EFFECT OF ACCEPTANCE VERSUS PSYCHOEDUCATION ON HOARDING

by

Clarissa W. Ong

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Approved:

Michael P. Twohig, Ph.D. Major Professor	Rick A. Cruz, Ph.D. Committee Member
Michael E. Levin, Ph.D. Committee Member	Laurens H. Smith, Ph.D. Interim Vice President for Research and Interim Dean of the School of Graduate Studies

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ABSTRACT

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by

Clarissa W. Ong, Master of Science

Utah State University, 2018

Major Professor: Michael P. Twohig, Ph.D.
Department: Psychology

Hoarding disorder (HD) is characterized by difficulty letting go of possessions, resulting in clutter that precludes use of active living spaces. Consequences associated with hoarding include strained family relationships, distress for children in the home, and increased burden on social services. Currently, the most empirically supported treatment for HD is cognitive-behavioral therapy (CBT), which includes such components as psychoeducation, motivational interviewing, cognitive restructuring, and exposure. Despite its demonstrated effectiveness, CBT does not result in clinically significant improvement for at least 50% of individuals, indicating the need for alternative interventions for nonresponders. Acceptance and commitment therapy (ACT), an acceptance- and mindfulness-based therapy, is one potential alternative. The overarching aim of ACT is to improve psychological flexibility, the ability to act consistently with valued life directions in the presence of difficult internal experiences. Given the high levels of avoidance consistently observed in hoarding, expanding one's behavioral

repertoire in response to distressing stimuli may be a particularly useful skill. Furthermore, ACT has been found to be effective for multiple conditions related to HD, including anxiety disorders and obsessive-compulsive disorder. The current analog study compared the effects of acceptance-based training to psychoeducation on several indices of hoarding severity in a sample of college students with elevated hoarding. Participants ($N = 47$) completed an in vivo discarding behavioral task and self-report measures at postintervention as well as an online follow-up survey one week later. There were no differences in outcomes between conditions over time, suggesting that acceptance training was not more effective than psychoeducation alone. Significant and large effect sizes for hoarding severity and hoarding cognitions were found from baseline to one-week follow-up, indicating that both interventions improved hoarding symptoms in our sample. These findings tentatively support the utility of investigating methods of early intervention for hoarding as well as efficacy of treatment components in isolation to identify necessary and sufficient modules that would permit more parsimonious therapeutic designs. Limitations of the study include lack of a true control group to estimate placebo effects; lack of measures of potential mechanisms of change; and use of a nonclinical, demographically homogeneous sample.

(73 pages)

PUBLIC ABSTRACT

Effect of Acceptance Versus Psychoeducation on Hoarding

Clarissa W. Ong

Hoarding disorder (HD) is a mental health condition characterized by difficulty letting go of possessions, resulting in clutter that prevents use of active living spaces. Consequences associated with hoarding include strained family relationships, distress for children in the home, and increased burden on social services. Currently, the most empirically supported treatment for HD is cognitive-behavioral therapy (CBT), which includes such components as education about the nature of hoarding, challenging unhelpful thoughts, and exposure to distressing stimuli. Despite its demonstrated effectiveness, CBT does not result in clinically significant improvement for at least 50% of individuals, indicating the need for alternative interventions for those who do not respond to CBT. Acceptance and commitment therapy (ACT), an acceptance- and mindfulness-based therapy, is one potential alternative. The overarching aim of ACT is to improve psychological flexibility, the ability to act consistently with meaningful life directions in the presence of difficult internal experiences. Given the high levels of avoidance (e.g., of decision making, of distress) consistently observed in hoarding, increasing one's range of responses to previously avoided stimuli in the service of more fulfilling activities may be a particularly useful skill. Furthermore, ACT has been found to be effective for clinical presentations related to HD, including anxiety disorders and obsessive-compulsive disorder. The current exploratory study compared the effects of

acceptance-based training to psychoeducation on several measures of hoarding severity in a sample of college students with elevated hoarding. Participants ($N = 47$) completed a discarding behavioral task and self-report measures at postintervention as well as an online follow-up survey one week later. There were no differences in outcomes between conditions over time, suggesting that acceptance training was not more effective than psychoeducation alone. Hoarding severity and thoughts related to hoarding significantly decreased from baseline to one-week follow-up, indicating that both interventions improved hoarding symptoms in our sample. These findings also suggest that early intervention may be a useful approach to alleviating hoarding symptoms.

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CHAPTER I

INTRODUCTION

Hoarding disorder (HD) is characterized by persistent difficulty letting go of possessions, resulting in clutter that precludes use of active living spaces (American Psychiatric Association [APA], 2013). Functional impairment due to hoarding is relatively common, affecting the individual, family, neighbors, and the wider community (Tolin, Frost, Steketee, & Fitch, 2008; Tolin, Frost, Steketee, Gray, & Fitch, 2008). Currently, the most empirically supported intervention for HD is cognitive-behavioral therapy (CBT), which incorporates psychoeducation, motivational interviewing, cognitive restructuring, and exposure (Muroff, Bratiotis, & Steketee, 2011; Muroff et al., 2009; Steketee, Frost, Tolin, Rasmussen, & Brown, 2010; Tolin, Frost, & Steketee, 2007). While effective for many individuals with HD, at least 50% of participants in clinical trials for HD did not experience clinically significant improvement in symptoms (Tolin, Frost, Steketee, & Muroff, 2015), indicating a need for alternative interventions to address problematic hoarding.

One possible avenue is acceptance and commitment therapy (ACT), an acceptance- and mindfulness-based intervention that has been found to be effective in the treatment of a range of conditions, including those related to HD, such as obsessive-compulsive disorder and anxiety disorders (A-Tjak et al., 2015; Arch et al., 2012; Twohig et al., 2010). The overarching objective of ACT is to create extensive, flexible behavioral repertoires in response to stimuli that typically elicit a narrow range of reactions (e.g., avoidance)—a skill termed psychological flexibility (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). A key feature in the presentation of hoarding is a chronic pattern of

behavioral and experiential avoidance that supersedes engagement in meaningful life domains (Ayers, Castriotta, Dozier, Espejo, & Porter, 2014; Frost & Hartl, 1996). For example, accumulating items to avoid the distress associated with discarding may come at the cost of fostering interpersonal relationships or maintaining a healthy home environment. Hence, using acceptance-based therapeutic methods that directly target avoidance of unwanted internal experiences and explicitly promote action in valued directions may be a viable means of improving the wellbeing of individuals who struggle with problematic hoarding.

To date, no research has investigated the use of such techniques in the context of HD, reflecting a chasm in the treatment literature. Given the severity of consequences associated with clinical hoarding and the limited—albeit promising—effectiveness of current cognitive-behavioral interventions, there is a need to empirically examine the utility of alternative approaches to the treatment of HD. The current study used an experimental design and analog nonclinical sample (i.e., college students with elevated hoarding) to test the efficacy of acceptance-based training relative to psychoeducation on hoarding symptoms. It represents an exploratory foray into a broader program of research evaluating the effectiveness of acceptance- and mindfulness-based interventions for significant hoarding. Participants completed an in vivo discarding task as well as self-report measures at the end of the experiment as well as an online follow-up survey one week later to assess durability of treatment effects. We hypothesized that acceptance training would increase discarding and psychological flexibility and decrease hoarding severity and hoarding cognitions compared to psychoeducation.

CHAPTER II

LITERATURE REVIEW

HD is characterized by persistent difficulty letting go of possessions, resulting in clutter that precludes the use of active living spaces (APA, 2013). To be diagnosed with HD, symptoms must cause distress and/or functional impairment (APA, 2013). Functional impairment due to hoarding is relatively common; it can affect not only the individual, but also family members, neighbors, and the wider community—by straining familial ties, causing distress to offspring, and increasing social service utilization (Tolin, Frost, Steketee, & Fitch, 2008; Tolin, Frost, Steketee, Gray, et al., 2008). The point prevalence of HD ranges from 2 to 6% (Iervolino et al., 2009; Ivanov et al., 2013; Mueller, Mitchell, Crosby, Glaesmer, & de Zwaan, 2009; Timpano et al., 2011), which means that, even by conservative estimates, more than 6.5 million individuals in the U.S. could be currently be diagnosed with HD.

Cognitive-Behavioral Model of Hoarding

The cognitive-behavioral model of hoarding, first articulated by Frost and Hartl (1996), provides a theoretical framework for the phenomenology, etiology, and maintenance of hoarding. According to the model, information processing deficits (inattention, indecisiveness, disorganization, and memory problems); intense emotional attachment to and maladaptive beliefs regarding possessions; as well as experiential and behavioral avoidance (e.g., avoidance of distress associated with discarding, avoidance of decision making) are core elements in the pathology of hoarding (Frost & Hartl, 1996;

Steketee & Frost, 2003). Subsequent studies have empirically validated aspects of the model (Ayers et al., 2014; Shaw, Timpano, Steketee, Tolin, & Frost, 2015; Steketee, Frost, & Kyrios, 2003; Wincze, Steketee, & Frost, 2007), and this conceptualization is used to guide current treatment approaches to HD (Steketee & Frost, 2003; Steketee et al., 2010).

Information processing deficits describe cognitive difficulties centered on attention, decision making, categorization, and memory. Poor attentional focus has been observed during completion of therapeutic tasks (Steketee, Frost, Wincze, Greene, & Douglass, 2000), and inattention has been linked to hoarding severity (Grisham, Brown, Savage, Steketee, & Barlow, 2007; Hartl, Duffany, Allen, Steketee, & Frost, 2005; Tolin & Villavicencio, 2011). Individuals diagnosed with compulsive hoarding also demonstrate decision making and organization difficulties (under-inclusive categorization) specific to personal belongings (Tolin, Kiehl, Worhunsky, Book, & Maltby, 2009; Wincze et al., 2007). Actual and perceived memory deficits also affect those who hoard, though lack of confidence in memory and catastrophizing negative consequences associated with forgetting may be stronger predictors of hoarding (Hartl et al., 2004). Together, these features result in a heightened tendency to save (i.e., not make a decision), to create separate categories for individual items resulting in disorganized clutter, and to rely on objects for memory cues.

Intense emotional attachment to objects contributes to the maintenance of hoarding by establishing aversive and appetitive meanings for discarding and saving/acquiring, respectively. For example, attachment to possessions can be associated

with distress in response to even the idea of discarding and with positive emotions in response to accumulating more possessions. Maladaptive cognitions, such as the overestimation of negative consequences associated with loss of possessions, underestimation of ability to cope with distress, and self-identification with possessions (Steketee et al., 2003), can also exacerbate hoarding.

Avoidance is another component of the cognitive-behavioral model of hoarding; it encompasses both avoidance of emotional distress as well as avoidance of decision making (Frost & Hartl, 1996). Such avoidance is typically achieved through saving and acquiring and is negatively reinforced by removal of distress associated with decision making. Hoarding has been linked to intolerance of uncertainty, overestimation of threat from negative emotions, and perceived inability to cope with distress (Oglesby et al., 2013; Timpano, Buckner, Richey, Murphy, & Schmidt, 2009), which make avoiding aversive emotional states particularly enticing. Furthermore, the process of decision making may be cognitively taxing for individuals with hoarding (Tolin et al., 2009), suggesting that the act of decision making per se is experienced as aversive.

Treatment for Hoarding Disorder

Treatment models for HD are based on the cognitive-behavioral model outlined above, and contain elements, such as psychoeducation, motivational interviewing, cognitive restructuring, and exposure (Muroff et al., 2011, 2009; Steketee et al., 2010; Tolin et al., 2007). Cognitive-behavioral therapy (CBT) for HD also commonly incorporates home visits and exposure at sites of acquisition (Muroff et al., 2011; Tolin et

al., 2007). Currently, CBT is the most empirically supported intervention for HD. A recent meta-analysis of 12 treatment studies found large within-group effect sizes for CBT for overall hoarding severity and difficulty discarding (Hedges' g = 0.82 and 0.89 respectively; Tolin et al., 2015). These results are encouraging, given reports of the treatment-resistant nature of hoarding (Steketee & Frost, 2003).

