

An Attachment-Based Model of Compulsive Hoarding

By: Kimberly J. Nozick

A Thesis submitted to the Faculty of Graduate Studies at
The University of Manitoba in partial fulfillment of the requirements of the degree of
Master of Arts

Department of Psychology

University of Manitoba

Winnipeg, Canada

Copyright © 2016 by Kimberly J. Nozick

Abstract

Compulsive hoarding refers to the excessive acquisition of possessions, difficulty in discarding items, and the accumulation of clutter (Frost & Hartl, 1996). Since hoarding involves strong emotional attachments to objects, hoarding may be conceptualized as an attachment-related disorder. According to attachment theory (Bowlby, 1969), insecure attachment to others can occur when close relationships do not provide a sense of safety and security. This study explores a mediational model, whereby insecure attachment influences hoarding through the joint effect of relationship satisfaction, attachment to objects, and saving cognitions. A large community sample of adults ($N = 1341$) completed online measures. Assessment of the mediational model used an ordinary least-squares analytic framework to estimate direct and indirect effects, and bootstrap methods to obtain confidence intervals. Results provide support for the proposed mediational model. Similarities and differences between insecure attachment styles are discussed, as well as clinical implications for the treatment of hoarding.

Acknowledgements

Sincere thanks to my amazingly patient, kind, and brilliant advisor, Dr. Edward A. Johnson, for his generous gift of expertise, time and every kind of support a graduate student needs - throughout the duration of this MA thesis! As well, thank you to my committee members, Dr. Jessica Cameron and Dr. Laine Torgrud, for their patience, understanding, encouragement and scholarly contributions to my research.

Funding for this research was provided by a Social Sciences and Humanities Research Council (SSHRC) Scholarship: *The Joseph-Armand Bombardier Canada Graduate Scholarships Program: Master's Scholarship.*

Family and Friends: The support of my family and friends made it possible for me to persist with this goal and succeed!!!! Thank you Mom, Dad, Cheryl, Jenn, Josh, Ali, Madeline, Brianna, Emily, Scarlett, and of course Roxy!!!

A special thank you to those of you who I may not have gotten through this without: Drs. Doug & Darlene Tataryn, Dr. Ian Clara, Rob McNamara, Joanna Bhaskaran, Karen O'Brien, Damien Dowd, Tracy DeBoer, Megan Vincent, Jennifer Robinson, Heather Simister, Jen Star, Pam, Sheila, and Bev Bahans, and Roselle Aquino. A very special thank you to both Sheena Grobb and Trevor Sie. Tyler Spencer...I will be forever grateful for all the time you volunteered in helping me with idea generation.

Dr. Kelli Berzuk...There really are no words. You are an amazing person and friend. Thank you for being such a terrific role model for me.

Table of Contents

Abstract.....	i
Acknowledgements	ii
Table of Contents	iii
List of Tables.....	v
List of Figures.....	vi
Chapter 1: Introduction.....	1
Chapter 2: Current Study.....	23
Chapter 3: Method.....	27
Chapter 4: Statistical Analyses	36
Chapter 5: Results.....	37
Chapter 5: Discussion.....	51
Chapter 7: Conclusion.....	57
References	60
Appendix A: Saving Inventory-Revised (SI-R)	76
Appendix B: Saving Cognitions Inventory (SCI)	79
Appendix C: Relationship Assessment Scale- Modified (RAS-M)	81
Appendix D: Experiences in Close Relationships Questionnaire (ECR).....	85
Appendix E: Attachment to Objects Scale (ATO)	88
Appendix F: Demographic Questionnaire.....	89
Appendix G: Research Ethics Approval Documentation.....	91

Table of Contents (Continued)

Appendix H: Research Ethics Amendment Approval	92
Appendix I: Information and Consent Form 1	93
Appendix J: mTurk Recruitment Script.....	96
Appendix K: Information and Consent Form 2	97

List of Tables

Table 1: Summary of Means and Standard Deviations for Study Variables	39
Table 2: Correlations (Pearson's r) between Study Variables	40
Table 3: Simple and Multiple Mediation Effects of Anxious Attachment on Hoarding through Relationship Satisfaction, Object Attachment, and Saving Cognitions.....	46
Table 4: Simple and Multiple Mediation Effects of Avoidant Attachment on Hoarding through Relationship Satisfaction, Object Attachment, and Saving Cognitions.....	47

List of Figures

Figure 1: Bartholomew's 4 Category Model.....	17
Figure 2: The Proposed Mediational Model.....	25
Figure 3: Anxious Attachment Style: Statistical Diagram of All Paths and Coefficients.....	41
Figure 4: Avoidant Attachment Style: Statistical Diagram of All Paths and Coefficients.....	42
Figure 5: Simple Slopes for Saving Cognitions.....	49
Figure 6: Simple Slopes for Attachment to Objects.....	50
Figure 7: Simple Slopes for Relationship Satisfaction.....	50

An Attachment-Based Model of Compulsive Hoarding

Compulsive hoarding is characterized by the excessive acquisition of goods in conjunction with great difficulties discarding them. The result is an accumulation of clutter, which ultimately limits the intended use of living spaces. When clutter becomes extensive, hoarders suffer distress and impairment in general functioning (Frost & Hartl, 1996). Though researchers have long been familiar with the problem, the reality TV show *Hoarders* has helped to inform the general population about the severity of compulsive hoarding (hereafter called hoarding). As such, questions regarding the nature of hoarding are on the rise. Only within the last 10-15 years have researchers begun to formulate models explicating factors that may underlie the development and maintenance of the disorder.

Hoarding disorder (HD) has only recently been included in the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5, 2013). One main requirement for diagnosis of HD is that the thought of parting with belongings causes substantial distress to the individual. Typically, items such as old clothing, newspapers, books, and other paperwork are saved for their subjective value, and hoarders keep them for their perceived utility, aesthetic value, sentimentality, and/or concerns over being wasteful. Difficulty in discarding results in the accumulation of clutter, which renders household areas unusable for their intended purposes. Moreover, decisions to discard and declutter lead to clinically significant levels of distress or impairment in social, occupational, or other important areas of functioning (including precautionary safety measures for self and others). Given the strong emotional attachment hoarders have to their belongings, this raises the question of whether hoarding might be an attachment-related disorder. This conceptualization forms the basis for the current research.

At present, there are two main conceptualizations of hoarding in the literature, neither

of which are attachment based. The site security model, which takes a biological and evolutionary perspective (Andersson & Krebs, 1978; Kellett, 2007; Honig, 1991; Kolb, 1974; Lanier, Estep, & Dewsbury, 1974), and the cognitive-behavioral model. The cognitive-behavioral model is the predominant model for hoarding in humans (Frost & Gross, 1993). Both models have made valuable and significant contributions to the understanding and conceptualization of hoarding behavior, and the cognitive-behavioral model in particular has advanced the assessment and treatment of humans with compulsive hoarding behaviors. However, one question left unanswered by both of the above mentioned models is where the fear of loss comes from, and/or where the underlying false cognitions and beliefs originated (i.e., how were their security schemas formed). What is driving the fear of “not having” when plenty of resources abound and there is no indication of imminent loss. On these issues, Bowlby’s theories of attachment and loss (1969) would appear to be relevant, yet are rarely considered or integrated into current conceptualizations of hoarding. Investigations of hoarding from an attachment perspective may explain underlying reasons for the attachment to possessions in hoarding, and whether or not attachments with objects generate the same feelings of security that generally come with secure attachments to people (Bowlby, 1969; Ainsworth et al., 1978).

Accordingly, the current study will examine the relationship between attachment to people and attachment to objects by testing a new model positing that hoarding behavior is the end result of the effect of insecure attachment on the quality of interpersonal relationships, compensatory object-oriented emotional regulation strategies, and hoarding cognitions.

Diagnosis and Treatment of Hoarding Disorder

The 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5,

2013) includes HD as a new and unique disorder within the family of obsessive-compulsive disorders and related disorders. Diagnostic criteria include: (a) persistent difficulties with discard of possessions, strong urges to save, and/or distress regarding discard; (b) an accumulation of clutter in living spaces preventing the normal use of those living spaces; (c) clinically significant distress or impairment; (d) hoarding symptoms not due to a general medical condition; and (e) the hoarding symptoms not being restricted to the symptoms of another mental disorder (DSM-5, American Psychiatric Association, 2013).

