *DPS* Decisional Procrastination Scale, *CAS* Compulsive Acquisition Scale

*$p < .05$ or CI does not contain zero; ** $p < .01$

evaluative concerns may reduce these avoidance behaviors that contribute to the disorder. Recent evidence strengthens these conclusions suggesting that perfectionism in people with HD may interfere with treatment outcome (Muroff et al. 2014).

With respect to the second component of the bi-dimensional model of perfectionism, achievement striving, the analyses indicated that, consistent with prior literature (Frost et al. 1990), striving for high goals and concerns about performance evaluation are not similarly related to psychopathology. *Striving* was only weakly related to two out of six indices of hoarding behavior. Mediational analyses suggested that striving was only related to difficulty discarding objects through indecisiveness; no other model contained significant pathways between *Striving* through either index of decision-making to any indicator of hoarding behavior. These results confirm the current understanding in the literature of the differential nature and role of the two components of perfectionism: evaluative concerns and achievement striving.

Though promising, the findings for this study were based on a non-clinical and college aged sample of females. Previous literature has found weaker associations between perfectionism and hoarding in non-clinical and college age samples than in community or clinical HD samples (Frost and Gross 1993). Similarly, in the present study, correlations between perfectionism and both difficulty discarding and clutter were weaker than correlations in community or clinical samples (Frost and Gross 1993). Replication of these findings in clinical HD and community samples as well as samples including males is needed. Further, an important limitation in the current study was that measures of decision-making problems were self-report. Findings from self-report measures of this construct have consistently shown strong associations with hoarding, but the relationship between hoarding symptoms and neuropsychological and more objective measures of decision-making problems have been weak or nonexistent. The meaning of this discrepancy is unclear (Moshier et al. 2016).

In summary, the present study investigated the role of decision-making difficulty in the relationship between perfectionism and hoarding behaviors. The two components of the bidimensional model of perfectionism were investigated, and as expected, evaluative concerns but not striving was related to other key study variables. Mediational analyses suggested that decisional procrastination is a process through which evaluative concerns may impact a variety of hoarding behaviors. When considering the relationship of evaluative concerns and difficulty discarding possessions specifically, both avoidance of decision-making and anxiety or regret around decision-making may be important mechanisms. These results suggest that using cognitive and behavioral strategies to target evaluative concerns and avoidance of decision-making may be useful in the treatment of the newly defined and prevalent diagnostic category.

Compliance with Ethical Standards All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

Conflict of Interest All authors declare that they have no conflicts of interest.

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