At the same time, CBT is lacking in certain regards. First, smaller effect sizes were observed for clutter, acquiring, and impairment (Hedges' g ranged from 0.52 to 0.72), suggesting that CBT does not work uniformly across symptoms (Tolin et al., 2015). Second, 57 to 75% of HD patients continued to exhibit symptom severity within the clinical range at posttreatment (Tolin et al., 2015). Third, CBT can be time-intensive—lasting up to a year in treatment studies—due in part to scheduling issues and lack of client motivation (Steketee et al., 2010; Tolin et al., 2015). Fourth, difficulties with client retention, possibly due to low treatment acceptability, are another problem undermining the effectiveness of CBT (Steketee et al., 2010; Tolin et al., 2007). These issues underscore the potential need for modifications to current CBT protocols, additional sessions following a standard course of CBT for further symptom remission, or development of alternative treatment options for nonresponders.

Acceptance and Commitment Therapy

ACT is an acceptance- and mindfulness-based intervention belonging to the "third wave of behavior therapy" (Hayes, 2004). It differs from traditional CBT by shifting treatment focus to the function of psychological events, rather than their content or form

(Hayes et al., 2006; Hofmann & Asmundson, 2008). That is, ACT does not endeavor to change internal events (e.g., anxiety, cognitions); rather, it works to change their effect (e.g., individual responses to anxiety). The overarching objective of ACT is to create extensive, flexible behavioral repertoires in response to stimuli that typically elicit a narrow range of reactions (Hayes et al., 2006). ACT works toward this aim by fostering psychological flexibility—"the ability to contact the present moment more fully as a conscious human being, and to change or persist in behavior when doing so serves valued ends"—so that individuals can act in ways congruent with their chosen life values in the presence of difficult internal events (Hayes et al., 2006, p. 7). For example, an individual with HD may save objects to avoid distress associated with discarding, which eventually leads to clutter in the home. If having a livable environment is important to the person, then the goal of ACT would be to encourage alternative responses to the distress that adhere more closely to the individual's values, such as being willing to experience the distress and discard items.

Psychological flexibility encompasses six core processes: acceptance, cognitive defusion, contact with the present moment, self-as-context, values, and committed action (Hayes et al., 2006). These processes have been empirically validated in laboratory component studies (Levin, Hildebrandt, Lillis, & Hayes, 2012) and psychological flexibility has been shown to mediate treatment outcomes in ACT, supporting its role as a mechanism of change (Niles et al., 2014; Twohig, Plumb Vilardaga, Levin, & Hayes, 2015). Acceptance targets experiential avoidance and encourages willingness to experience private events as they are, without trying to change their frequency or

form—particularly when doing so produces negative consequences. Defusion describes disentanglement of meaning from thought, such that thoughts can be seen for what they are, rather than what they represent. Practicing defusion disarms thoughts by stripping them of their literal meaning. ACT also uses mindfulness-based strategies, such as being present, which requires being in continuous, nonjudgmental contact with internal and external events as they happen. Self-as-context entails taking the perspective of an observer vis-à-vis inner experiences (e.g., "I am noticing anxiety"), rather than viewing experiences as part of the self (e.g., "I am anxious"). Defining values clarifies desired life directions and allows them to shape behavior. Committed action refers to acting consistently with chosen values. All processes are necessary to develop the skill of psychological flexibility.

An Acceptance and Commitment Therapy Perspective on Hoarding

Evidence from diverse study designs suggests that ACT may be a feasible therapeutic option for clinical hoarding given the links between psychological inflexibility and hoarding pathology. Psychological inflexibility (or weak psychological flexibility) has been found to contribute to the maintenance of hoarding in clinical and nonclinical samples (Ayers et al., 2014; Fernández de la Cruz et al., 2013; Wheaton, Abramowitz, Franklin, Berman, & Fabricant, 2011), though Wheaton, Fabricant, Berman, and Abramowitz (2013) found no significant relationship using a small clinical sample.

Psychological inflexibility in hoarding can manifest as experiential or behavioral

avoidance (Ayers et al., 2014). Experiential avoidance refers to attempts to control internal events, such as thoughts or sensations (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996), reflecting an inability or unwillingness to tolerate distress (e.g., when making decisions about possessions; Ayers et al., 2014; Steketee & Frost, 2003). Behavioral avoidance is typically characterized by saving (avoiding discarding and decision making) and acquiring (avoiding decision making). In a way, behavioral avoidance is the means through which experiential avoidance is achieved (i.e., saving to avoid distress). To the extent that saving and acquiring—core symptoms of HD—can be conceptualized as avoidance strategies, it is evident that avoidance plays an integral role in hoarding.

From an ACT perspective, the function—rather than topography—of avoidance is principal. Identifying the function of avoidance allows for alteration of contingencies to increase probability of adaptive behavior based on idiosyncratic values. One hypothesis is that avoidance in hoarding serves the function of emotion regulation. If saving and acquiring represent attempts to regulate difficult inner experiences, then we would expect the occurrence of intense emotions and impoverished emotion regulation skills to predict hoarding severity. In fact, research shows that hoarding severity is associated with greater emotional reactivity and difficulties with emotion regulation (Shaw et al., 2015; Timpano et al., 2009; Timpano, Shaw, Cougle, & Fitch, 2014), and that psychological inflexibility mediates the link between distress and hoarding symptoms (Ong, Krafft, Levin, & Twohig, in press). Furthermore, hoarding severity has been positively correlated with difficulty engaging in goal-directed behavior (Fernández de la Cruz et al., 2013),

suggesting poor emotion regulation in hoarding detracts from valued living. In addition, self-identification with or intense attachment to possessions and exaggeration of negative consequences associated with discarding denote cognitive fusion, as individuals are unable to dissociate thoughts from their literal meaning. Thus, instead of treating the thought, "I will not be able to deal with losing this item," as a thought, individuals may treat the thought as reality and act accordingly. In this way, cognitive fusion can inhibit flexible, values-driven responses.

Based on this conceptualization, primary therapeutic foci might include increasing willingness to experience distress, fostering defusion from rules about objects, and establishing patterns of values-consistent action in the presence of discomfort and unhelpful cognitions. Clarifying values by which individuals would like their behavior to be guided as well as fostering acceptance of discomfort and uncertainty associated with decision making may reduce indecisiveness and promote adaptive decision making. Training cognitive defusion means reducing the power of private events over organismic action, broadening behavioral repertoires. Furthermore, given low levels of motivation in hoarding (Tolin et al., 2007), ACT's emphasis on chosen life values and concomitant behavioral change may be useful in augmenting treatment adherence. Of note, these components mirror the motivational interviewing component of CBT for HD, which has been found to be helpful in treatment (Muroff et al., 2011).

ACT could also address other elements in the cognitive behavioral model of hoarding, such as poor attentional focus and disorganization (Frost & Hartl, 1996). For example, low mindfulness has been associated with attention problems in attention deficit

hyperactivity disorder, and mindfulness training—a linchpin of ACT—has been found to improve attentional functioning (Jha, Krompinger, & Baime, 2007; Smalley et al., 2009). Greater attentional focus may facilitate efficient discarding and organizing. Furthermore, individuals with hoarding demonstrate under-inclusive categorization patterns specific to personal belongings, creating more unique categories for possessions, but not other objects (Wincze et al., 2007). This finding suggests that those who hoarding do not inherently lack organizational abilities and are, in fact, able to organize items devoid of personal significance. Defusion can be used to separate meaning from objects and encourage more helpful categorization.

Although ACT has not been tested with HD, Twohig, Hayes, and Masuda (2006) administered an 8-session ACT intervention to participants with OCD—one of whom presented with hoarding compulsions—and found clinically significant improvement in OCD symptom severity, which was maintained at 3-month follow-up. By the end of treatment, the hoarding participant had discarded "10 truckloads of paper material" (p. 8), demonstrating the efficacy of an ACT intervention for this individual (Twohig et al., 2006). In addition, Twohig et al. (2010) reported significant differences in symptom severity between an ACT and a progressive relaxation training condition at posttreatment and follow-up among participants with OCD, of whom 31.6% presented with the hoarding subtype. Although Twohig et al. (2010) did not analyze their data by OCD subtype, their finding of greater overall improvement for the ACT condition relative to their control group suggests that ACT may work for individuals with hoarding. ACT has also been found to be effective for treating other conditions linked to HD, such as social

phobia (Craske et al., 2014), trichotillomania (Crosby, Dehlin, Mitchell, & Twohig, 2012), and anxiety disorders (Arch et al., 2012). Moreover, ACT resulted in symptom reduction in a clinical sample of treatment-resistant individuals with varying diagnoses (including anxiety and depression; Clarke, Kingston, James, Bolderston, & Remington, 2014), signaling its possible potency for a recalcitrant condition like HD.

In summary, much of the theory and research reviewed—including evidence of the effectiveness of ACT for obsessive-compulsive and related disorders—tentatively support the potential utility of treating HD with ACT and substantiate the need to empirically examine the application of ACT to HD. If acceptance-based techniques are found to be effective in reducing hoarding symptoms, ACT may either be a viable alternative treatment option for individuals with HD who have not benefited from CBT or simply provide another treatment option for a treatment-resistant disorder.

Current Study

The current study used an experimental design and analog nonclinical sample (i.e., college students with elevated hoarding) to test the efficacy of acceptance-based training relative to psychoeducation on hoarding symptoms. Analog studies can be useful for examining such factors as mechanisms of change, efficacy of intervention components, and potential treatment moderators, while using less resources than randomized controlled trials (Abramowitz et al., 2014; Marcks & Woods, 2007; Ritzert, Forsyth, Berghoff, Barnes-Holmes, & Nicholson, 2015). Abramowitz et al. (2014) also noted that analog samples have been used in treatment development to provide

preliminary data on the effectiveness of new interventions. Moreover, the impact of similar brief interventions on clinical behaviors has been evaluated in previous experiments in the tradition of laboratory-based component studies (Marcks & Woods, 2007; Morrison, Madden, Odum, Friedel, & Twohig, 2014; Ritzert et al., 2015). Given that the efficacy of ACT with regard to HD has not been empirically assessed, conducting an analog study at this initial stage of treatment development is both logical and appropriate. This investigation represents an exploratory foray into a broader program of research evaluating the effectiveness of acceptance- and mindfulness-based interventions for significant hoarding.

Following the intervention, participants completed an in vivo discarding task and self-report measures. They also completed an online follow-up survey one week after the experiment for a test of durability of treatment effects. We hypothesized that, relative to psychoeducation, acceptance training would increase in vivo discarding during the behavioral task as well as decrease hoarding severity, hoarding cognitions, and psychological inflexibility over the course of the study.

CHAPTER III

METHOD

Participants

Participants were recruited from undergraduate psychology classes at Utah State University (USU) through class announcements and online postings. To be eligible for the current study, individuals had to complete the Saving Inventory—Revised (SI-R) in a prior online survey and meet the following criteria: (1) score of at least 37 on the SI-R (1 SD above nonclinical mean; Coles, Frost, Heimberg, & Steketee, 2003; Wheaton et al., 2011), (2) at least 18 years of age, and (3) ability to complete measures in English.

Measures

Background Information

This questionnaire contained items on demographic information (gender, age, ethnicity, marital status).

Saving Inventory–Revised

The Saving Inventory–Revised (SI-R; Frost, Steketee, & Grisham, 2004). is a 23-item self-report measure comprising three subscales: difficulty discarding, clutter, and excessive acquisition (see Appendix A). Sample questions include: “How distressing do you find the task of throwing things away?” and “How strong is your urge to buy or acquire free things for which you have no immediate use?” Items on the SI-R are scored between 0 and 4, with higher scores indicating greater hoarding severity. Internal

consistency (α = .92 to .94 for full scale; α = .80 to .93 for subscales), test-retest reliability (*r* = .86 for full scale, and *r* = .78 to .90 for subscales over two to four weeks), and convergent and divergent validity (*r* = .54 to .73 vs. *r* = .22 to .38) have been established for the scale (Frost et al., 2004). Cronbach's αs ranged from .83 to .91 in the current sample, indicating good to excellent internal consistency.

Saving Cognitions Inventory

The Saving Cognitions Inventory (SCI; Steketee et al., 2003) is a 24-item self-report measure that evaluates maladaptive beliefs about and emotional attachment to possessions (see Appendix A). It is composed of four subscales: emotional attachment, control, responsibility, and memory. Each item on the SCI represents a thought associated with one of the subscales. Items include: "I could not tolerate it if I were to get rid of this" and "This possession is equivalent to the feelings I associate with it." Participants are asked to rate the extent to which they had each thought when deciding whether or not to discard something in the past week, from 1 (not at all) to 7 (very much). The scale has demonstrated very good to excellent internal consistency (α = .96 for full scale; α = .86 to .95 for subscales), as well as convergent (*r* = .60 to .80) and discriminant validity (r = .39 to .58; Steketee et al., 2003). Cronbach's αs ranged from .87 to .94 in the current sample, indicating good to excellent internal consistency.