The DSM-5 criteria for HD also includes specifiers pertaining to 1) level of insight, and 2) excessive acquisition tendencies. Generally, individuals with HD report low levels of insight compared to individuals with OCD, and men and women seem to differ in patterns of excessive acquisition (Kress, Stargell, Zoldan, & Paylo, 2016). Although the DSM-IV did not formally include hoarding as a subtype of OCD, clinicians, in general, have been using OCD treatment protocols for HD. Unfortunately, the success rate of treatment remains low, at around 40% (Saxena & Maidment, 2004), and perhaps this is related to the finding that 83% of patients with primarily hoarding symptoms do not meet the criteria for OCD (Tolin, Meunier, Frost, & Steketee, 2011).

Hoarding is a serious problem. Although one may not immediately recognize the disorder as one with fatal consequences there have been numerous accounts of death and injury resulting from intolerable amounts of clutter and debris that interfere with health and safety. One of the first documented hoarding-related fatalities involved the death of two brothers living in New York (Associated Press, 1947) as a result of a collapsing tower of clutter and debris in their home, trapping one brother under massive loads and rendering him unable to feed his paraplegic brother who subsequently starved to death, a consequence of hoarding that Solomon

& Mataix-Cols (2014) refer to as a “clutter avalanche”. Hoarding is also associated with an increased risk of fire due to massive amounts of paper and flammable debris in the homes of hoarders and because the clutter can impede access to fire escapes and natural exits, and impede access of emergency responders to rescue persons inside. A 10-year longitudinal investigation by the Melbourne Fire Department of residential fires found that 24% of all preventable fire fatalities were related to hoarding, with the average costs of hoarding-related fires being eight times greater than for fires not related to hoarding (Lucini, Monk, & Szlatenyi, 2009). Health complaints are also related to the inability of hoarders to properly clean their living space. Hence, the frequency of illnesses due to poor sanitation is greatly amplified, especially among hoarders who pathologically collect living specimens, including animals (Castrodel et al., 2010).

In addition to the possibility of direct physical harm, hoarding is almost always associated with troubled interpersonal relationships (Grisham et al., 2008). Hoarders are prone to social isolation and report high levels of social anxiety and social phobia (Samuels et al., 2002a). One contribution of the current study will be to provide further information into the bidirectional nature of the association between hoarding disorder and interpersonal difficulties, and to assess whether poor interpersonal relationships may play a role in the development of hoarding disorder.

Hoarding disorder can inflict a heavy toll on community health and well-being. Public health agencies report having to make several attempts to resolve hoarding-related complaints, which often include sending out city officials to remove possessions from cluttered homes. In 2009, a study commissioned by the City of San Francisco (San Francisco Task Force on Compulsive Hoarding) estimated that hoarding costs service providers and landlords nearly \$6.4

million per year, and this was presumed to be an underestimate. Furthermore, intervention attempts may have to be repeated if the hoarding behavior resumes once officials empty or destroy an unsafe house (Tolin, Frost, Steketee, Gray, & Fitch, 2008; Tolin, 2011). For elderly hoarders, public health service providers commonly complain about “patterns of re-cluttering” (Reid et al., 2011). Re-cluttering has been linked to faulty cognitions about the disposal of waste, and other economic reasoning strategies (Tolin & Villavicencio, 2011). Hoarding is therefore considered to be a significant public health burden that commonly occurs with noticeable impairment in social and occupational functioning, reduced physical health, and high levels of social service involvement (Frost et al., 2012; Mueller et al., 2009, Tolin et al., 2011).

Prevalence of hoarding. Epidemiological research on DSM 5 symptomatology of hoarding disorder places the point prevalence rate of HD between 2 and 6% (Frost et al, 2008; Frost et al., 2011; Iervolino et al., 2009; Mueller et al., 2009, Samuels et al., 2008) in OCD samples. However, as discussed by Steketee & Frost (2003), following the publication of a previous epidemiological study (Samuels et al., 2002a; Samuels et al., 2002b), due to the fact that hoarding can occur without OCD, this is likely an underestimate. Moreover, since much of the existing research on hoarding is derived from OCD samples, and because the small number of studies that explicitly recruited for hoarding behavior found co-morbid OCD in only a few cases (Samuels et al., 2008), the prevalence of OCD in people with HD remains unclear. According to Kress et al., (2016), there have not been, to date, any national epidemiological studies that can confirm the true prevalence of this disorder, with factors such as embarrassment and lack of insight about the severity of the problem further confounding prevalence estimates.

Etiology and risk factors of hoarding. Hoarding presumably begins in late childhood or early adolescence (Ayers, Saxena, & Golshan et al., 2010). However, studies that

seek to determine age of onset are compromised in their accuracy because generally hoarding is not recognized as a serious problem until around 8 years after the first symptoms appear (Frost & Gross, 1993). Since age of onset is largely assessed retrospectively this leaves considerable room for memory errors related to when symptoms began. HD symptoms often continue to develop over ones lifespan, as individuals with HD may be reluctant to change their behaviors (Grisham Frost, Steketee, Kim, & Hood, 2006; Wheaton, Cromer, LaSalle-Ricci, & Murphy, 2008). HD appears to be more prevalent in an older adults (i.e., ages 55–94 years; APA, 2013) than in younger adults, with the average age of those seeking treatment for HD around 50 years old (Samuels et al., 2008). This is likely because the effects of hoarding escalate over time, and because the acquisition of an unusually large amount of possessions takes time to amass (Ayers et al., 2010).

While early material deprivation was initially thought to be a risk factor for hoarding behavior (Frost & Gross, 1993), empirically studies have not found evidence of this (Landau et al., 2011). However, traumatic life events have been positively associated with hoarding behavior. In one study, Hartl, Duggany, Allen, Steketee, and Frost (2005) found that participants with hoarding reported having experienced greater frequency and greater number of different types of traumatic events, compared to controls. In another study, Cromer, Schmidt, and Murphy (2007) reported that adults with OCD and hoarding behavior reported significantly more traumatic life events, with the number of traumatic events experienced predicting level of hoarding severity. Varra et al (2008) propose that childhood trauma may affect the formation of early healthy attachment relationships.

Hoarding and co-morbid disorders. High rates of comorbid major depressive disorder (MDD), as well as impulse control disorders (acquisition-related), have been found in clinical HD samples (Frost, et al., 2011). High rates of hoarding are also found with comorbid

inattentive-type attention-deficit hyper-activity disorder (ADHD). Tolin (2011) found that approximately, 42% of participants with ADHD exhibited hoarding symptomatology compared to 29% of participants without ADHD. Individuals with hoarding behavior are also at increased risk of having traits characteristic of obsessive-compulsive, dependent, avoidant, and schizotypal personality disorders (Samuels, Bienvenu, et al., 2007; Samuels, Shugart, et al., 2007). Hoarding symptoms, particularly in older persons, are associated with worse general health compared to similarly aged control groups (Ayers & Strickland, 2014). Co-existing health conditions have been shown to proliferate the global impairment of the individual with the hoarding disorder (Mataix-Cols, 2011), and yet it is often a coexisting disorder, such as ADHD, that brings the individual to seek professional help (Frost, Steketee, & Tolin, 2011), rather than the problem of hoarding itself.

Current conceptualizations of hoarding. Currently, there are two main conceptualizations of hoarding in the literature: The site security model, which takes a biological/evolutionary perspective (Andersson & Krebs, 1978; Kellett, 2007) and the cognitive-behavioral model (Frost & Gross, 1993). Each will be discussed briefly, and then will be followed by an introduction to my proposed attachment-based model, which will address questions that these prior conceptualizations have yet to answer, and may be better understood within the context of attachment theory.

The site-security model. Kellett (2007) proposed an evolutionary-based site-security model, which was derived from synthesizing qualitative and quantitative data across animal and human species. The model proposes that hoarding offers biological and psychological security by ensuring that food (and other necessary resources) will always be accessible. This is especially advantageous in uncontrollable environmental conditions that do not readily

support acquisition opportunities. By storing resources at one site, usually where the organism lives (sleeps and eats), physical access to key resources is assured. Thus, from an evolutionary point of view, genes that allow for hoarding behaviors, such as the control and conservation of material resources, also increase likelihood of survival during times of threat or scarcity.

Natural and sexual selection pressures further favoring these genes to be passed on from one generation to the next. Empirical evidence supports a biological position, with research finding approximately 50% of the variance in compulsive hoarding in women due to genetic factors, with non-shared environmental factors and measurement error accounting for the other 50% (Iervolino et al., 2009).

