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An Experimental Investigation of the Effect of Stress on Saving and Acquiring Behavioral Tendencies: The Role of Distress Tolerance and Negative Urgency

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Stress has been implicated as a risk factor for hoarding, although past research has relied on cross-sectional and self-report designs. Using experimental methods and objective hypothetical behavioral hoarding paradigms, we investigated the direct effect of stress on in-the-moment saving and acquiring behavioral tendencies. We also evaluated whether distress tolerance (DT) and negative urgency interacted with stress to predict saving and acquiring behavioral tendencies. A sample of young adults (N = 80) completed questionnaires about DT and negative urgency. Participants were randomized to either a psychosocial stressor or nonstressful control task prior to completing two hypothetical behavioral hoarding paradigms. The discarding task asked participants to choose between saving and disposing of items. For the acquiring task, participants completed a computer-simulated shopping spree that measured items acquired. Unexpectedly, participants in the stress condition saved and acquired *fewer* items than those in the control condition. As hypothesized, stress interacted with DT to predict saving tendencies. The current study should be replicated in a clinical sample. Longitudinal studies are needed to further examine the long-term effect of stress on hoarding. This is the first examination of the direct effect of stress on saving and acquiring tendencies. Although some study hypotheses were not supported, several results are consistent with our predictions and suggest a complex relationship between stress and hoarding. If findings are replicated in a clinical sample, it may be that hoarding patients could benefit from treatments incorporating DT strategies.

Keywords: hoarding; stress; distress tolerance; stress manipulation

SAVING AND COLLECTING TENDENCIES are usually considered relatively normative behaviors among the general population (Frost & Steketee, 2008), and have been found to vary across individuals on a dimension of severity (Timpano, Broman-Fulks, et al., 2013). A deeper understanding of this continuum has revealed that clinically significant saving and acquiring behaviors can be so extreme that they lead to substantial clutter, as well as considerable distress and impairment for the individual. These symptoms jointly represent a tremendous public health burden, potentially jeopardizing the health and safety of the community and resulting in substantial costs to municipalities (Frost, Steketee, & Williams, 2000; McGuire, Kaercher, Park, & Storch, 2013; Tolin, Frost, Steketee, Gray, & Fitch, 2008). Hoarding disorder (HD) reflects the most severe manifestations of saving and acquiring behaviors and affects between 3 and 5% of the population (Timpano, Exner, et al., 2011). It is characterized by extreme difficulties with discarding and severely cluttered homes, and can also include excessive acquiring (American Psychiatric Association, 2013), most often via compulsive buying or collecting free items (Frost, Tolin, Steketee, Fitch, & Selbo-Bruns, 2009; Timpano, Exner, et al., 2011). HD is considered extremely challenging to treat (Abramowitz, Franklin, Schwartz, & Furr, 2003;

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Tolin, Frost, Steketee, & Muroff, 2015), and as a result, there is a pressing need to better understand potential etiological and maintenance factors to inform intervention efforts.

The cognitive-behavioral model of hoarding outlines several different components, including erroneous beliefs about possessions, information processing deficits, and emotional avoidance patterns, that are thought to interact to invoke hoarding symptoms (Frost & Hartl, 1996; Tolin, 2011). A central tenet of the cognitive-behavioral model of hoarding is that strong emotions play an important role in triggering avoidant (i.e., saving) and approach (i.e., acquiring) hoarding behaviors (Frost & Hartl, 1996; Steketee & Frost, 2003). For example, marked distress and intense negative affect can occur when a person with hoarding has to discard a cherished possession or cannot acquire a desired item (Frost & Hartl, 1996). Subsequent emotional and behavioral avoidance patterns then serve to maintain chronic saving and excessive acquisition (Frost & Hartl, 1996). Given the prominent theoretical role of emotional processes in hoarding, researchers have begun to examine factors that could explain the link between emotional responding and hoarding symptoms. Specifically, life stress and cognitive factors implicated in emotional responding have both emerged as independent risk factors for hoarding (de la Cruz et al., 2013; Hartl, Duffany, Allen, Steketee, & Frost, 2005; Timpano, Keough, Traeger & Schmidt, 2011).