Acceptance and Action Questionnaire–II

The Acceptance and Action Questionnaire – II *(AAQ-II; Bond et al., 2011)* is a 7-item self-report measure of psychological inflexibility. Items are scored from 1 (never

true) to 7 (always true), and higher scores suggest greater psychological inflexibility (see Appendix A). An example of a scale item is: "I worry about not being able to control my worries and feelings." The AAQ-II has demonstrated good internal consistency (α = .78 to .88), test-retest reliability (r = .81 over 3 months; r = .79 over 12 months), convergent validity (r = .49 to .71), and discriminant validity (|r| = .09; Bond et al., 2011). Cronbach's αs ranged from .90 to .95 in the current sample, indicating excellent internal consistency.

Difficulty Discarding

Difficulty discarding was measured by number of items discarded and/or donated in the discarding behavioral task (range = 0 to 5).

Homework Completion

Participants provided ratings from 1 (0%) to 5 (100%) for the amount of homework they completed as well as the amount of effort they put into achieving the goal they set during the lab session (see Appendix A). Scores on each item were summed to create a measure for overall homework completion (range = 2 to 10). This scale showed good internal consistency (α = .84).

Procedure

Study procedures were approved by a university institutional review board and participants provided informed consent before engaging in the study.

Study Instructions

Before arriving in the lab, participants were instructed to bring five items that met the following criteria: (1) owned by participants, (2) low monetary value (to avoid the confound of monetary value of items), (3) not needed or used in the past year (to avoid the confound of active use), (4) other people might get rid of the item, and (5) easily transportable. In addition, the item had to receive a score of ≥4 on a scale of 1 to 5 for at least one of the following dimensions: importance, distress or discomfort associated with letting go of item, and unwillingness to let go of item. These criteria are intended to approximate the kind of items individuals with hoarding typically possess and have difficulty discarding (Frost & Hartl, 1996; Nordsletten & Mataix-Cols, 2012).

Pretest

At the start of the experiment, participants completed pretest measures (i.e., SI-R, SCI, AAQ-II) on Qualtrics, an online survey platform, using a computer in the assessment room.

Experimental Manipulation

A trained graduate student administered both study interventions under the supervision of a licensed clinical psychologist (Dr. Michael Twohig). Each intervention was prefaced by the rationale for the approach used as well as a brief assessment of the impact of saving and acquiring on participants' functioning.

The acceptance condition was a 75-minute acceptance-based intervention primarily focused on acceptance, cognitive defusion, and values (see Appendix B). Other

ACT processes were highlighted as indicated by participants' specific struggles. The general format of the intervention began with assessment, identifying values, teaching acceptance and defusion, clarifying confusion, and going over homework. Because training was individualized to participants based on the brief assessment conducted at the outset of the session, it varied across participants, though skills covered tended to overlap (e.g., being open to the fear of regret associated with discarding, disentangling from thoughts about the need to save possessions, and connecting with the reasons underlying the desire to change saving behavior). For homework, participants articulated their values as well as a specific behavioral commitment in line with those values and were instructed to follow through on behavior commitment over the following week (see Appendix C).

The psychoeducation condition was also 75 minutes long (see Appendix D). In this condition, participants received psychoeducation about hoarding (diagnostic criteria for HD, cognitive-behavioral model of hoarding) after the assessment. Then, they watched a 40-minute episode of *Hoarders* to expose them to real-life examples of clinically significant hoarding, followed by a discussion on the content of the episode as well as how elements in the episode were relevant to their own struggles with saving. To control for the amount of talking in which participants engaged across conditions, the psychoeducation condition was set up as a discussion rather than a lecture. The psychoeducation homework was a self-monitoring form for participants to track their saving and discarding behavior over the following week (see Appendix E).

Behavioral Task

Participants were prompted to consider discarding, donating, or keeping the items

they brought with them. The experimenter also reminded them that their decision would not affect their participation in any way.

Posttest

At the end of the experiment, participants completed posttest measures (i.e., SI-R, SCI, AAQ-II) on the same computer in the assessment room.

One-Week Follow-Up

One week after the study visit, participants were emailed a Qualtrics link to a follow-up battery containing the SI-R, SCI, AAQ-II, and homework completion items. They were instructed to complete the measures within three days.

Compensation

Participants received course credit as determined by their instructor for participation in the study.

Analyses

Statistical analyses were conducted with R in RStudio (R Core Team, 2015; RStudio Team, 2015), using the following packages: tidyverse (Wickham, 2017), lme4 (Bates, Maechler, Bolker, & Walker, 2015), and texreg (Leifeld, 2013). Independent samples *t* tests were used to compare groups on key dependent variables (SI-R, SCI, AAQ-II) at baseline. A linear regression was used to test the effect of condition on number of items discarded during the behavioral task. Multilevel modeling with maximum likelihood estimation was used to evaluate the effect of condition on the SI-R,

SCI, and AAQ-II over time (from preintervention to 1-week follow-up). We first compared model fit indices for a linear mixed effects model to a quadratic mixed effects model to determine the appropriate function for the time variable. For all three variables, the quadratic model fit significantly better based on the χ^2 difference statistic (*p*s < .05), thus, time was specified as a quadratic function. The model for each outcome of interest included condition, time (days), and the interaction term for condition and time as predictors.

CHAPTER IV

RESULTS

Twenty-four participants were randomly assigned to the acceptance condition and 23 to the psychoeducation condition ($N = 47$). There were no significant differences between groups on the SI-R, SCI, or AAQ-II at baseline ($ps > .1$). In addition, mean homework completion did not significantly differ between groups ($M_{AT} = 8.09$, $M_{PE} = 7.95$, $p = .83$); mean scores indicated that both groups reported relatively high rates of homework completion.

Demographic Information

Due to a data collection error, demographic information was only obtained from 17 participants (36% of full sample), however, these descriptive statistics likely approximate the demographic profile of our full sample given that the recruitment method used in the present study has typically produced relatively homogenous samples (e.g., Morrison et al., 2014; Ong et al., in press). Our subsample had a mean age of 21.4 years ($SD = 6.0$ years, range = 18 to 41 years), with 64.7% identifying as female and 88.2% as European American/White. Eighty-two percent were single.

Effect of Condition on Outcomes

Participants in the acceptance condition discarded 0.85 more items ($SE = 0.42$; $M_{AT} = 3.38$) on average out of five possible items relative to the psychoeducation condition ($M_{PE} = 2.52$), but this difference was not statistically significant ($t = 2.01$, $R^2 =$

.082, $p = .051$).

Results from the mixed effects models are presented in Table 1. There was no significant main effect of condition or interaction effect of condition by time for any outcome measure. There was a main effect of time on SI-R and SCI, indicating significant decreases in hoarding severity and hoarding cognitions over time across participants (ps < .01). No main effect of time was observed for the AAQ-II. Effect sizes for change in SI-R and SCI scores from baseline to one-week follow-up were large (Hedges' gs = 1.20 and 0.81, respectively); a small effect was observed for the decrease in AAQ-II total score (Hedges' $g = 0.42$). Mean scores over time are reported in Table 2 and the trajectories of each dependent variable are illustrated in Figures 1-3.

Table 1

Results from Mixed Effects Models for Saving Inventory—Revised, Saving Cognitions Inventory, and Acceptance and Action Questionnaire—II with Time (Days) and Condition as Predictors

	Saving Inventory-Revised			Saving Cognitions Inventory			Acceptance and Action Questionnaire—II		
Predictor	*n*	*β*	*SE*	*n*	*β*	*SE*	*n*	*β*	*SE*
Intercept		49.44***	1.99		88.08***	4.52		2.77***	1.95
Condition[a]		-3.71	2.99		-4.73	6.75		-2.53	2.80
Days		-9.90***	2.24		-14.82**	4.68		-2.06	1.33
Days^2		1.12***	0.30		1.65**	0.63		0.24	0.18
Condition x days		2.81	3.12		4.15	6.64		-0.45	1.87
Condition x days^2		-0.37	0.42		-0.44	0.90		0.07	0.25
No. of observations	137			135			138		
No. of participants	47			47			47		

[a] Reference group is psychoeducation.
** $p < .01$.
*** $p < .001$.

Table 2

Means and Standard Deviations for Saving Inventory—Revised, Saving Cognitions Inventory, and Acceptance and Action Questionnaire—II at Preintervention, Postintervention, and 1-Week Follow-Up

	Preintervention			Postintervention			1-week Follow-up		
Measures	Mean	*SD*	*n*	Mean	*SD*	*n*	Mean	*SD*	*n*
Saving Inventory-Revised									
Overall	48.3	9.1	46	40.7	9.7	47	34.6	12.2	44
Psychoeducation	50.4	10.5	22	41.4	8.9	23	35.2	10.7	21
Acceptance-based training	46.5	7.3	24	40.1	0.5	24	34.0	3.6	23
Saving Cognitions Inventory									
Overall	87.8	0.0	46	75.8	4.3	46	69.1	5.6	43
Psychoeducation	89.8	9.5	23	76.7	4.3	23	67.5	6.5	20
Acceptance-based training	85.7	0.7	23	74.9	4.8	23	70.5	5.3	23
Acceptance and Action Questionnaire-II									
Overall	27.4	8.6	47	25.4	9.9	47	24.8	0.8	44
Psychoeducation	28.7	9.1	23	26.9	0.9	23	26.0	1.4	21
Acceptance-based training	26.2	8.2	24	24.0	8.9	24	23.7	0.4	23

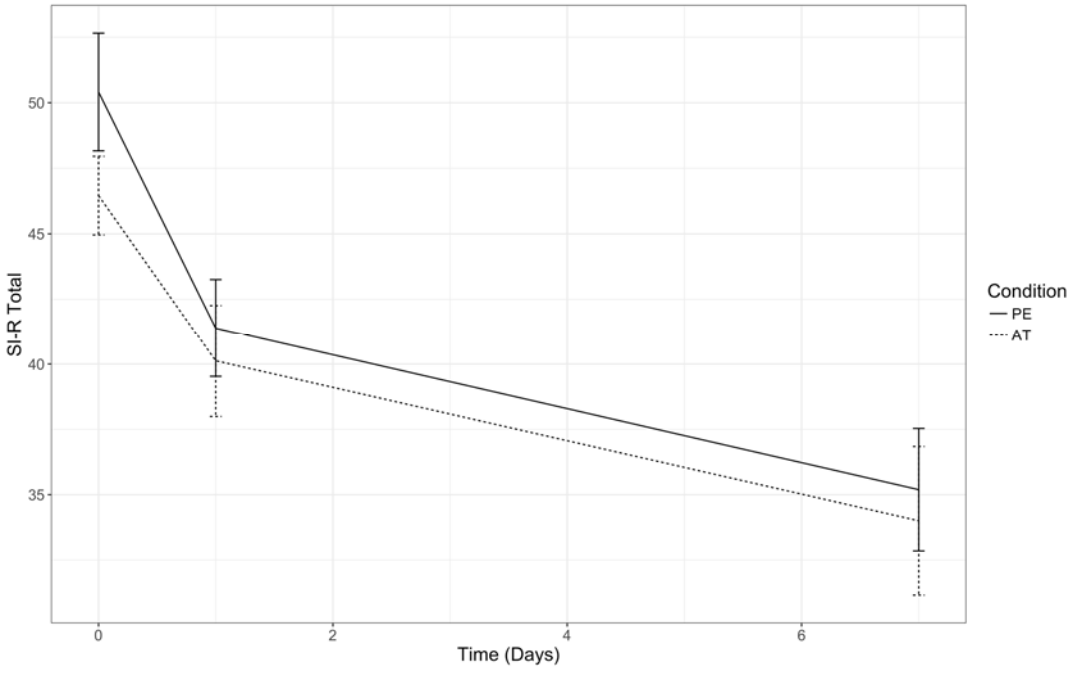


Figure 1. Line graph of Saving Inventory—Revised scores from baseline to 1-week follow-up for acceptance training and psychoeducation.