In the past, hoarding may have been advantageous to humans when the food supplies were never guaranteed (e.g., in hunter-gatherer times where foraging was required if one was to have food). Today, in the Western developed world, hoarding behaviors are almost always maladaptive in the sense that we live in times of “plenty”. Therefore, it is possible that genes are still manifesting behaviors for which they were programmed, but these behaviors are no longer environmentally or sexually advantageous (i.e., phylogenetic inertia – the tendency for phenotypic traits to resist any physical change in its state of motion or rest, or to resist any change in its direction of growth/evolution).

The focus of the evolutionary based site-security model is safety and security. Inanimate objects serving security needs, such as transitional objects in childhood (Winnicott, 1975), are generally perceived to have limited value once they have served their intended purpose, and are often appropriately discarded. In contrast, for hoarders every item is perceived as unique, and every item is treated as if an “exclusive resource” (Furby, 1978). With many exclusive resources on hand hoarders feel less vulnerable to threat in times when

they might need a resource that is otherwise unavailable. The psychological security such objects confer is readily apparent upon threats of removal of hoarded belongings (Grisham et al., 2008).

Limitations of this model are generally cited as methodological; however, I have not been able to find any reason offered by the site security model that informs where a lack of safety and security come from when plenty of resources abound. Furthermore, the “exclusive resource” hypothesis, which explains why hoarders save and do not discard items does not address why hoarders need such a high degree of protection when there is no apparent threat. An exploration of the motivation to save food or other items when there is an abundance of resources available is an important area for further exploration. Questions such as “Why don’t hoarders turn to other people for support”, the way many people do when threatened; Or, “Why do hoarders feel they need to personally own all necessary resources instead of just asking for help if necessary” may be better answered by turning to the attachment literature where studies examine the compensatory ways that people behave when their safety and security needs are unmet by others.

The cognitive-behavioral model. The cognitive-behavioural model of hoarding (Frost and Hartl, 1996; Steketee et al., 2003) asserts that the primary features of hoarding (acquisition, difficulty discarding, and clutter) stem from several core vulnerabilities, such as early experiences, genetic predisposition, character/structural deficits, and both anxiety and mood disorders (Frost & Tolin, 2008).

In vulnerable persons, cognitive information processing deficits (mainly executive functioning difficulties with sustained attention, decision-making, and organizing) often result in erroneous beliefs about and attachments to possessions, which lead to negative emotions

that result in avoidance behaviours (such as saving items with no apparent use) and clutter. As well, the experience of pleasure associated with attachment to ones belongings may positively reinforce and thereby contribute to the excessive acquiring and clutter associated with HD.

While CBT for HD has demonstrated reliable change, a recent meta-analysis on the efficacy of CBT for HD (Tolin et al., 2015) found that less than 40% of patients demonstrated clinically significant change (using pre to post treatment scores, given the test-retest reliability coefficient). In what follows, I describe the four core deficits outlined by the CBT model for hoarding.

Information processing deficits. According to Grisham et al., (2010) individuals who hoard demonstrate difficulties in decision-making, categorization, organization, and memory. These difficulties have largely been explained by the *under-inclusion hypothesis*, which states that hoarders perceive every item as unique, and so hoarders create a special category for each one and therefore resist storing them together (Frost & Hartl, 1996). There is little evidence as to whether individuals who hoard reliably demonstrate significant difficulties with categorization on clinical reports or in empirical studies (Wincze, Steketee, & Frost, 2007). In one study, however, the hoarding participants reported significantly more distress and anxiety than non-clinical hoarders while sorting (Grisham et al., 2010). Additionally, hoarders demonstrate distractibility and difficulty in maintaining attention on tasks (Grisham et al., 2010), like organizing clutter in the home. Based on such empirical findings, Wheaton (2016) suggests that attentional issues for those with HD are limited to domains of attention that require sustained attention on a single task.

Emotional attachments. The formation of attachments to possession in itself is not itself unusual or problematic. However, in compulsive hoarding the idiosyncratic specificities of

which objects one is attached to, the strength (stability) of this attachment, and the level (intensity) of attachment are seemingly maladaptive. Experimental studies have shown individuals with clinical hoarding behavior generate more reasons to save objects than non-clinical controls (Frost & Steketee, 1998).

According to Furby (1978), emotional attachments to objects can form as a result of its perceived instrumental value (i.e., how the object can be used and what information it provides), its intrinsic value (the perception that the object is unlike any other), as well as its sentimental value. Furthermore, objects may be perceived over time as extensions and/or representations of aspects of the hoarder's identity, and thus loss of possessions can threaten loss to an already tenuous sense of self (Kellett & Knight 2003)

Avoidance behaviors. In addition to avoiding discarding items and making decisions, compulsive hoarders are likely to avoid tasks of daily living, such as sorting mail, returning calls, or washing dishes (Grisham & Barlow, 2005; Tolin & Frost, 2008). The CBT model posits that hoarders escape the anxiety associated with discarding possessions by continually avoiding the task. Presumably, saving behaviors avail individuals who hoard the opportunity to avoid feelings associated with potentially negative consequences, such as making the wrong decision and throwing out a needed possession (Frost & Hartl, 1996). Escaping the anxiety by avoiding the task thereby increases the amount of clutter and adds to the already existing anxiety about having to sort through excessive amounts of possessions. The alleviation of anxiety that comes with the avoidance of discarding items is a powerful contingent negative reinforcer.

To distinguish hoarding from the natural tendency of letting things pile up is the presence of all three components of the disorder (i.e., excessive acquisition, difficulty discarding, and the build up of clutter) accompanied by distress or interference with daily

living. The visual presence of clutter does not necessarily imply that one has a problem with hoarding. Papers piled up on home or office desks due to a lack of time and energy devoted to organizing and clearing should not be considered the same phenomenon as objects piled up due to extreme feelings of angst and despair when considering their discard or removal.

Beliefs about possessions. Hoarders harbor strong false beliefs about their responsibility for what happens to their possessions and are vigilant to avoid being wasteful or irresponsible with their belongings. To hoarders, every item has special significance (i.e., exclusive resource hypothesis as discussed above). They hold unrealistic expectations of themselves to not be wasteful, and to be prepared for anything. Further, because they worry that their memory is poor, they feel compelled to keep belongings in sight or else they are likely to forget where they put them (Frost & Hartl, 1996).

The cognitive-behavioral model appears to be the most comprehensive interpretation of a complex and newly explored disorder. Wheaton (2016), however, brings attention to its incompleteness, suggesting where and how researchers must refine and/or expand it, particularly to include additional factors such as experiential avoidance, distress intolerance and intolerance of uncertainty.

The CBT model nicely outlines the four dimensions associated with hoarding. One possible limitation, however, is the inclusion of emotional attachment as a type of saving cognition. The Saving Cognitions Inventory (SCI), which is used to measure distorted cognitions about saving and discarding objects, includes a subscale to assess emotional attachment to objects. However, the items appear to tap beliefs about what will happen if the item is discarded, rather than asking about whether the object provides an experiential sense of security. Additionally, the model seemingly lacks a place for disordered attachment processes

and social interaction with people. This study will address questions such as could the emotional attachment component play a more primary role in the disorder than the other three “cognitive” components? Might the emotional attachment (labeled as a cognitive component) possibly contribute to the information processing deficits, behavioral avoidance, and false beliefs associated with hoarding?

Relevance of the Proposed Study

Both the site-security and cognitive-behavioral model have made significant contributions to the literature. However, both models have limitations in the extent to which they currently inform effective treatments for hoarding. Traditional CBT has been shown to have poor outcomes in contrast to outcomes of CBT therapy for OCD without hoarding (Saxena & Maidment, 2004). The site security model, which frames hoarding as evolutionarily adaptive, does not fully explain what has gone awry, or why all people with hoarding genes do not become hoarders, especially given high rates of heritability (Iervolino et al., 2009).