The literature thus far on the relationship between stress and hoarding has focused on the association between stressful and traumatic life events (SLEs/TLEs) and hoarding severity, and the role stress may play in hoarding's onset. Findings have indicated that patients with hoarding report more TLEs than patients with obsessive–compulsive disorder and controls (Hartl et al., 2005; Landau et al., 2011), and greater hoarding severity is associated with more frequent SLEs/TLEs in both clinical and nonclinical samples (Cromer, Schmidt, & Murphy, 2007; Landau et al., 2011; Timpano, Keough, et al., 2011; Tolin, Meunier, Frost, & Steketee, 2010; Torres et al., 2012). SLEs/TLEs also appear to be important in the onset of hoarding (Grisham, Frost, Steketee, Kim, & Hood, 2006; Landau et al., 2011; Przeworski, Cain, & Dunbeck, 2014; Timpano, Keough, et al., 2011; Tolin et al., 2010). In sum, the extant literature has found that experiencing more SLEs/TLEs has been consistently associated with greater hoarding symptoms, and that SLEs/TLEs may play an important role in the development of hoarding.

Given that patients with hoarding have been found to experience SLEs/TLEs more frequently, it is also important to consider factors that may exacerbate the subjective experience of a distressing event, as this may impact a person's downstream efforts to regulate negative emotions elicited by SLEs. Research has begun to elucidate how specific cognitive risk factors relevant to emotional responding relate to hoarding. A range of emotional constructs (e.g., anxiety sensitivity, experiential avoidance) have been examined, and results generally indicate that lower tolerance of negative emotions is associated with greater hoarding. In particular, self-reported hoarding symptoms have been linked with lower distress tolerance (DT; Shaw, Timpano, Steketee, Tolin & Frost, 2015; Timpano, Buckner, Richey, Murphy, & Schmidt, 2009; Timpano, Shaw, Cougle, & Fitch, 2014), which reflects one's perceived capacity to withstand negative affective states (Leyro, Zvolensky, & Bernstein, 2010), as well as greater negative urgency (Timpano, Rasmussen, et al., 2013), defined as the tendency to act impulsively in response to negative affect (Lynam & Miller, 2004). Of note, one study found that lower emotional tolerance, which reflects lower levels of DT, mediated the relationship between SLEs and self-reported hoarding symptoms (Timpano, Keough, et al., 2011). This finding underscores the possibility that these cognitive factors influence the impact of a stressor on hoarding symptoms. Although DT may influence one's subjective experience during a SLE, negative urgency can impact one's subsequent behavioral responses to an SLE.

Several key limitations of past research prevent us from fully understanding the impact of stress, DT, and negative urgency on hoarding. First, all studies have relied on cross-sectional or retrospective designs to capture the construct of stress. Second, previous research has most frequently relied on self-report indices of hoarding. Past studies have therefore not allowed us to directly examine the temporal, momentary relationship between stress and hoarding behaviors. Given that stress reactions can be successfully manipulated in the laboratory (Dickerson & Kemeny, 2004), it is noteworthy that no studies have examined whether an acute stressor can directly increase subsequent in-the-moment saving or acquiring tendencies. Examining how acute stress, rather than one's history of TLEs or SLEs, impacts saving and acquiring tendencies may inform the cognitive-behavioral model of hoarding and interventions for hoarding, by elucidating whether stress serves as a trigger for avoiding discarding and compulsively acquiring. Finally, research to date has not been able to adequately address any hypothesized factors that might interact with stress to predict hoarding behaviors. For example, DT and/or negative urgency may interact with stress to predict hoarding behaviors, given that DT and negative urgency have been