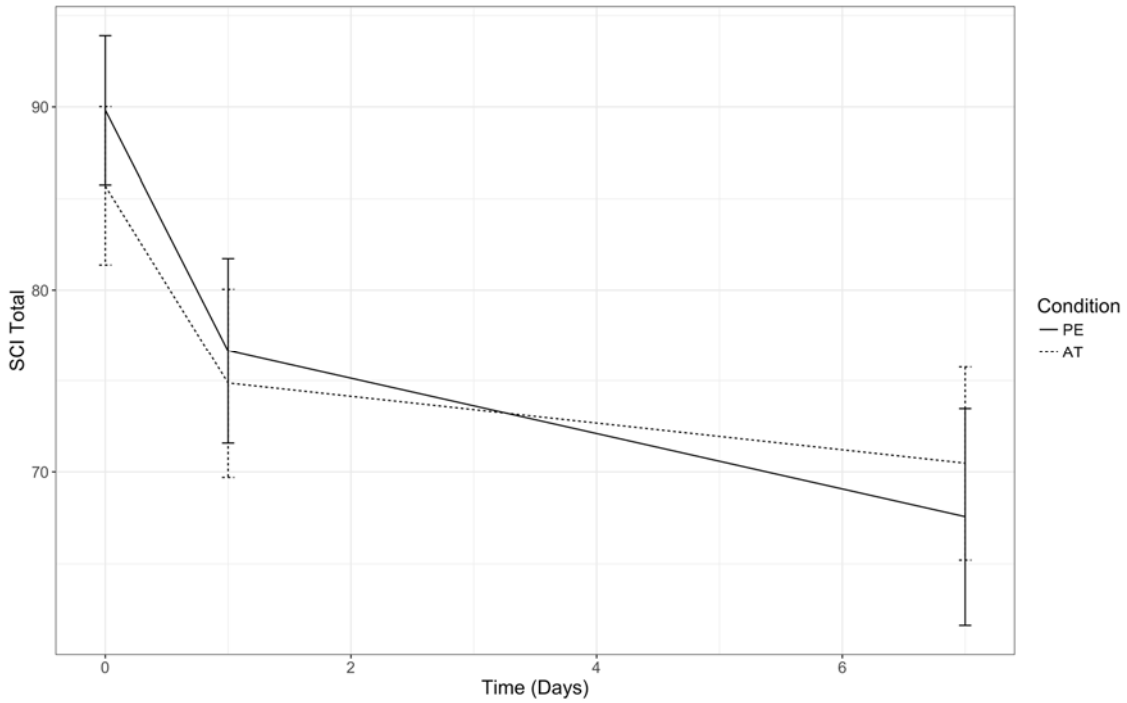


Figure 2. Line graph of Saving Cognitions Inventory scores from baseline to 1-week follow-up for acceptance training and psychoeducation.

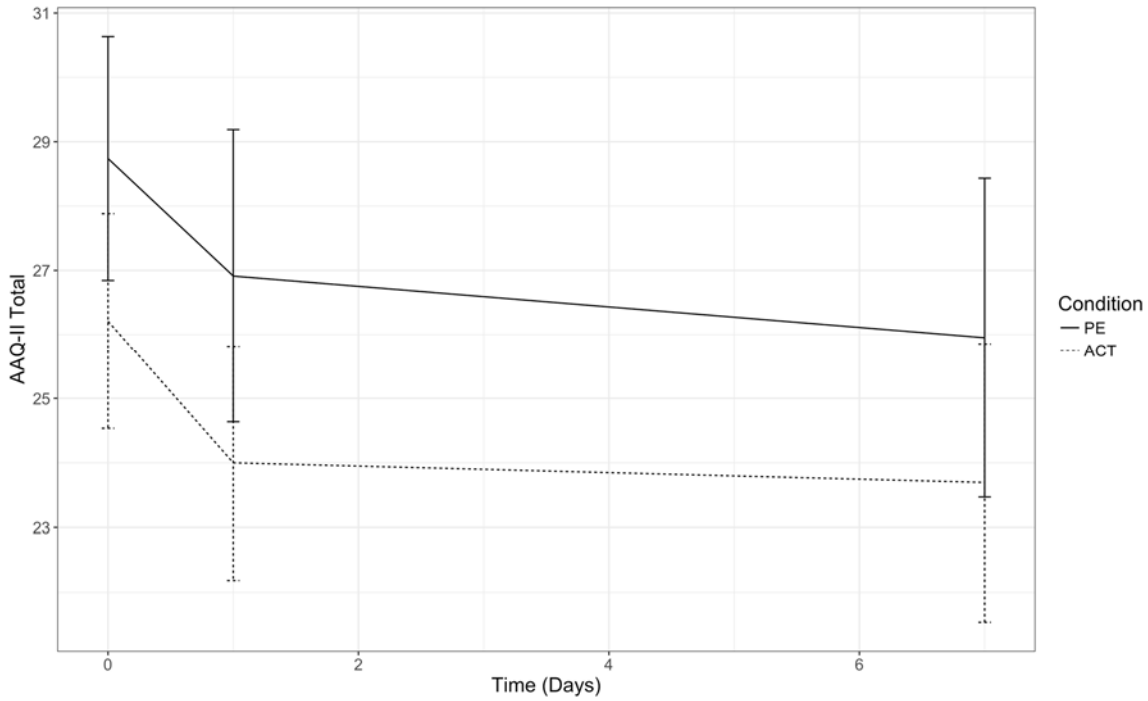


Figure 3. Line graph of Acceptance and Action Questionnaire—II scores from baseline to one-week follow-up for acceptance training and psychoeducation.

CHAPTER V

DISCUSSION

Summary

Acceptance-based training and psychoeducation each significantly reduced hoarding severity and hoarding cognitions from baseline to one-week follow-up among college students who reported elevated hoarding symptoms. The effect sizes observed in the current study are comparable to those reported for pre- to posttreatment improvement in a meta-analysis of CBT for HD (Tolin et al., 2015), suggesting that symptom reduction in the present study was of clinical significance. In addition, participants discarded/ donated approximately three out of five items following the study intervention. We cannot make strong inferences about the significance of this figure given that few studies have used in vivo discarding of personal items as an outcome variable. However, it is notable that participants discarded/donated 60% of items that were selected specifically because they were difficult to let go of. These findings support the utility of both acceptance-based techniques as well as psychoeducation for altering difficulty discarding in a nonclinical sample with elevated hoarding.

To date, acceptance- or mindfulness-based techniques have not been explicitly woven into treatment protocols for hoarding disorder so the present investigation represents the first empirical test of the effectiveness of an acceptance-based protocol for hoarding. The significant changes in hoarding severity and cognitions from baseline to follow-up offer preliminary support for an acceptance- and mindfulness-based

conceptualization of and corresponding therapeutic approach to hoarding, given that they suggest hoarding symptoms can be shifted using acceptance techniques. The implication is that an alternative—potentially more amenable—treatment option may exist for individuals with problematic hoarding who do not respond to cognitive-behavioral therapies. At the same time, that psychological flexibility did not shift correspondingly with symptom reduction appears to undermine the theory of change underlying ACT. It could be that psychological flexibility did not explain improvement in outcomes in the present study—especially given its short duration. After all, psychological flexibility is a skill that requires consistent engagement to learn and successfully implement so significant changes in a week would have been unlikely to begin with (Morrison et al., 2014). A longer-term examination of the temporal relationship between psychological flexibility and symptoms would provide a more robust test of the role of psychological flexibility as a mechanism of sustainable change.

Psychoeducation is an integral component of cognitive-behavioral interventions for HD and it has been proposed to be helpful in the context of a stepped care model for the treatment of HD (Frost, Ruby, & Shuer, 2012; Muroff, Steketee, Bratiotis, & Ross, 2012; Steketee et al., 2010). The sizable impact of a single psychoeducation session on hoarding symptoms in the present study provides some support for use of psychoeducation—particularly when severity is in the moderate range—as an initial step to treatment engagement. Furthermore, given that providing psychoeducation poses a relatively low burden on mental health resources, it may be an efficient approach to early intervention for individuals struggling with hoarding.

Conversely, our younger college student sample with elevated hoarding is not representative of a typical hoarding clinical sample who tend to be older (means range from 49 to 74 years) and who exhibit extremely high levels of hoarding severity at baseline (>4 SDs above mean; Tolin et al., 2015). The difference in demographic profile might partly explain the large effect sizes in the current study. First, evidence suggests that younger age is related to significantly better outcomes with respect to hoarding severity (Tolin et al., 2015). Second, probability of onset of at least moderately severe hoarding increases with age, reaching a plateau between 36 and 40 years (Tolin, Meunier, Frost, & Steketee, 2010). Thus, the study intervention could have been rendered more efficacious by its introduction prior to development of more severe—and potentially entrenched—hoarding patterns. Moreover, we note that homework adherence in our sample was high, which is less common in clinical samples and might also have contributed to improvement in outcomes (Simpson et al., 2011).

Little research has been conducted on early interventions for problematic hoarding. While we appreciate the necessity of conducting clinical research among individuals with severe, chronic hoarding symptomatology, this study suggests that early intervention approaches may also have merit in terms of symptom improvement and cost-effectiveness. Clutter has been conceptualized as a consequence of difficulty discarding and acquisition (APA, 2013), and it is likely that the behavioral manifestation of HD occurs before accumulation of clutter. Thus, focusing on modifying maladaptive saving and acquiring habits prior to the development of significant clutter may be an easier means of intervention.

That acceptance-based training and psychoeducation alone each resulted in significant decreases in hoarding outcomes calls for the need to use additive component designs to determine which elements of HD treatment are most cost-effective, necessary, and sufficient. At present, cognitive-behavioral protocols for hoarding comprise multiple elements, including motivational interviewing, home visits, cognitive restructuring, skills training, exposure, and contingency management, and tend to require many sessions (range = 13 to 35) relative to treatment for other mental health conditions (Muroff et al., 2012; Tolin et al., 2015; Worden, Bowe, & Tolin, 2017). Identifying the most vital ingredients using component studies has the potential to streamline treatment of hoarding and alleviate therapeutic burden on clients and clinicians.

Limitations

Because both study conditions were "active," we were unable to estimate the contribution of demand characteristics or placebo effects to the improvements demonstrated in our study. For example, the high face validity of items on the SI-R and SCI might have facilitated biased self-reporting. It is also possible that self-reported changes were not correlated with actual changes in behavior; future research would be strengthened by multimethod forms of assessment (e.g., self-report, clinician-report, behavioral observation). These limitations underscore the need for replication of current findings to ascertain the applicability of acceptance-based interventions to clinical hoarding. In addition, we did not measure potential mechanisms of change besides psychological flexibility, thus, we could not determine which aspects of the interventions

resulted in the observed changes. The components shared by both interventions were talking to someone about struggles with hoarding as well as gaining insight into hoarding as a potential problem. For a nonclinical sample, these elements could have been sufficient to galvanize behavioral change though maintenance of this change beyond one week was not measured. Mediational tests in a larger sample using an experimental design over a longer period of time might help to illuminate active processes of change. Furthermore, the homogeneity of our sample (mostly European American/White, younger students) precludes generalizability of our findings to different populations. Regardless, it would be premature to make generalizations about the effectiveness of acceptance- and mindfulness-based therapies for HD based on an analog study; replication of findings with a protocol that more closely resembles a full course of psychotherapy and a diverse clinical sample would afford a more ecologically valid test of whether such approaches do in fact constitute a feasible treatment for HD.