The need to investigate the attachment histories of hoarders has been documented as a necessary step for future research (Grisham & Barlow, 2005). To date, there are few studies (Nedelisky & Steele, 2009; Keefer et al., 2012) that examine the relationships hoarders have with their belongings, in comparison to their relationships with people. Keefer et al. (2012) examined the effects of priming insecure attachment style on level of object attachment, and found that when primed with a close other’s unreliability, individuals showed increased desire to get back personal possessions, and that this effect was mediated by attachment anxiety. Nedelisky and Steele (2009) found no significant differences in the levels of overall secure attachment to inanimate objects when comparing hoarding and non-hoarding individuals with

OCD. Given these mixed findings, I devised a new model of hoarding based on attachment theory. My model was conjectured upon the observation that specific correlates of hoarding were also correlates of attachment style. Specifically, interpersonal problems and compensatory object-oriented emotional regulation strategies are correlated with both hoarding and attachment. Given the observed similarities in variables that correlate with both hoarding behavior and insecure attachment styles, the proposed multiple mediator model was designed to assess the simultaneous indirect effect of insecure interpersonal attachments on hoarding behavior.

In sum, the present study examined whether attachment theory can contribute some possible missing pieces in the site security and cognitive-behavioral conceptualizations discussed above. Given that hoarders have a seemingly irrational attachment to their belongings, and given that the common denominator of both the evolutionary and cognitive-behavioral models is the desire for security and emotional attachment, hoarding can be conceptualized as an attachment-related disorder.

In the current study, attachment style is used as a proxy to represent general safety and security in the world. The basic premise of the theory (and the model) is that hoarders are using objects to fulfill their unmet intrinsic security needs. Undoubtedly there are other reasons why an individual would not feel safe (e.g., intrinsic neurotic temperament, genetic vulnerability, prior trauma, etc...). However, the focus of the proposed model and study is on understanding how objects, in the form of personal belongings, may serve as a surrogate secure attachment relationship for individuals with an insecure interpersonal attachment style.

The following section will review the attachment literature in the context of previously established relationships between attachment security and relationship

satisfaction, emotional regulation, and saving cognitions (hoarding beliefs). Once the correlates of attachment style in question are introduced I will synthesize findings from the hoarding and attachment literatures, and subsequently introduce the proposed attachment-based model along with the rationale for each of the study's hypotheses.

Attachment Literature Review

Origins of attachment theory. Attachment theory [Bowlby, (1969/1973/1980, 1988), Ainsworth (1978), Hazan & Shaver (1987), Bartholomew (1990)] is one way that researchers have come to understand the development and maintenance of close emotional relationships. Bowlby's conceptualization (1969) maintained that infants possess an inherent motivation to seek proximity to a caregiver in times of danger or threat, as a way to ensure their safety and security. If a caregiver were perceived as available and dependable, the child would experience their caregiver as a source of security. If, however, caregivers were unresponsive and unavailable, the child would not experience their caregiver as a source of security. Furthermore, Bowlby proposed that these original attachment relationships formed prototypical internal representations for how the child would experience interpersonal relationships through their lifetime. These "working models" were of two kinds: Working models of one's self (lovability), and working models of others (their dependability or intentions). Children who experienced themselves as loveable, and others as dependable, would have a higher quality of attachment (i.e., feel more secure) with their caregivers than children who did not feel loved or learned that they could not reliably depend on their caregivers.

Ainsworth and Wittig (1969) designed a structured laboratory procedure, known as the "Strange Situation", to test the original theories put forth by Bowlby. The aim of this

procedure was to examine how children respond to parents leaving them alone in a room with a stranger, as well as how they respond when the parents returned. Ainsworth observed infants' responses in one of three distinct ways and classified them as follows: Children who welcomed the return of their caregiver, and would seek proximity and care-giving upon reunion were classified as *secure*. Children who were ambivalent upon the parents return, and who could not be easily comforted upon reunion were classified as *anxious-resistant*. Children who avoided their caregiver upon return to the room, as well as avoiding any proximity to, or comfort from, the caregiver were classified as *avoidant* (Ainsworth et al., 1978). These patterns of attachment behavior were theorized to continue throughout the lifespan if parental behavior were to continue to be the same (Lamb, Thompson, Gardner, Charnov, 1985).

Measurement of attachment in adulthood. Interest in how infant-caregiver attachments would affect the quality of interpersonal relationships over the lifespan prompted the development of a variety of adult attachment measures. Overall, these measures find adult analogues of the attachment styles seen in children. For example, findings from studies using the Adult Attachment Interview (AAI; Georges, Kaplan, & Main, 1987), which evaluates working models of relationships in adulthood using a semi-structured interview, suggest there are secure, anxious, and avoidant attachment styles in adulthood (Main & Goldwyn, 1998). Findings from another study using the AAI identified adults as secure when they had both positive representations of self and others, avoidant when they held a positive view of self but negative view of others, or preoccupied if they held a negative view of self but a positive view of others (Kobak & Sceery, 1988). In addition to studies using the AAI, Hazan & Shaver's self-report measure of adult romantic attachment (1987) also finds three adult analogue attachment styles: secure, anxious/ambivalent, and avoidant.

Succeeding the development of measures supporting a three-category model of adult attachment were measures that supported the four-category model of attachment as conceptualized by Bartholomew (1990). Bartholomew and Horowitz (1991) offered a four- category model based on the cross products of a 2 X 2 matrix with the dimensions “model of self” and “model of others”, each with a positive and a negative category.

		Model of Self (Dependability)	
		Positive (Low)	Negative (High)
Model of Other (Availability)	Positive (Low)	Secure Comfortable with intimacy and autonomy	Preoccupied Preoccupied with relationships
	Negative (High)	Dismissive-Avoidant Dismissing of intimacy Counter-dependant	Fearful-Avoidant Fearful of intimacy Socially avoidant

Figure 1. Bartholomew’s 4 Category Model.

The main contribution of the four-category model is that it offers more information regarding one’s motivation to avoid by differentiating between fearful-avoidance and

dismissive-avoidance. The fearful-avoidant style is characterized by the desire for an emotional relationship combined with a general distrust of the dependability of others, which prevents them from seeking such a relationship. In contrast, the dismissive-avoidant style does not even desire an emotional relationship, and avoids it for this reason altogether.

Assessing Attachment in the Proposed Study

The major criticism of both the 3 and 4 category models for adult attachment was the observation that Ainsworth's three infant-caregiver attachment styles were not originally conceptualized as categorical but rather dimensional, and thus adult assessment tools that classify individuals categorically may not demonstrate construct validity (Brennen et al., 1998). Consequently, Brennen et al., (1998) embarked upon a large project that took all 60 prior (adult) attachment subscales offered by various researchers using all the different attachment constructs available, and subjected them to rigorous factor and discriminant analysis investigations (see Brennen et al., 1998, for review). The result was a 36-item measure consisting of two subscales: avoidance and anxiety. Currently, most contemporary researchers use this comprehensive measure owing to its dimensional nature and because these dimensions map onto the Bartholomew 4-category model quite well (Brennen et al., 1998).

The current study will use the measure by Brennen et al., (1998) for these reasons. An additional reason is because one objective of the proposed study is to gain a deeper understanding of avoidance behavior in hoarding, and more information regarding reasons for avoidance can be gleaned by using Bartholomew's categories (via the scales designed by Brennen et al., 1998), which differentiates between two kinds of avoidance: fearful and dismissive.

Correlates of Insecure Attachment

Relationship satisfaction. Studies on adult attachment have consistently found that individuals with an insecure style tend to report more negative interpersonal experiences than those with secure styles. In the seminal study by Hazan and Shaver (1987), using their three-category romantic attachment model, insecurely-attached adults in romantic relationships were more fearful of closeness, more prone to emotional extremes, and experienced less general friendliness in their relationship compared to securely- attached adults. In contrast, securely attached adults reported that people almost always liked them, and that they believed others were generally good-hearted; they also reported higher levels of warmth from parents during childhood relative to those who were insecurely attached.

Since Hazan and Shaver (1987), numerous studies have examined the effects of insecure attachment on relationship satisfaction. Overall, studies have found that couples report more dissatisfaction when both partners are of the anxious-insecure attachment style, or when one partner is anxious- and the other is avoidant- attachment style (Allison, Bartholomew, Mayseless, & Dutton, 2008; Kirkpatrick & Davis, 1994; Li & Chan, 2012; Roberts & Noller, 1998). Moreover, the combined results of these studies suggest that an insecure-avoidant attachment style is associated with lower levels of relationship satisfaction, commitment, and trust in comparison to a secure attachment style, whereas an anxious-insecure attachment style is associated with lower levels of relationship satisfaction, increased levels of conflict, and ambivalence within the relationship (Creasey & Hesson-McInnis, 2001; Feeney, 1999; Feeney & Noller, 1990; Levy & Davis, 1988; Simpson, 1990; Tran & Simpson, 2009; Woodhouse, Dykas, & Cassidy, 2009).