REFERENCES

A-Tjak, J. G. L., Davis, M. L., Morina, N., Powers, M. B., Smits, J. A., & Emmelkamp, P. M. (2015). A meta-analysis of the efficacy of acceptance and commitment therapy for clinically relevant mental and physical health problems. *Psychotheapy and Psychosomatics, 84*(1), 30-36. doi:10.1159/000365764

Abramowitz, J. S., Fabricant, L. E., Taylor, S., Deacon, B. J., McKay, D., & Storch, E. A. (2014). The relevance of analogue studies for understanding obsessions and compulsions. *Clinical Psychology Review, 34*(3), 206-217. doi:10.1016/j.cpr.2014.01.004

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Arch, J. J., Eifert, G. H., Davies, C. D., Plumb Vilardaga, J. C., Rose, R. D., & Craske, M. G. (2012). Randomized clinical trial of cognitive behavioral therapy (CBT) versus acceptance and commitment therapy (ACT) for mixed anxiety disorders. *Journal of Consulting and Clinical Psychology, 80*(5), 750-765. doi:10.1037/a0028310

Ayers, C. R., Castriotta, N., Dozier, M. E., Espejo, E. P., & Porter, B. (2014). Behavioral and experiential avoidance in patients with hoarding disorder. *Journal of Behavior Therapy and Experimental Psychiatry, 45*(3), 408-414. doi:10.1016/j.jbtep.2014.04.005

Bates, D., Maechler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software, 67*(1), 1-48. doi:10.18637/jss.v067.i01

Bond, F. W., Hayes, S. C., Baer, R. A., Carpenter, K. M., Guenole, N., Orcutt, H. K., . . . Zettle, R. D. (2011). Preliminary psychometric properties of the Acceptance and Action Questionnaire-II: A revised measure of psychological inflexibility and experiential avoidance. *Behavior Therapy, 42*(4), 676-688. doi:10.1016/j.beth.2011.03.007

Clarke, S., Kingston, J., James, K., Bolderston, H., & Remington, B. (2014). Acceptance and commitment therapy group for treatment-resistant participants: A randomized controlled trial. *Journal of Contextual Behavioral Science, 3*(3), 179-188. doi:10.1016/j.jcbs.2014.04.005

Coles, M. E., Frost, R. O., Heimberg, R. G., & Steketee, G. (2003). Hoarding behaviors in a large college sample. *Behaviour Research and Therapy, 41*(2), 179-194. doi:10.1016/s0005-7967(01)00136-x

Craske, M. G., Niles, A. N., Burklund, L. J., Wolitzky-Taylor, K. B., Vilardaga, J. C., Arch, J. J., ... Lieberman, M. D. (2014). Randomized controlled trial of cognitive behavioral therapy and acceptance and commitment therapy for social phobia: Outcomes and moderators. *Journal of Consulting and Clinical Psychology, 82*(6), 1034-1048. doi:10.1037/a0037212

Crosby, J. M., Dehlin, J. P., Mitchell, P. R., & Twohig, M. P. (2012). Acceptance and commitment therapy and habit reversal training for the treatment of trichotillomania. *Cognitive and Behavioral Practice, 19*(4), 595-605. doi:10.1016/j.cbpra.2012.02.002

Fernández de la Cruz, L., Landau, D., Iervolino, A. C., Santo, S., Pertusa, A., Singh, S., & Mataix-Cols, D. (2013). Experiential avoidance and emotion regulation difficulties in hoarding disorder. *Journal of Anxiety Disorders, 27*(2), 204-209. doi:10.1016/j.janxdis.2013.01.004

Frost, R. O., & Hartl, T. L. (1996). A cognitive-behavioral model of compulsive hoarding. *Behaviour Research and Therapy, 34*(4), 341-350. doi:10.1016/0005-7967(95)00071-2

Frost, R. O., Ruby, D., & Shuer, L. J. (2012). The Buried in Treasures Workshop: Waitlist control trial of facilitated support groups for hoarding. *Behaviour Research and Therapy, 50*(11), 661-667. doi:10.1016/j.brat.2012.08.004

Frost, R. O., Steketee, G., & Grisham, J. (2004). Measurement of compulsive hoarding: saving inventory-revised. *Behaviour Research and Therapy, 42*(10), 1163-1182. doi:10.1016/j.brat.2003.07.006

Grisham, J. R., Brown, T. A., Savage, C. R., Steketee, G., & Barlow, D. H. (2007). Neuropsychological impairment associated with compulsive hoarding. *Behaviour Research and Therapy, 45*(7), 1471-1483. doi:10.1016/j.brat.2006.12.008

Hartl, T. L., Duffany, S. R., Allen, G. J., Steketee, G., & Frost, R. O. (2005). Relationships among compulsive hoarding, trauma, and attention-deficit/hyperactivity disorder. *Behaviour Research and Therapy, 43*, 269-276. doi:10.1016/j.brat.2004.02.002

Hartl, T. L., Frost, R. O., Allen, G. J., Deckersbach, T., Steketee, G., Duffany, S. R., & Savage, C. R. (2004). Actual and perceived memory deficits in individuals with compulsive hoarding. *Depression and Anxiety, 20*(2), 59-69. doi:10.1002/da.20010

Hayes, S. C. (2004). Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies. *Behavior Therapy, 35*(4), 639-665. doi:10.1016/S0005-7894(04)80013-3

Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: model, processes and outcomes. *Behaviour Research and Therapy, 44*(1), 1-25. doi:10.1016/j.brat.2005.06.006

Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Counsulting and Clinical Psychology, 64*(6), 1152-1168. doi:10.1037/0022-006X.64.6.1152

Hofmann, S. G., & Asmundson, G. J. (2008). Acceptance and mindfulness-based therapy: New wave or old hat? *Clinical Psychology Review, 28*(1), 1-16. doi:10.1016/j.cpr.2007.09.003

Iervolino, A. C., Perroud, N., Fullana, M. A., Guipponi, M., Cherkas, L., Collier, D. A., & Mataix-Cols, D. (2009). Prevalence and heritability of compulsive hoarding: A twin study. *American Journal of Psychiatry, 166*, 1156-1161. doi:10.1176/appi.ajp.2009.08121789

Ivanov, V. Z., Mataix-Cols, D., Serlachius, E., Lichtenstein, P., Anckarsater, H., Chang, Z., ... Ruck, C. (2013). Prevalence, comorbidity and heritability of hoarding symptoms in adolescence: A population based twin study in 15-year olds. *PLoS One, 8*(7), e69140. doi:10.1371/journal.pone.0069140

Jha, A. P., Krompinger, J., & Baime, M. J. (2007). Mindfulness training modifies subsystems of attention. *Cognitive, Affective, & Behavioral Neuroscience, 7*(2), 109-119. doi:10.3758/cabn.7.2.109

Leifeld, P. (2013). texreg: Conversion of statistical model output in R to LaTeX and HTML tables. *Journal of Statistical Software, 55*(8), 1-24. doi:10.18637/jss.v055.i08

Levin, M. E., Hildebrandt, M. J., Lillis, J., & Hayes, S. C. (2012). The impact of treatment components suggested by the psychological flexibility model: A meta-analysis of laboratory-based component studies. *Behavior Therapy, 43*(4), 741-756. doi:10.1016/j.beth.2012.05.003

Marcks, B. A., & Woods, D. W. (2007). Role of thought-related beliefs and coping strategies in the escalation of intrusive thoughts: An analog to obsessive-compulsive disorder. *Behaviour Research and Therapy, 45*(11), 2640-2651. doi:10.1016/j.brat.2007.06.012

Morrison, K. L., Madden, G. J., Odum, A. L., Friedel, J. E., & Twohig, M. P. (2014). Altering impulsive decision making with an acceptance-based procedure. *Behavior Therapy, 45*, 630-639. doi:10.1016/j.beth.2014.01.001

Mueller, A., Mitchell, J. E., Crosby, R. D., Glaesmer, H., & de Zwaan, M. (2009). The prevalence of compulsive hoarding and its association with compulsive buying in a German population-based sample. *Behaviour Research and Therapy, 47*(8), 705-709. doi:10.1016/j.brat.2009.04.005

Muroff, J., Bratiotis, C., & Steketee, G. (2011). Treatment for hoarding behaviors: A review of the evidence. *Clinical Social Work Journal, 39*(4), 406-423. doi:10.1007/s10615-010-0311-4

Muroff, J., Steketee, G., Bratiotis, C., & Ross, A. (2012). Group cognitive and behavioral therapy and bibliotherapy for hoarding: A pilot trial. *Depression and Anxiety, 29*(7), 597-604. doi:10.1002/da.21923

Muroff, J., Steketee, G., Rasmussen, J., Gibson, A., Bratiotis, C., & Sorrentino, C. (2009). Group cognitive and behavioral treatment for compulsive hoarding: a preliminary trial. *Depression and Anxiety, 26*(7), 634-640. doi:10.1002/da.20591

Niles, A. N., Burklund, L. J., Arch, J. J., Lieberman, M. D., Saxbe, D., & Craske, M. G. (2014). Cognitive mediators of treatment for social anxiety disorder: comparing acceptance and commitment therapy and cognitive-behavioral therapy. *Behavior Therapy, 45*(5), 664-677. doi:10.1016/j.beth.2014.04.006

Nordsletten, A. E., & Mataix-Cols, D. (2012). Hoarding versus collecting: Where does pathology diverge from play? *Clinical Psychology Review, 32*(3), 165-176. doi:10.1016/j.cpr.2011.12.003

Oglesby, M. E., Medley, A. N., Norr, A. M., Capron, D. W., Korte, K. J., & Schmidt, N. B. (2013). Intolerance of uncertainty as a vulnerability factor for hoarding behaviors. *Journal of Affective Disorders, 145*(2), 227-231. doi:10.1016/j.jad.2012.08.003

Ong, C. W., Krafft, J., Levin, M. E., & Twohig, M. P. (in press). An examination of the role of psychological inflexibility in hoarding using multiple mediator models. *Journal of Cognitive Psychotherapy, 32*(2).

R Core Team. (2015). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing.

Ritzert, T. R., Forsyth, J. P., Berghoff, C. R., Barnes-Holmes, D., & Nicholson, E. (2015). The impact of a cognitive defusion intervention on behavioral and psychological flexibility: An experimental evaluation in a spider fearful non-clinical sample. *Journal of Contextual Behavioral Science, 4*(2), 112-120. doi:10.1016/j.jcbs.2015.04.001

RStudio Team. (2015). *RStudio: Integrated development for R*. Retrieved from http://www.rstudio.com/

Shaw, A. M., Timpano, K. R., Steketee, G., Tolin, D. F., & Frost, R. O. (2015). Hoarding and emotional reactivity: the link between negative emotional reactions and hoarding symptomatology. *Journal of Psychiatric Research, 63*, 84-90. doi:10.1016/j.jpsychires.2015.02.009

Simpson, H. B., Maher, M. J., Wang, Y., Bao, Y., Foa, E. B., & Franklin, M. E. (2011). Patient adherence predicts outcome from cognitive behavioral therapy in obsessive-compulsive disorder. *Journal of Consulting and Clinical Psychology, 79*(2), 247-252. doi:10.1037/a0022659

Smalley, S. L., Loo, S. K., Hale, T. S., Shrestha, A., McGough, J., Flook, L., & Reise, S. (2009). Mindfulness and attention deficit hyperactivity disorder. *Journal of Clinical Psychology, 65*(10), 1087-1098. doi:10.1002/jclp.20618

Steketee, G., & Frost, R. O. (2003). Compulsive hoarding: Current status of the research. *Clinical Psychology Review, 23*(7), 905-927. doi:10.1016/j.cpr.2003.08.002

Steketee, G., Frost, R. O., & Kyrios, M. (2003). Cognitive aspects of compulsive hoarding. *Cognitive Therapy and Research, 27*(4), 463-479. doi:10.1023/A:1025428631552

Steketee, G., Frost, R. O., Tolin, D. F., Rasmussen, J., & Brown, T. A. (2010). Waitlist-controlled trial of cognitive behavior therapy for hoarding disorder. *Depression and Anxiety, 27*(5), 476-484. doi:10.1002/da.20673

Steketee, G., Frost, R. O., Wincze, J. P., Greene, K. A. I., & Douglass, H. (2000). Group and individual treatment of compulsive hoarding: A pilot study. *Behavioural and Cognitive Psychotherapy, 28,* 259-268. doi:10.1017/S1352465800003064

Timpano, K. R., Buckner, J. D., Richey, J. A., Murphy, D. L., & Schmidt, N. B. (2009). Exploration of anxiety sensitivity and distress tolerance as vulnerability factors for hoarding behaviors. *Depression and Anxiety, 26*(4), 343-353. doi:10.1002/da.20469

Timpano, K. R., Exner, C., Glaesmer, H., Rief, W., Keshaviah, A., Brähler, E., & Wilhelm, S. (2011). The epidemiology of the proposed DSM-5 hoarding disorder: Exploration of the acquisition specifier, associated features, and distress. *Journal of Clinical Psychiatry, 72*(6), 780-786. doi:10.4088/JCP.10m06380

Timpano, K. R., Shaw, A. M., Cougle, J. R., & Fitch, K. E. (2014). A multifaceted assessment of emotional tolerance and intensity in hoarding. *Behavior Therapy, 45*, 690-699. doi:10.1016/j.beth.2014.04.002

Tolin, D. F., Frost, R. O., & Steketee, G. (2007). An open trial of cognitive-behavioral therapy for compulsive hoarding. *Behaviour Research and Therapy, 45*(7), 1461-1470. doi:10.1016/j.brat.2007.01.001

Tolin, D. F., Frost, R. O., Steketee, G., & Fitch, K. E. (2008). Family burden of compulsive hoarding: Results of an internet survey. *Behaviour Research and Therapy, 46*(3), 334-344. doi:10.1016/j.brat.2007.12.008