In a recent meta-analysis (Li & Chan, 2012), both anxious and avoidant attachment

were found to negatively impact cognitive, emotional, and behavioural aspects of relationship quality. When compared with the anxious-insecure attachment style, avoidant-insecure attachment style showed significantly stronger negative correlations with general satisfaction, connectedness, and general support in relationships. In contrast, anxiety showed significantly stronger positive correlations with general conflict in relationships.

One possible implication of these results is that insecurely attached individuals adopt a compensatory style of emotional regulation when their interpersonal needs are not met, whereas securely attached individuals do not. This would support theories positing that insecure attachment may result in persons trying alternative ways to find secure attachment relationships, including, attachment to objects (Norris, Lambert, DeWall, & Fincham, 2012). Additionally, Keefer, Landau, Rothschild, and Sullivan (2012) propose that threats to the security of an attachment relationship may lead to compensatory responses, such as attachment to inanimate objects. Evidence supporting emotionally-based compensation for insecure-attachment relationships will be discussed next.

Compensatory object-oriented emotional regulation. Due to the importance of good interpersonal relationships for health and well-being, researchers have begun to examine what kinds of compensatory strategies people use when significant people in their life do not meet their needs for belonging and security. Preliminary evidence (reviewed below) suggests that interpersonally unsatisfied and lonely individuals seek to reduce loneliness or decrease dissatisfaction with their interpersonal relationships in a number of ways, which revolve around substituting relationships with non-human entities. In what follows, I will briefly document some of these compensatory strategies in order to establish the plausibility of the general strategy of compensation, before proposing hoarding as a type of compensation.

One formally documented compensatory strategy implicates the use of a relationship with God as a form of surrogate secure attachment when close others are perceived as unavailable or unreliable (Granqvist & Kirkpatrick, 2008). Early research on this subject found a positive association between insecure-attachment and emotionally-based (as opposed to socially-based) relationships with God (Granqvist & Hagekull, 1999, 2000, 2002). Whereas securely attached adults reported that their relationships with God were primarily influenced by parental role-modeling or social learning, insecurely attached adults raised in non-religious households (e.g., Granqvist, 1998; Kirkpatrick & Shaver, 1990) reported their relationships with God developed following situations of emotional loss (Granqvist & Hagekull, 1999; 2002). Consequently, Granqvist (2003) formulated the “emotional compensation hypothesis”, which proposes that God functions as a substitute attachment figure for insecurely attached adults.

According to Granqvist’s emotional compensation hypothesis (2003), the insecure attachment-related pathway to religiosity begins with attempts to emotionally regulate feelings of distress following experiences with insensitive caregivers (the “compensation pathway”). Typically, such close relationships with God wax and wane over time depending on one’s level of need to regulate distress. For instance, individuals with an insecure—and particularly anxious/ambivalent—interpersonal attachment orientation are more likely to experience sharp increases in religiosity following life situations of considerable emotional turmoil (Kirkpatrick, 1997, 1998), most notably interpersonal crises (e.g., Granqvist, 2002, 2008; Granqvist & Hagekull, 2003).

They hypothesized that insecurely attached adults would be more likely than securely attached adults to turn to God as a source of security. The position that God can serve as an

attachment figure has been largely accepted. For example, studies have revealed that God serves as a safe haven in times of threat. Additional evidence that supports God as an attachment surrogate for the insecurely attached comes from studies that find these types of relationships with God are malleable over time. Secure individuals report a consistent relationship with God, whereas insecurely attached individuals demonstrate a greater likely to waver emotionally in their relationship with God (Granqvist & Hagekull, 2002).

Studies examining attachment surrogates for insecure-adults have been extended to pet studies. Beck and Madresh (2008) found that insecurely attached adults reported more security and closeness with pets than with their significant others. In a series of studies examining the psychometric properties of the Lexington Attachment to Pets Scale (LAPS; Johnson, Garrity, & Stallones, 1992) three factors were found for the motivation underlying pet adoption: welfare and humane reasons, love of animals, and the third, which is most pertinent for our study: “people substitution”. The finding that people will adopt pets to replace emotional needs unmet by people supports the position that insecure-attached individuals will emotionally compensate by finding an attachment surrogate.

Recently, social snacking theory (Gardner et al., 2005) informed the attachment literature that individuals also turn to inanimate objects, such as television, radio, or photographs when they are metaphorically “socially hungry”. Studies have confirmed the use of various non- personal and inanimate objects as “interpersonal reminders”, which serve to increase one’s feeling of social connectedness. This is consistent with early object-relations theories such as Winnicott’s theory of transitional objects, which describes how children often attach themselves to a transitional object, such as a blanket or toy, during the necessary stage of separation from their caregivers. Several seminal research studies support the use of

transitional object attachment as a way to generating feelings of safety and security when parents are not around (Triebenbacher & Tegano, 1993; Triebenbacher, 1997).

Together, these findings indicate that people with insecure-attachment utilize compensatory object-oriented emotional regulation strategies to meet their unmet interpersonal attachment-related needs of love, relatedness, safety and security.

Current Study

The study was granted ethical, and ethical amendment, approval by the University of Human Ethics Review Board in January and April of 2013, respectively (Appendices G & Appendix H).

The Proposed Model

The rationale for the proposed study is based on the findings discussed above showing that people often seek out “surrogate” attachment figures to feel safe and secure when a secure attachment style within close relationships is lacking. For example, individuals lacking in secure attachment relationships may find attachment security through development of a close relationship with God, or a pet. Further support for a “hoarding as emotional compensation” theory comes from studies showing that in comparison to non-hoarders, hoarders often lack social connection, report high levels of loneliness, are less likely to be married, and are at greater risk for the development of social isolation, social anxiety, and social phobia (Muroff et al., 2009). Ultimately, this study was designed to explore whether the strong emotional attachment hoarders have to their personal belongings is related to a lack of secure attachments with the close significant others’ in their lives. It will be useful to assess whether emotional attachment to possessions in hoarding functions as a maladaptive attempt to feel some sort of secure

environment in the face of disappointing interpersonal relationship attachments.

The model in Fig 2 (below) illustrates an idealized and simplified preliminary model of how attachment style is proposed to relate to relationship satisfaction, compensatory object-oriented emotional regulation, hoarding beliefs and ultimately hoarding behavior.

Undoubtedly the final empirical model will likely diverge from the proposed model via the addition of various unspecified paths. In view of the dearth of prior research and the large number of possible models that might be proposed, a relatively parsimonious model provides a starting place for the present study. The rationale for the proposed sequence, beginning with insecure attachment and resulting in hoarding behavior, through the joint effect of relationship satisfaction, attachment to objects, and saving cognitions is based on the most likely developmental sequence of influence, beginning with the development of disordered attachment in infancy and culminating in hoarding behaviors in late childhood or adolescence, occurring jointly through relationship satisfaction, attachment to objects, and saving cognitions. It is understood that the proposed cross-sectional design will be limited in its ability to measure and represent this historical sequence of influences. Nonetheless, as a first approximation, the proposed study may find enough evidence to support more resource-intensive, but definitive, prospective research.