Tolin, D. F., Frost, R. O., Steketee, G., Gray, K. D., & Fitch, K. E. (2008). The economic and social burden of compulsive hoarding. *Psychiatry Research, 160*(2), 200-211. doi:10.1016/j.psychres.2007.08.008

Tolin, D. F., Frost, R. O., Steketee, G., & Muroff, J. (2015). Cognitive behavioral therapy for hoarding disorder: A meta-analysis. *Depression and Anxiety, 32*(3), 158-166. doi:10.1002/da.22327

Tolin, D. F., Kiehl, K. A., Worhunsky, P., Book, G. A., & Maltby, N. (2009). An exploratory study of the neural mechanisms of decision making in compulsive hoarding. *Psychological Medicine, 39*(2), 325-336. doi:10.1017/S0033291708003371

Tolin, D. F., Meunier, S. A., Frost, R. O., & Steketee, G. (2010). Course of compulsive hoarding and its relationship to life events. *Depression and Anxiety, 27*, 829-838. doi:10.1002/da.20684

Tolin, D. F., & Villavicencio, A. (2011). Inattention, but not OCD, predicts the core features of hoarding disorder. *Behaviour Research and Therapy, 49*, 120-125. doi:10.1016/j.brat.2010.12.002

Twohig, M. P., Hayes, S. C., & Masuda, A. (2006). Increasing willingness to experience obsessions: acceptance and commitment therapy as a treatment for obsessive-compulsive disorder. *Behavior Therapy, 37*(1), 3-13. doi:10.1016/j.beth.2005.02.001

Twohig, M. P., Hayes, S. C., Plumb, J. C., Pruitt, L. D., Collins, A. B., Hazlett-Stevens, H., & Woidneck, M. R. (2010). A randomized clinical trial of acceptance and commitment therapy versus progressive relaxation training for obsessive-compulsive disorder. *Journal of Consulting and Clinical Psychology, 78*(5), 705-716. doi:10.1037/a0020508

Twohig, M. P., Plumb Vilardaga, J. C., Levin, M. E., & Hayes, S. C. (2015). Changes in psychological flexibility during acceptance and commitment therapy for obsessive compulsive disorder. *Journal of Contextual Behavioral Science, 4*(3), 196-202. doi:10.1016/j.jcbs.2015.07.001

Wheaton, M. G., Abramowitz, J. S., Franklin, J. C., Berman, N. C., & Fabricant, L. E. (2011). Experiential avoidance and saving cognitions in the prediction of hoarding symptoms. *Cognitive Therapy and Research, 35*(6), 511-516. doi:10.1007/s10608-010-9338-7

Wheaton, M. G., Fabricant, L. E., Berman, N. C., & Abramowitz, J. S. (2013). Experiential avoidance in individuals with hoarding disorder. *Cognitive Therapy and Research, 37*(4), 779-785. doi:10.1007/s10608-012-9511-2

Wickham, H. (2017). *tidyverse: Easily install and load 'Tidyverse' packages* (R package version 1.2.1). Retrieved from https://CRAN.R-project.org/package=tidyverse

Wincze, J. P., Steketee, G., & Frost, R. O. (2007). Categorization in compulsive hoarding. *Behaviour Research and Therapy, 45*, 63-72. doi:0.1016/j.brat. 2006.01.012

Worden, B. L., Bowe, W. M., & Tolin, D. F. (2017). An open trial of cognitive behavioral therapy with contingency management for hoarding disorder. *Journal of Obsessive-Compulsive and Related Disorders, 12*, 78-86. doi:10.1016/j.jocrd. 2016.12.005

APPENDICES

Appendix A

Measures

Saving Inventory-Revised

For each question below, circle the number that corresponds most closely to your experience **DURING THE PAST WEEK.**

0	1	2	3	4
None	A little	A moderate amount	Most/ Much	Almost All/ Complete

1. How much of the living area in your home is cluttered with possessions? (Consider the amount of clutter in your kitchen, living room, dining room, hallways, bedrooms, bathrooms, or other rooms).	0	1	2	3	4
2. How much control do you have over your urges to acquire possessions?	0	1	2	3	4
3. How much of your home does clutter prevent you from using?	0	1	2	3	4
4. How much control do you have over your urges to save possessions?	0	1	2	3	4
5. How much of your home is difficult to walk through because of clutter?	0	1	2	3	4

For each question below, circle the number that corresponds most closely to your experience **DURING THE PAST WEEK.**

0	1	2	3	4
Not at all	Mild	Moderate	Considerable/ Severe	Extreme

6. To what extent do you have difficulty throwing things away?	0	1	2	3	4
7. How distressing do you find the task of throwing things away?	0	1	2	3	4
8. To what extent do you have so many things that your room(s) are cluttered?	0	1	2	3	4
9. How distressed or uncomfortable would you feel if you could not acquire something you wanted?	0	1	2	3	4
10. How much does clutter in your home interfere with your social, work or everyday functioning? Think about things that you don't do because of clutter.	0	1	2	3	4
11. How strong is your urge to buy or acquire free things for which you have no immediate use?	0	1	2	3	4

DURING THE PAST WEEK:

0	1	2	3	4
Not at all	Mild	Moderate	Considerable/ Severe	Extreme

12. To what extent does clutter in your home cause you distress?	0	1	2	3	4
13. How strong is your urge to save something you know you may never use?	0	1	2	3	4
14. How upset or distressed do you feel about your acquiring habits?	0	1	2	3	4
15. To what extent do you feel unable to control the clutter in your home?	0	1	2	3	4
16. To what extent has your saving or compulsive buying resulted in financial difficulties for you?	0	1	2	3	4

For each question below, circle the number that corresponds most closely to your experience **DURING THE PAST WEEK.**

0	1	2	3	4
Never	Rarely	Sometimes/Occasionally	Frequently/ Often	Very Often

17. How often do you avoid trying to discard possessions because it is too stressful or time consuming?	0	1	2	3	4
18. How often do you feel compelled to acquire something you see? e.g., when shopping or offered free things?	0	1	2	3	4
19. How often do you decide to keep things you do not need and have little space for?	0	1	2	3	4
20. How frequently does clutter in your home prevent you from inviting people to visit?	0	1	2	3	4
21. How often do you actually buy (or acquire for free) things for which you have no immediate use or need?	0	1	2	3	4
22. To what extent does the clutter in your home prevent you from using parts of your home for their intended purpose? For example, cooking, using furniture, washing dishes, cleaning, etc.	0	1	2	3	4
23. How often are you unable to discard a possession you would like to get rid of?	0	1	2	3	4

Saving Cognitions Inventory

Use the following scale to indicate the extent to which you had each thought when you were deciding whether to throw something away **DURING THE PAST WEEK**. (If you did not try to discard anything in the past week, indicate how you would have felt if you had tried to discard.)

1 2 3 4 5 6 7

not at all sometimes very much

1.	I could not tolerate it if I were to get rid of this.	1 2 3 4 5 6 7
2.	Throwing this away means wasting a valuable opportunity.	1 2 3 4 5 6 7
3.	Throwing away this possession is like throwing away a part of me.	1 2 3 4 5 6 7
4.	Saving this means I don't' have to rely on my memory.	1 2 3 4 5 6 7
5.	It upsets me when someone throws something of mine away without my permission.	1 2 3 4 5 6 7
6.	Losing this possession is like losing a friend.	1 2 3 4 5 6 7
7.	If someone touches or uses this, I will lose it or lose track of it.	1 2 3 4 5 6 7
8.	Throwing some things away would feel like abandoning a loved one.	1 2 3 4 5 6 7
9.	Throwing this away means losing a part of my life.	1 2 3 4 5 6 7
10.	I see my belongings as extensions of myself; they are part of who I am.	1 2 3 4 5 6 7
11.	I am responsible for the well-being of this possession	1 2 3 4 5 6 7
12.	If this possession may be of use to someone else, I am responsible for saving it for them.	1 2 3 4 5 6 7
13.	This possession is equivalent to the feelings I associate with it.	1 2 3 4 5 6 7
14.	My memory is so bad I must leave this in sight or I'll forget about it.	1 2 3 4 5 6 7
15.	I am responsible for finding a use for this possession.	1 2 3 4 5 6 7
16.	Throwing some things away would feel like part of me is dying.	1 2 3 4 5 6 7
17.	If I put this into a filing system, I'll forget about it completely.	1 2 3 4 5 6 7
18	I like to maintain sole control over my things.	1 2 3 4 5 6 7
19.	I'm ashamed when I don't have something like this when I need it.	1 2 3 4 5 6 7
20.	I must remember something about this, and I can't if I throw this away.	1 2 3 4 5 6 7
21.	If I discard this without extracting all the important information from it, I will lose something.	1 2 3 4 5 6 7
22.	This possession provides me with emotional comfort.	1 2 3 4 5 6 7
23.	I love some of my belongings the way I love some people.	1 2 3 4 5 6 7
24.	No one has the right to touch my possessions.	1 2 3 4 5 6 7

AAQ-II

Below you will find a list of statements. Please rate how true each statement is for you by circling a number next to it. Use the scale below to make your choice.

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

1.	My painful experiences and memories make it difficult for me to live a life that I would value.	1	2	3	4	5	6	7
2.	I'm afraid of my feelings.	1	2	3	4	5	6	7
3.	I worry about not being able to control my worries and feelings.	1	2	3	4	5	6	7
4.	My painful memories prevent me from having a fulfilling life.	1	2	3	4	5	6	7
5.	Emotions cause problems in my life.	1	2	3	4	5	6	7
6.	It seems like most people are handling their lives better than I am.	1	2	3	4	5	6	7
7.	Worries get in the way of my success.	1	2	3	4	5	6	7

Homework Completion

1. How much of the homework did you complete over the past week?

1	2	3	4	5
0%	25%	50%	75%	100%

2. How much effort did you put into achieving the goal you set for yourself?

1	2	3	4	5
0%	25%	50%	75%	100%

Appendix B

Acceptance-Based Training Protocol

Acceptance-Based Training for Hoarding

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2012). *Acceptance and commitment therapy: The process and practice of mindful change* (2nd ed.). New York, NY: The Guilford Press.

Morrison, K. L. (2010). *Brief acceptance and commitment therapy training for impulsivity*.

Twohig, M. P. (2004). *ACT for OCD: Abbreviated treatment manual*.

This protocol outlines the structure of a brief (75 minutes) acceptance-based training for hoarding in college students. It describes the main components of this one-session intervention, including scripted examples for guidance. Therapists using this manual need not use the exact same wording or give equal emphasis on the various components across clients. Rather, therapists should use their experience with and understanding of ACT to approach therapy flexibly according to the client's presentation and needs.

Informed Consent

The therapist needs to explain to clients what the acceptance-based session entails as well as obtain their informed consent. During this process, the therapist should highlight the possibility that clients may experience emotional discomfort. This section serves as an orientation to the session and sets the tone for what is to follow.

> Therapist: Thank you for coming in today. You are here because your scores on a questionnaire you completed previously suggested that you might be having some difficulty managing your saving behavior. For the next 60 to 90 minutes, I'd like us to talk about this behavior, including ways in which it may be impacting your life. At the end of our session, I would like you to apply whatever you have learned to the discarding task. In addition, because we will also be talking about internal experiences, such as thoughts and feelings, that accompany this behavior, some parts of this session may be distressing. This doesn't necessarily mean it will be overwhelming, but I'd like you to be prepared to let show up whatever comes up. Do you have any questions before we begin?

Assessment of the Problem

Once the client is aware of what the session involves, the therapist should try to understand the client's presenting problem. This may begin with a broad description of the problem, but for the purpose of this brief session, the therapist and client should select a particular operationalizable behavior on which to focus (e.g., difficulty discarding, excessive acquiring).

> Therapist: Earlier, I mentioned that we'll be talking about your saving behavior today. Could you tell me more about it? Which aspect do you find especially concerning or troubling?

Before moving on, the therapist should ensure that a specific behavior has been identified in order to facilitate the remainder of the session. The therapist can also begin to draw links between the discarding task and the participant's real-life struggles with saving/discarding. In addition, the therapist and client can explore antecedents and consequences of the behavior, including any thoughts, emotions, and bodily sensations. For example, the client may report intense discomfort prior to discarding attempts or going on a buying spree when feeling upset.

> Therapist: How long have you experienced these difficulties? Can you think of situations that precede or seem to cause the behavior? What happens after you engage in the behavior? What are some other things you experience along with the behavior? This may include thoughts, feelings, and even bodily sensations. How has this behavior affected your life?

Creative Hopelessness

Now that the therapist has established the target behavior of the session, she can move on to identifying strategies the client has used to avoid, escape, or decrease any associated unwanted psychological experiences (e.g., intense discomfort, thoughts that she is losing a part of herself by discarding). This may involve a brief listing activity. Besides saving, strategies may include avoidance of decision making, rationalizing, and reassurance seeking. As the client enumerates the various strategies, the therapist should ask the client about the effectiveness of each one, particularly with respect to the duration of their effectiveness.

The goal of this section is to help the client come into contact with the effectiveness of the methods she has been using. It is important during this stage to encourage the client to evaluate the strategies based on her experience, not based on what her mind says or what logic dictates. The therapist should note that her role in this exercise is to work with the client to figure out how previous strategies have worked based on her experience, not simply to conclude that nothing has worked.

> Therapist: Besides saving, what are some other things you do to avoid or decrease that e.g., thought (or any other internal experience)? When you do those things, what do you notice happens to the thought? Does it become bigger or smaller? What happens to the thought after a while? Does it stay bigger/smaller? [Usually, the client will report that these strategies only work in the short term. If they worked in the long term, the client would not currently be experiencing difficulties.] So it seems like these strategies do work for a while, but they seem less effective in helping you deal with this thought in the long run. Does that seem like an accurate assessment based on your experience?

Control as the Problem

At this point, the client should have realized that her strategies have been unsuccessful in reducing or getting rid of unwanted internal experiences. A follow-up step is to get the client to see that attempts to control internal experiences in fact have the

paradoxical effect of increasing their strength and/or frequency.

> Therapist: It seems like the things you've been doing to avoid or reduce these internal experiences haven't been working how you want them to or how your mind says they will. In some ways, these methods may have even been making those internal experiences bigger, rather than smaller. This is not to say that our minds are bad. In fact, our minds work brilliantly most of the time. We use them to solve problems, to invent, to carry out daily activities. When we need to eat, we get food. When we don't like a painting, we can remove it from the room. But maybe, when it comes to the internal world, the mind doesn't work as well. What do you think about that? Let's do a quick exercise. Imagine that you are **hooked up to a polygraph**. It's the most sensitive polygraph in the word and will detect even the slightest bit of increase in anxiety. All you need to do is relax, and I will give you $10,000. Easy, right? The only catch is you have to do so while singing the national anthem at a football game in front of a fully packed stadium, which will be televised live across the country. Do you think you can do it? Why not? So perhaps, unlike an ugly painting, we can't just remove feelings of anxiety. In fact, don't you find that the harder you try to control your anxiety, the more it shows up? It's almost like, if you aren't willing to have it, you've got it.

Acceptance/Willingness

Now the therapist can introduce acceptance as an alternative strategy to control for responding to unwanted internal experiences. However, it may be helpful to use the term "willingness" rather than "acceptance" with the client, as "acceptance" sometimes carries the connotation of tolerance or resignation. Within ACT, acceptance indicates taking an active, welcoming stance toward and embracing once avoided internal experiences.

Throughout the session, the therapist may choose to focus on the behavior of discarding to prepare participants for the study task that follows as well as to orient their attention to a discrete behavior. This could mean using the discarding task as an example over the course of the session, as the therapist covers the different ACT processes.

> Therapist: Let's look at the "Accepting" row. It talks about acknowledging your internal struggles, without trying to control them. Another way of talking about this is being willing to have these experiences as they are, without trying to avoid them or get rid of them or run away from them. It's kind of like you're **driving a bus full of passengers**. These passengers represent your internal experiences: your thoughts, feelings, sensations, etc. Some of these passengers are nice; they greet you when they step on the bus, and they sit quietly in their seats during the journey. But some of the passengers are rather difficult. They threaten you and tell you where you should be steering the bus. So what do you do? Maybe you try to get them off the bus. But notice that if you do that, the bus isn't moving. What else could you do? You could make a deal with them, and say, "Fine, I'll go where you want me to go. Just sit down at the back and keep quiet." Notice now

that you have essentially lost control of the bus, even though the bus is moving. You're no longer the one deciding the direction of the bus. So what else could you do? We know that these passengers are pretty stubborn – that's what your experience tells you. They're going to stay on the bus whether you like it or not. Maybe even more so because you don't like them. They don't just leave when you say "Get off!" Perhaps, instead of fighting or making deals with them, we could try a different way of interacting with them. What if you were to simply acknowledge that those difficult passengers are there, and be willing to have them on your bus without stopping or being controlled by them? How might that look like?

Defusion/Contact with the Present Moment

Defusion is inextricably tied to acceptance, so the distinction here is entirely arbitrary. The therapist may notice defusion work starting before this section, particularly when discussing the passengers on the bus metaphor, and that is fine. Here, the therapist will focus more explicitly on reducing the literality of the meaning of thoughts, which will help with acceptance. Some present moment awareness work can be initiated at this time as well. The therapist should remember to link the processes back to the discarding task.

Therapist: Now we'll look at the "Noticing" and "Here Now" rows. The idea here is to simply notice thoughts or other internal experiences, without buying into them, as they occur in the present moment. This means experiencing thoughts as thoughts, feelings as feelings, and sensations as sensations. Nothing more, and nothing less. I want you to think, "I cannot raise my right hand." Now raise your right hand. Notice how your thoughts are disconnected from your actions. You can choose to act in ways that are important to you, regardless of what your mind says. Your thoughts do not have to control your behavior. Another way of thinking about it is: noticing means looking at the thought [gesture distance between perspective and thought], whereas buying into the thought means looking from the thought [gesture closeness between perspective and thought]. What is a thought that you have been struggling with? How does the thought look like? [Get the client to describe various physical properties of the thought e.g., size, color, shape, speed, name]. Have you been looking from the thought or at the thought? Let's say this thought is a passenger on the bus. It's a particularly difficult passenger. Can you describe what it likes to do when you're driving? What has your reaction been? Now, does it really have the ability to do anything to you if you don't listen to it? What if the passenger is more like a hologram? You can look at it, it has all these perceptible characteristics, and it feels real, but at the end of the day, what if it is just a hologram, a thought, a product of your mind? How is the passenger now? Do you think you can continue driving the bus without giving in to its threats? At the same time, notice that when you allow the passenger to distract you from driving, it is taking your attention away from the here and now. Perhaps you're thinking about the next junction when the passenger might come to the front of the bus and start threatening you again, or you're regretting that time you turned left because of the passenger's yelling when you really

wanted to turn right. During all this, notice that you're not focusing on the road in front of you, or on what you are doing in the present moment.

Self as Context

Depending on which thoughts are most distressing to the client, the therapist may give more or less emphasis to this section. For instance, if identity seems to be a prominent concern, particularly with regard to fusion of personal identity with ownership of possessions, spending more time on self as context may be useful. People who hoard sometimes view their possessions as extensions of the self or essential to their identity, making letting go of objects particularly difficult.

> Therapist: As we start on the "I Am" row, could you share with me a few "I am" statements? How have these thoughts been helpful or unhelpful? Notice that these "I am" thoughts that you have are not different from the thoughts we discussed earlier. They're just more passengers on the bus, more holograms, more products of your mind. We can try another exercise to make the idea more concrete. I'd like you to **hold this pen** [give client a pen]. Now you have the pen, correct? Are you now the pen? Why not? Right, holding something doesn't make you the thing. So just as you have the pen, you have all these thoughts. But are you those thoughts? Do the thoughts change who you are? You are where the thoughts occur. Also notice that it doesn't matter if you clench the pen or if you just hold it lightly in your hand. The pen is still in your hand, and you are still holding it. However, which one requires more energy?

Values

Values are things that are important to the client (e.g., family, academics, spirituality), and motivate her to engage in adaptive behaviors in the face of internal struggles. It is the answer to "Why should I do all these difficult things?" It is also the standard against which utility of the client's behaviors is evaluated. Behaviors that bring clients closer to their values are useful, and behaviors that derail clients are not. It is helpful to distinguish between values, which can never be wholly achieved (e.g., being a loving parent), and concrete goals, which can be marked off a checklist (e.g., reading to my child for an hour before bed). The therapist should work with the client to clarify values, which will help her follow through with the ACT processes after the session. At this stage, the therapist can help the client see that their decision in the subsequent discarding task is linked to their values.

> Therapist: All these things we've just talked about can be hard. It is not easy to continue driving your bus in the direction you want to go with all these scary passengers less than a few feet away who keep telling you to go a different way. So it seems to me like that direction in which you're taking the bus must be pretty important to you. If not, it wouldn't be worth making room for these difficult passengers. You could just stop the bus and spend all your time trying to chase them off the bus. The directions in which you want to go match up with what the

worksheet calls "personal values." They are the motivation behind your chosen actions. Values are not really attainable in a concrete sense, unlike goals. It's like traveling west. You cannot be at west; you can always be more west. A goal is more like going to California. You can be in California, and you can achieve that goal. With this distinction in mind, can you tell me more about your values or the directions that matter to you? [After the client has understood the concept of values, work with her on the first two pages of the ACT homework]. Now, looking at your values, is it worth having all these passengers with you on the bus as you move closer to them? Notice that this is entirely your choice. You can choose to pursue your values and keep the bus going west, or you can choose to cede control to your thoughts and head east. You get to choose how you want your life to go.

Committed Action

Once values have been clarified, the therapist can work with the client to identify behavioral goals in service of those values. Until this point, the therapist has focused on increasing the client's willingness to experience difficult thoughts and feelings, but now the objective is to increase behavioral engagement that will bring the client closer to valued living. The therapist can point out that a first step toward valued living shows up in the discarding task that follows. The strategy for addressing overt behaviors is different because unlike internal events, they can be controlled. The therapist and client should work together to come up with specific behavioral goals consistent with the latter's values and select one for the client to work on over the next week.

Therapist: This is the last section of the worksheet – the to-do list, for things you can do that will move you closer to your values. We know that trying to control our internal struggles doesn't work. But what is it that we can control? Our behavior. I can raise my hand if I want to. I can cross my legs. I can choose to do my homework tonight because that will help me do well in school, and school is important to me. Committing to certain behaviors is like **wading through a swamp** to get to the other end where there are things you care about. As you do it, you may experience a whole bunch of difficult internal experiences – you could think, "I will die here," you may feel frustrated – but you are engaging in behavior that will bring you closer to your values. Looking at the values you have identified, can you come up with some actions you can engage in that are consistent with those values? What about the discarding task we are going to do in a few minutes? Where does that fit in? Now, select one behavioral goal that you could realistically accomplish over the next week, and write it down in the homework sheet). Over the next week, if you are willing, I'd like you to continue practicing what we have covered in today's session. For example, when you experience a difficult thought or an unpleasant emotion, ask yourself whether it is just another passenger on the bus, and if it is worth changing directions to keep it quiet. Remember that while we cannot choose what to think or feel, we can choose how to react to those experiences. We can choose to let our thoughts

control us, or we can choose to continue moving toward the things we care about.

Homework

In the last part of the session, the therapist should spend a few minutes explaining the homework assignment to the client and answer any remaining questions.

> Therapist: We've completed about half of this homework together, and the remaining sections are pretty straightforward. Under "Goal Setting," I'd like you to spend some time thinking about why you chose this goal and how it is personally meaningful to you or how it links to your values. Remember that values provide purpose to our chosen actions. In the next section, "Being Willing," list some of the difficult thoughts, feelings, sensations, and urges you think you might struggle with over the next week, as you work on this goal. The final portion aims to help you achieve your goal by breaking it down into smaller, more manageable steps. Feel free to use the worksheet however you think it will best help you achieve your goal. You can update it over the week, as you experience new difficult thoughts, or you can leave it in a visible place so you can remind yourself why what you are doing is important. The homework is meant to help you engage in actions that bring you closer to your values. At the end of the week, take a look at the worksheet and see if you achieved what you set out to do. Also notice how this alternative to what you usually do might have differentially affected your life.