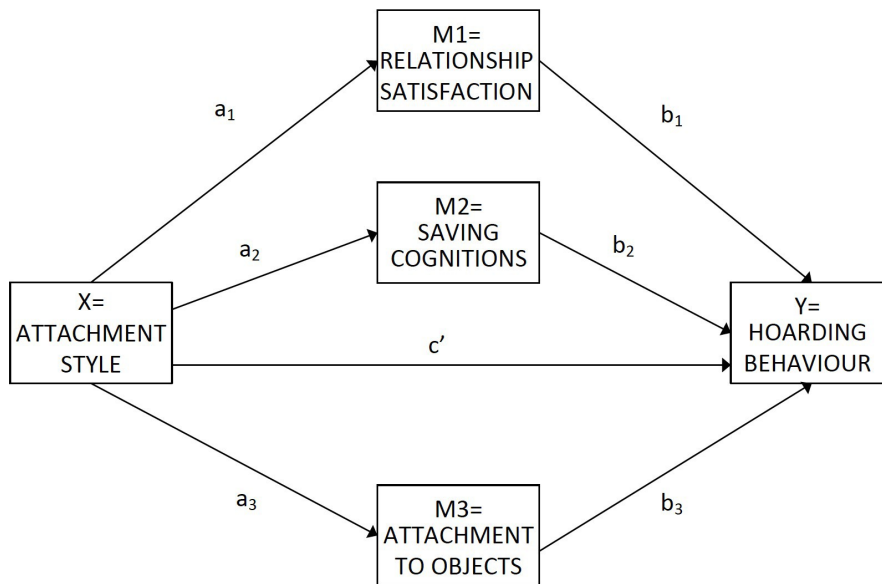


Figure 2. The Proposed Mediation Model

The center-line, labeled c' , denotes the direct path from attachment style to hoarding behavior when all the mediators are included in the model. Indirect paths coefficients are labeled with the small letter's 'a' and 'b' and the numerical subscripts 1, 2 and 3 designate the three indirect pathways to be tested (a_1b_1), (a_2b_2), and (a_3b_3). The parallel multiple mediator model does not assess for the unfolding nature of the indirect effect. Rather, significant indirect effects suggest that the mediators act together to simultaneously affect how insecure attachment style is related to hoarding behavior. If support were found for this model it would link variables common to both interpersonal attachment difficulties and difficulties with excessive attachment to personal belongings. Prior research (Keefer et al., 2012) has shown that hoarders derive a felt sense of security from their belongings. Thus, one way to conceptualize the indirect effect of insecure attachment style on hoarding is to view the emotional attachment to objects as a form of security. If known correlates of attachment style (i.e., relationship satisfaction) and known correlates of hoarding behavior (i.e., emotional

attachment to objects and saving cognitions) show statistically significant associations this would lend support to the theories of emotional compensation.

Objectives and Hypotheses of the Study

The objective of the study was to test whether the components of the proposed model, namely, attachment security, poor interpersonal relationships (i.e., relationship satisfaction), compensatory object-oriented emotional regulation (i.e., attachment to objects), and hoarding beliefs (i.e., saving cognitions) would (a) be associated with hoarding behavior in general, and (b) relate in a manner consistent with the proposed mediational model.

Based on findings from prior studies and the theories described above, my hypotheses are as follows:

1. Both the anxious and avoidant dimensions of attachment style will display positive correlations with hoarding behavior, with the strength of the relationship being stronger for the anxious dimension.
2. Both the anxious and avoidant dimensions of attachment style will display negative correlations with relationship satisfaction, with the strength of the relationship being stronger for the anxious dimension.
3. Both the anxious and avoidant dimensions of attachment style will display positive correlations with attachment to objects, with the strength of the relationship being stronger for the anxious dimension.
4. Both the anxious and avoidant dimensions of attachment style will display positive correlations with saving cognitions, with the strength of the relationship being stronger for the anxious dimension.

5. Relationship satisfaction, attachment to objects, and hoarding cognitions will jointly mediate the relationship between attachment security and hoarding behaviors.
6. There will be an interaction between the anxious and avoidant dimensions of attachment, such that individuals who score high on both dimensions (which corresponds to Bartholomew's *fearful-avoidant* category) will score highest on hoarding behavior, hoarding cognitions, and attachment to objects, and lowest on relationship satisfaction.

Method

Participants

Paid participants were sourced using Amazon's Mechanical Turk (mTurk), a web-based subject recruitment service. Overall, 4181 individuals sourced from mTurk completed the online study, which specifically asked for participation from individuals residing in Canada or the United States, between 18 and 55 years in age, and who spoke English as their most fluent language. Henceforth, these three criteria of location, age and language will be collectively referred to as the study's three inclusion criteria. The advertisement for the survey indicated that only participants meeting the study's inclusion criteria would be eligible for the full financial compensation of \$1.00 (ten cents to be paid immediately upon submission and an additional ninety cents once location had been verified). Therefore, to verify location, Geo IP address location software was used (see www.maxmind.com for additional information on IP address location programs).

Although I specifically advertised for individuals from the United States and Canada, a large number of surveys were still submitted from third-world or developing countries (primarily India and China). In order to compare the results of the current study with the normative data available to date, I decided not to include surveys submitted from outside the

United States or Canada. To date, there is a dearth of information in the literature about hoarding in third-world or other developing countries, but this is an exciting area for future research. Following the removal of ineligible surveys ($n = 2701$), and then using the missing value analysis protocol (described in the procedure section below) on the eligible surveys ($n = 1480$), followed by the removal of missing cases ($n = 137$) and multivariate outliers ($n = 2$) (described in the Data Preparation section of the Results), left a total of 1341 surveys that were deemed eligible and used for the analysis of the data.

Demographic analyses of specific questions regarding age, gender, relationship, and socio-economic status revealed that the sample was 64% female and 36% male. Almost 75% of participants reported being less than 40 years of age, with 45% reporting ages between 20 and 30, and 25% between the ages of 30 and 40. The sample was comprised of Canadian and American individuals of various ethnicities: Caucasian/European (80%), Asian (5%), African (6%), Central American (1%), South American (1%), Aboriginal, East Indian, Polynesian, and Middle Eastern (each $< 1\%$), and 5% self-identifying as “Other”.

Following the removal of surveys that were submitted from outside of the United States or Canada according to Geo IP address location ($n = 2472$), the subsequent removal of respondents who reported being outside the required age interval of 18 to 65 ($n = 54$), and then the removal of any remaining respondents whose survey responses indicated that English was not their most fluently spoken language ($n = 19$), only 1636 surveys remained. The sample size was further reduced by removing duplicate survey entries, first as determined by IP address ($n = 43$) and next by mTurk Worker ID ($n = 113$). This procedure of removal of ineligible surveys generated a sample size of $n = 1480$ before examination for missing data and single or multivariate outliers.

Procedure

The study was posted on the mTurk worker website advertised as a Master's thesis study requiring participation in an online survey entitled "An Attachment-Based Model of Hoarding". Following established protocols, participants of my study were required to complete information and consent documentation in two stages (see Appendices I & K). I stated that I was interested in their opinions, attitudes, thoughts, and feelings about various relationship patterns, with both animate and inanimate objects. For example, "I am interested in knowing how satisfied you are in your close relationships and how attached you feel to the things that you own."

The instructions for payment stipulated that monies will be deposited into mTurk worker accounts following verification of location (using Geo IP location programs), age and language criteria, and that only first submissions that were verified would be paid the \$1.00. Any individuals meeting all three of the study's inclusion criteria (i.e., must be from the United States or Canada, between the ages of 18 and 65, and report English as most fluent language) were accepted to complete the online survey. Participants viewing my study on mTurk could click on a link and be taken directly to my survey, administered using Qualtrics survey software.

In addition to demographic questions about age, gender, relationship, and socio-economic status, participants completed online measures of insecure attachment styles, relationship satisfaction, attachment to objects, saving cognitions, and hoarding behaviors. Upon survey completion, the Qualtrics random number generator was programmed to assign each participant a 4 digit code, which participants were asked to write down or copy, and then immediately enter into mTurk code matching feature that approves the worker's account for payment. Participants with matching Qualtrics and mTurk codes received financial compensation of \$1.00. All

applicants were required to click “agree” on the online informed consent document, which explained who would be paid (i.e., those meeting the study’s inclusion criteria), and when they would be paid (once the code given in Qualtrics was entered into mTurk).

Measures

The Savings Inventory-Revised (SI-R; Frost et al., 2004). This 23-item questionnaire is comprised of three factor analytically defined subscales: Difficulty Discarding (e.g., to what extent do you have difficulty throwing things away), Excessive Clutter (e.g., to what extent does clutter prevent you from using parts of your home), and Compulsive Acquisition (e.g., how often do you feel compelled to buy or acquire free things for which you have no immediate use). The SI-R has a total score that can be created by summing all of the items from all 3 subscales.

Responses are made on a Likert-type scale from 0 (no distress) to 4 (extreme distress), thus the total scale ranges from 0-92. Two items (item 2 and item 4) required reverse scoring before summing of all scale items to arrive at the full scale score. The SI-R demonstrates adequate total scale reliability ($\alpha = .70$), and high test-re-test ($r = 0.86$) reliability (Frost et al., 2004). In clinical samples, the overall mean of the SI-R falls around 60, with a standard deviation estimate of 15 (Hartl et al., 2005). In contrast, in community samples, the mean SI-R generally falls around 23-24, with a standard deviation estimate of 10 (Frost et al., 2004). In the current study, the total SI-R scale had excellent reliability (unstandardized Cronbach’s $\alpha = .94$).