Appendix C

Acceptance-Based Training Homework

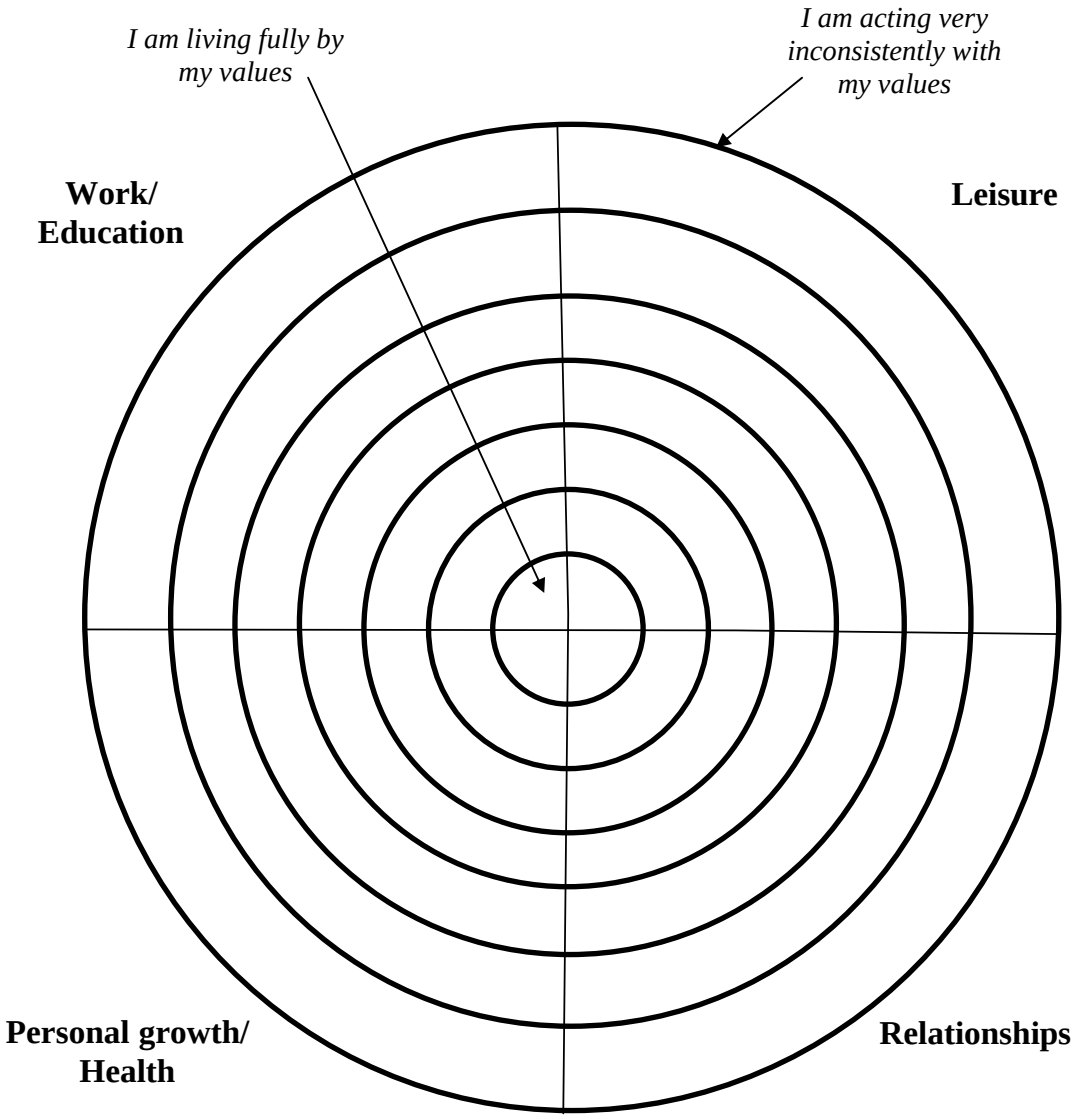
YOUR VALUES: *What really matters to you, deep in your heart? What do you want to do with your time on this planet? What sort of person do you want to be?* You can think about your values along four dimensions:

1. **Work/education** (e.g., career, school)
2. **Relationships** (e.g., family, partner, friends, roommates)
3. **Personal growth/health** (e.g., sense of identity, thriftiness, knowledge, environmental responsibility, comfortable living)
4. **Leisure** (activities for rest, recreation, and fun; e.g., hosting, personal space for relaxation)

Think about some things that are important to you, but that you have been unable to move closer to because of your saving behavior. For example, family might be a value you hold, but there might be tension between you and your family members because of your excessive saving. In this instance, choosing to engage in your saving behavior rather than give in to your family members is a chosen action that moves you further away from your values. What are some things that are important enough to you that will make the decision to discard worth it? What is worth your wading through the swamp? Please fill in the table below with some values that come to mind. Remember that values are different from concrete, achievable goals. For example, your *goal* might be to spend time with your relatives without arguing over your belongings, but this goal reflects your *value* of family.

Work/education	
Relationships	
Personal growth/health	
Leisure	

THE BULL'S EYE: Think about the ways that your saving behavior has impacted your life. It could be that time you spent money on a new item when you didn't actually need it or had the funds for it. It could be the time your friends wanted to hang out at your place, and you had to make excuses because it was too messy and you were embarrassed. Consider the ways in which your life would be different if you didn't have to save. How would your life look like if you woke up one day and you no longer had the urge to save or had difficulty discarding? Now, think about where you are now, relative to that day. Make an X in each area of the dartboard to represent where you stand today.



Take a look at where your X is and compare that to where you would like your X to be. How can we get the X to move closer to where you want it to be? One way to move closer to our values is to ***set goals guided by our values***.

GOAL SETTING: From the list of behavioral goals we identified in session, select one specific goal you can realistically accomplish over the next week. It should be personally meaningful or important to you (not just something you think would please other people) and move you in the direction of your values. For example, if the time you spent trying to discard was distracting you from your schoolwork and affecting your academic performance, a goal you could work on is limiting the time spent on discarding. You might also value thriftiness, but your urge to acquire has made it difficult for you to stick to your budget. In this case, a goal could be to limit spending on unnecessary items to $5 a week. Notice that your goals are defined by your values, so keep your values in mind when selecting a goal for the next week.

My goal over the next week is to:	
The values underlying my goal are:	
The actions I will take to achieve that goal are:	

BEING WILLING: We talked about how acting in values-consistent ways can be difficult because of certain thoughts, feelings, sensations, or urges, and we discussed the idea of making room for these thoughts, feelings, sensations, or urges, while doing what we care about. Thus, I would like you to write down internal experiences that you are willing to make room for in order to achieve your specific goal that will move you closer to your values. These experiences may include feelings of discomfort, sadness when losing items, and thoughts that you are wasteful.

Thoughts/memories	
Feelings	
Sensations	
Urges	

Finally, let's note a few other things that may help you to meet your goal.

It would be useful to remind myself that:	
I can break this goal down into these smaller steps:	
The smallest, easiest step for me to begin with is:	
The time and day I will take that first step is:	

Appendix D

Psychoeducation Protocol

Psychoeducation for Hoarding

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Association.

This protocol outlines the structure of a brief (75 minutes) psychoeducation session for hoarding in college students. It describes the main components of a one-session intervention, including scripted examples for guidance. Therapists using this manual need not use the exact same wording or give equal emphasis on the various components across clients. The therapist should have a computer with the *Hoarding: Buried Alive* video set up prior to the session.

Informed Consent

The therapist needs to explain to clients what the psychoeducation session entails as well as obtain their informed consent. During this process, the therapist should highlight the possibility that clients may experience emotional discomfort, although it is unlikely. This section serves as an orientation to the session and sets the tone for what is to follow. The therapist should take care to keep the session as interactive as possible, such that the client feels engaged with the material and is subject to similar demand characteristics as the acceptance-based training. This may involve asking questions about content or the client's thoughts and reactions.

> Therapist: Thank you for coming in today. You are here because your scores on a questionnaire you completed previously suggested that you might be having some difficulty managing your saving behavior. For the next 60 to 90 minutes, I'd like us to have an interactive discussion about this saving behavior. We can talk about your personal experiences, but my main goal is to help you understand a bit more about what the research says about such saving behavior. Because we might be touch on some of your personal experiences, please note that parts of this session may be distressing. However, you only need to share as much as you feel comfortable sharing. The focus of the session is more on helping you understand the nature of saving. Do you have any questions before we begin?

Assessment of the Problem

Once the client is aware of what the session involves, the therapist should try to briefly understand the client's presenting problem in order to make the components of the session more relevant to her. It is important to note that the focus of the session is not on the client's hoarding per se, but more on hoarding in general within a cognitive-behavioral model.

> Therapist: Earlier, I mentioned that we'll be talking about your saving behavior today. Could you tell me more about it? Which aspect do you find especially concerning or troubling? How long have you experienced these difficulties? What other things tied to the behavior have been difficult for you?

Hoarding as a DSM-5 Disorder

Because the psychoeducation intervention centers on hoarding disorder, rather than nonclinical hoarding, the therapist should be wary about making unwarranted generalizations to the client. Instead, the therapist should show awareness of differences between the content discussed in session and the client's own hoarding, based on the latter's report in the previous section. As an introduction, the therapist will cover the history of hoarding disorder—how it came to be included in the *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition* (DSM-5)—and the DSM-5 definition of hoarding disorder.

> Therapist: As I mentioned earlier, in this session, we'll be talking about saving behavior. There are many terms for it, but the term psychologists generally use is "hoarding." Hoarding is not a new behavior. Hoarding is observed in the animal kingdom, and we know of hoarding cases occurring as early as the 1940s. However, research on hoarding only increased in recent years, and before the 1990s not much was known as hoarding in humans. Part of the reason for this increase in scientific attention was the push to include and eventual inclusion of hoarding as a mental disorder in the *Diagnostic and Statistical Manual of Mental Disorders* or DSM-5, which is a handbook of psychological conditions. The DSM-5 calls it "hoarding disorder." Like most behaviors, hoarding is dimensional, which means that it varies in intensity across people. So even though it is listed in the DSM-5, this doesn't mean that you or anyone else with certain saving behaviors has a mental condition. How do you understand this dimensional quality of hoarding? What are your thoughts about it? How do you think your saving behavior fits on this scale of hoarding? What do you think hoarding disorder might look like?

The therapist should try to ask the client open-ended questions that require thinking and engagement, rather than closed questions that stymie the conversation.

> Therapist: The DSM-5 requires that the individual has persistent difficulty discarding or parting with possessions, and that the clutter that accumulates as a result prevents living spaces from being used in their intended ways (American Psychiatric Association, 2013). Also, the hoarding should lead to significantly distress and/or impairment in functioning. Hoarding may or may not be accompanied by excessive acquisition in which the person keeps acquiring things that are not needed or for which she has no space. How do you think your own saving compares to this description? Can you think of ways that such behavior might be problematic for people?

Case Example of Hoarding

This section comprises the bulk of the session. Clients are asked to watch a full episode of *Hoarders* to expose them to a real-life example of significant hoarding.

> Therapist: Now, we're going to watch an episode of *Hoarders* to give you a sense of what saving behavior can look like when it gets out of hand. After the episode, we'll discuss your thoughts about and reactions to the episode.

After watching the video, the therapist will engage in a discussion with the client about the episode, guided by the discussion questions provided below.

1. What did you see in the video?
2. What are some thoughts and reactions you had to the video? Why?
3. Why do you think they are doing this behavior? Why do you think it's difficult for them to stop doing the behavior?
4. How do you think their hoarding is impacting their life? What are some good and bad consequences associated with the behavior?
5. What did you think about the way they dealt with hoarding in the episode?
6. What do you think happened after the episode was filmed?
7. How do you feel about your own saving behavior after watching the video?

Homework

In the last part of the session, the therapist should spend a few minutes explaining the homework assignment to the client and answer any remaining questions.

> Therapist: Over the next week, if you are willing, I'd like you to complete this self-monitoring form to track your saving and discarding behavior. Specifically, let's focus on times when you save things you would like to, plan to, or feel that you should discard, as well as when you discard those things. As part of self-monitoring, you will need to note how often it occurs during the day. It would be best to keep the form with you at all times, and to mark a tally immediately after the behavior occurs. At the end of the week, note how the frequency of the behaviors has changed or not changed over time.

Appendix E

Psychoeducation Homework

SELF-MONITORING: Self-monitoring involves systematically observing and recording specified target behaviors. For the next week, I would like you to use the worksheet below to track your saving and discarding behavior.

Please note the frequency of your saving and discarding behavior over the following week starting from tomorrow. Please keep this form with you at all times and mark the tally as soon as possible after the behavior.

	Saved something I wanted to, planned to, or should discard	Discarded something I wanted to, planned to, or should discard
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		
Sunday		