Savings Cognitions Inventory (Steketee et al., 2003). This 24-item self-report questionnaire measures the thoughts and beliefs associated with saving/hoarding behaviors. Responses are made on a 7-point Likert-type scale from 1 (not at all) to 7 (very much)

indicating the degree to which given thoughts contribute to their decisions to save or discard possessions. Support has been found for the use of an SCI total score as well as the four subscale scores (Emotional attachment, Memory, Control, and Responsibility toward possessions). Sample items include “Throwing some things away would feel like part of me is dying” (emotional attachment), “If I put this into a filing system, I’ll forget about it completely” (memory), “No one has the right to touch my possessions”, (control), “Throwing this away means wasting a valuable opportunity”(responsibility).

In the current study, my central interest was the overall indirect effect of saving cognitions (i.e., not the contribution of each subscale) on influencing the development of hoarding behaviors for individuals with an insecure attachment style. Therefore, the total SCI score was used rather than subscale scores. Although information on test- re-test reliability were unable to be found, the total score shows good internal consistency (0.97), as well as good convergent and discriminant validity, correlating more strongly with measures of hoarding than with measures of depression or general anxiety (Steketee et al., 2003). In the current study, the SCI showed excellent reliability with a Cronbach Alpha = .95.

Experiences in Close Relationships Questionnaire (ECR; Brennan, Clark, & Shaver, 1998). The ECR is a 36-item self-report measure used to assess attachment styles in adult (romantic) relationships. Participants were asked to consider their typical behavior in romantic relationships rather than a specific current relationship. The ECR is comprised of two subscales: the Anxiety subscale and the Avoidance subscale. Participants used a 7-point Likert scale (1 = disagree strongly; 7 = agree strongly) to indicate the extent to which each item’s statement is consistent or inconsistent with their own experience. Sample statements include “I need a lot of reassurance that I am loved by my significant others” (anxious), and “I find it

difficult to allow myself to depend on significant others” (avoidance).

Scores on the Anxiety subscale were used to provide a continuous measure of insecure- anxious attachment, and scores on the Avoidant subscale were used to provide a continuous measure of insecure-avoidant attachment style. Based upon their responses to the items that constitute each subscale, participants can be classified as falling into one of Bartholomew’s four quadrants (see Figure 1 above) as described earlier: low avoidance/low anxiety (secure), low avoidance/high anxiety (preoccupied), high avoidance/low anxiety (dismissing- avoidant), and high avoidance/high anxiety (fearful- avoidant). The ECR demonstrates high internal reliability ($\alpha = .91$ for the Anxiety subscale and $\alpha = .94$ for the Avoidance subscale). Alpha coefficients approach or exceed .90, and test–retest coefficients range from between .50 and .75, with little correlation between the two scales of anxiety and avoidance in most samples (Brennen et al., 1998).

Its construct validity has been demonstrated via its association with the Touch Scale (Brennan, Wu, & Loev, 1998), UCLA Loneliness Scale–Version Three (Russell, 1996), and the Social Provisions Scale (Cutrona & Russell, 1987) in undergraduate samples (Fairchild & Finney, 2006). In the current study, the ECR demonstrated excellent reliability, with anxious subscale yielding an $\alpha = .94$, and the avoidance subscale yielding an $\alpha = .95$.

Relationship Assessment Scale (RAS; Hendrick et al., 1998). The Relationship Assessment Scale (RAS; Hendrick, 1988) is a seven-item scale that was initially created to measure quality of relationship satisfaction within a marriage. It was later adapted for use with non-romantic relationships. Renshaw, McKnight, and Caska (2011) have found that the RAS can be used to adequately measure satisfaction in various types of relationships. In the current study, participants were instructed to think of their circle of “close others” and, then to choose

one of these close others while answering the questions with that person in mind.

Responses are made on a five-point Likert-type scale, and typically the seven items are summed to create a total scale score, with higher scores reflecting greater relationship satisfaction. Sample items included “To what extent has your relationship met your original expectations” and “How good is your relationship compared to most”. The scale has been found to be reliable and valid (Vaughn & Baier, 1999), although scores on the RAS also tend to be negatively skewed (Dinkel & Balck, 2005).

In the current study, the original 7-item RAS self-report questionnaire was administered along with four supplementary questions (see Appendix C), which asked participants to consider their close relationships “in general”, and were administered immediately following the original seven items of the RAS, which asked about their relationship with a single significant “close other” in mind. These items were added in order to be translatable with the study’s others scale, which predominantly used indexes of close others in a more general sense. One of the four added questions (item 11) was slightly different from the others in that it invited answers from only those individuals currently involved in a romantic relationship. Results showed 223 individuals did not answer the item, and since the item was deemed unnecessary for the main purpose of the study, item 11 was dropped. The resulting 10-item RAS-M was scored by summing all items (following the reverse scoring of items 4 and 7). The scale’s reliability was .87 with the 10-item scale. In the current study, the 10-item RAS scale is referred to as the Relationship Assessment Scale-Modified (RAS-M) to distinguish it from the traditional 7 item RAS.

Attachment To Objects (ATO). While hoarding research continues to develop measures to assess the severity of hoarding behaviours, there are few measures that tap into the emotional

attachment to belongings that hoarders experience. While the saving cognitions inventory has an emotional attachment subscale, that scale was not chosen because it appeared to ask about beliefs about emotions over discarding, rather than the direct experience of an emotional attachment to ones belongings, desired for the current study.

Nedelisky and Steele (2009) devised a measure of attachment to objects by adapting the Reciprocal Attachment Questionnaire (RAQ; West, Sheldon, & Reiffer, 1987, and West & Sheldon-Keller (1992). The RAQ consists of 75 self-report items that assess attachment security (20 items across four subscales), attachment patterns (40 items across four subscales), and features of the attachment relationship (15 items across three subscales). There are nine subscales, each with between 3 - 7 items, which are rated on a five-point Likert-type scale. Greater scale and subscale scores indicate greater psychopathology of the corresponding attachment feature being measured.

By replacing the words “attachment figure” with “my belongings” in items of the RAQ, Nedelisky and Steele (2009) created the Reciprocal Attachment Questionnaire-Adapted scale (RAQ-A). Forty-four of the 75 items on the RAQ no longer made sense following this word replacement, and were not included in the RAQ-A (these items primarily asked about availability and responsiveness, reciprocity, and/or specific attachment patterns) leaving a remainder of 31 items. Nedelisky and Steele (2009) added seven new items, adapted to the population of hoarders, to the existing subscales in the measurement of inanimate object attachment. The final 38-item RAQ-A assesses inanimate object attachment security (17 items) attachment patterns (20 items), and use of the attachment relationship to inanimate objects (one item).

Although the psychometric properties of the RAQ-A have only been reported in one study (Nedelisky & Steele, 2009), estimates of reliability indicate that the full RAQ-A has good

internal consistency ($\alpha = .89$) and that all of the subscales, with the exception of Compulsive Self Reliance ($\alpha = .39$), had adequate to good reliability (α 's ranging from 0.73 to 0.85).

Since the scale had yet to be empirically validated when I began my study, I decided to first explore its structure using data collected for the current study. Consequently, to measure the construct of attachment to objects, I modified the Reciprocal Attachment Questionnaire-Adapted (RAQ-A). The following steps were undertaken to create the Attachment To Objects (ATO) scale.

Step 1. All 38 items that comprise the RAQ-A were reviewed for item-total and inter-item correlations using my data, which was collected on 1341 adults, aged 18-65, from a community sample of English speaking North Americans, who were informed the questionnaire was about their relationships to belongings. Three items (two belonging to the “compulsive self-reliance” subscale and one item belonging to the “attachment features” subscale) showed negative inter-item correlations and were regarded as bad items. Therefore, they were excluded from the next step.

Step 2. The remaining 35 RAQ-A items were subjected to Principal Component Analysis (PCA), which revealed a KMO value of .97, indicating a factorable correlation matrix. Subsequently, PCA with an oblique rotation (for correlated factors) revealed 5 principal components with Eigenvalues greater than 1 that accounted for 65.6% of the total variance. The first rotated factor corresponded with RAQ-A attachment security with 14 items, 10 of which came from the original RAQ (and 4 were unique to the RAQ-A). The top 8 loading items were all from the original RAQ (e.g., being with my belongings is my only source of security (top loading) and I protest strongly when I have to leave my belongings (second top loading)). Two of the 10 items were unique to the RAQ-A. The 10 items were

extracted and used to represent the ATO construct. The other four factors roughly corresponded to interference in daily activities due to clutter, importance of belongings, fear of loss, and positive affect related to caring for one's possessions. As these constructs were not primary interests in current study they no further examined. The 10-item ATO scale showed excellent reliability (unstandardized Cronbach's alpha = .94).

Statistical Analyses

Tests of simple associations. Hypotheses 1-4: Significant Pearson product-moment correlations in the predicted direction were considered as supporting the hypotheses.

Test of the mediational model. Hypothesis 5: In the present model, insofar as attachment styles are established early in childhood, and the participants are young adults, a distal relationship between the IV and DV exists. Accordingly, the test of mediation examined whether the proposed indirect effects linking attachment style to hoarding behavior would fall within a 95% confidence interval that excludes zero. Following current practice recommendations, bootstrapping methodology was used to test such effects, as recommended by Efron and Tibshirani, (1993). This provided a narrowing of the 95% confidence interval so as to provide more power to detect an effect. This type of empirically derived confidence interval construction is recommended for estimates of the standard error of indirect effects when the assumption of normality is likely to be violated. Evaluation of the proposed multiple mediator model used an ordinary least-squares analytic framework for estimating direct and indirect effects, and bootstrap methods to obtain confidence intervals. The SPSS macro PROCESS developed by Andrew Hayes (2012) ran the computations using bias-corrected and accelerated (BCA) bootstrapping with 5000 resamples to assess the 95% confidence interval.

Interaction effect. Hypothesis 6: I conducted a moderated regression with

continuous independent variables to assess for an interaction between attachment styles. Anxious and avoidant independent variables were centered prior to creating a product term. By entering the product term after the centered independent variables, the product term represented the interaction. Simple slopes analyses assessed significant interactions.

Results

Data Preparation

Determination of final sample. To explore the 1480 eligible cases for missing values, I began with a visual inspection of the data. Results showed that 100 individuals did not complete any items of the Attachment To Objects (ATO) scale. Since the scale was central to the analysis, and listwise comparisons would render all variables in the regression equation as missing for these cases, these 100 surveys were removed. Subsequent inspection of the remaining 1380 cases revealed 223 individuals did not respond to the last item (item eleven) on the Relationship Assessment Scale (RAS) scale. This item was constructed specifically for this study, and was the only question that was instructed to be answered only if one was in a romantic relationship. Since this question was not crucial to the scale and was missing in over 200 cases, the item was dropped, thereby allowing the nearly 200 cases to be retained in the sample, and only that item would not be further investigated.

Missing value analysis (MVA). The remaining 1380 cases were run through the missing value analysis tool in SPSS. Results of the MVA showed that no scales were missing more than 5% of data. The Attachment To Objects (ATO) scale showed the highest number of missing cases with missing data occurring for 18 individual cases, likely because it was the last survey and participants may have been experiencing fatigue. The remaining missing values on all scales (including the ATO) were considered to be missing completely at random (MCAR)

according to the test statistic generated by the Little MCAR test $\chi^2(34, N = 1341) = 33.07$, $p = .51$, suggesting there were no systematic differences between individuals with and without missing data. Although multiple imputation to fill in the missing data was considered, the SPSS macro by Hayes' (PROCESS) to be used for the study's main analysis (the multiple mediation analysis), did not, at the time of data analysis, have the capacity in its software to use the imputed values from SPSS. Accordingly, since the sample was large and the missing data met the MCAR criterion, the 37 cases with missing data (i.e., total missing across all scales) were dropped (Tabachnick & Fidell, 2011), leaving 1343 cases with complete data.

Outliers. The remaining 1343 cases were examined for univariate and multivariate outliers. One univariate outlier was found on the relationship satisfaction scale, and subsequently Winsorized. Two multivariate outliers were removed, as assessed by Mahalanobis distance with $p < .001$. The final sample was size $N = 1341$.

Descriptive Statistics

Table 1 displays the means, standard deviations, ranges, skew, and kurtosis for all raw and transformed scales. To improve normality, square root SI-R, square root SCI, Winsorized reflected square root RAS-M, and inverse ATO scales were used in data analyses. The signs ("positive" or "negative") found in all tables and figures correspond to the re-reflected RAS-M measure, and the re-inversion of the ATO scale. Therefore, all signs are in the same direction as they would be if these scales had not needed reflection due to negative skew or inversion due to extreme positive skew.

Table 1

Descriptive Statistics for Major Study Variables (N = 1341)

Variable	Observed Range		Mean	SD	Skew		Kurtosis	
	Min	Max			Estimate	SE Skew	Estimate	SE Kurtosis
ANX	18	126	70.11	23.96	-.04	.07	-.64	.13
AVD	18	126	57.69	22.82	.21	.07	-.63	.13
SI-R0 (0-4)	0	83	28.81	16.17	.58	.07	-.17	.13
SI-R1 (1-5)	23	106	51.81	16.17	.58	.07	-.17	.13
SI-R1 (Trans.)	4.8	10.10	7.11	1.11	.26	.07	-.57	.13
RAS-M	10	50	37.49	7.54	-.67	.07	.16	.13
RAS-M (Trans.)	1	6.25	3.52	1.06	-.06	.07	-.36	.13
ATO	10	50	17.20	8.78	1.38	.07	1.10	.13
ATO (Trans.)	.02	.10	.07	.03	-.32	.07	-1.30	.13
SCI	24	168	69.76	31.15	.65	.07	-.29	.13
SCI (Trans.)	4.9	12.96	8.15	1.84	.27	.07	-.80	.13

Note. ANX = Anxious Attachment Style; AVD = Avoidant Attachment Style; SI-R0 (0-4) = Saving Inventory-Revised (scale anchors 0-4 as in original scale); SI-R1 (1-5) = Saving Inventory-Revised (trans. scale anchors 1-5 as was necessary prior to square root transformation of SI-R scale for statistical analyses); RAS-M = Relationship Assessment Scale- Modified; ATO = Attachment To Objects; SCI = Saving Cognitions Inventory.

Correlation Analyses

Table 2 (below) presents correlations between major study variables. Hypotheses 1-4 were all supported. A positive association was observed between hoarding behaviors with both the anxious ($r = .38, p < .001$) and avoidant ($r = .30, p < .001$) insecure attachment styles (Hypothesis 1). A negative association was observed between relationship satisfaction and both the anxious ($r = -.34, p < .001$), and avoidant ($r = -.53, p < .001$) insecure attachment styles (Hypothesis 2). A positive association was observed between attachment to objects and both the anxious ($r = .42, p < .001$) and avoidant ($r = .38, p < .01$) insecure attachment styles (Hypothesis 3). And, a positive association was observed between saving cognitions and both the anxious ($r = .42, p < .001$) and avoidant ($r = .32, p < .001$) insecure attachment styles (Hypothesis 4).

Table 2

Correlations Among Main Study Variables

	1. ANX	2. AVD	3. RAS-M (trans.)	4. ATO (trans.)	5. SCI (trans.)	6. SI-R (trans.)
1.	1					
2.	.312**	1				
3.	-.342**	-.525**	1			
4.	.415**	.379**	-.285**	1		
5.	.415**	.317**	-.263**	.711**	1	
6.	.380**	.300**	-.301**	.577**	.762**	1

Note. ANX = Anxious Attachment Style; AVD = Avoidant Attachment Style; RAS-M = Relationship Assessment Scale-Modified; ATO = Attachment To Objects; SCI = Saving Cognitions Inventory; SI-R = Saving Inventory-Revised.

** $p < .001$

Mediation Analysis

To test my hypothetical model, I used Hayes’ PROCESS macro for SPSS for multiple mediation (Model 4), with bias-corrected and accelerated bootstrapping (5000 resamples) to obtain 95% Confidence Intervals [CI’s]. To improve normality, square root SI-R, square root SCI, reflected square root RAS-M, and inverse ATO scales were used.

Results of the mediation models are depicted in Figures 3 and 4 (below) for the anxious and avoidant attachment styles, respectively. The coefficients that were used to obtain estimates of the indirect effects (a*b product coefficients) can be found in Figures 3 and 4, while point estimates of the product of the ‘a’ and ‘b’ mediation paths, as well as the bias-corrected and accelerated confidence intervals based upon 5,000 bootstrap samples, for both simple and multiple mediator models are presented in Tables 4 and 5.

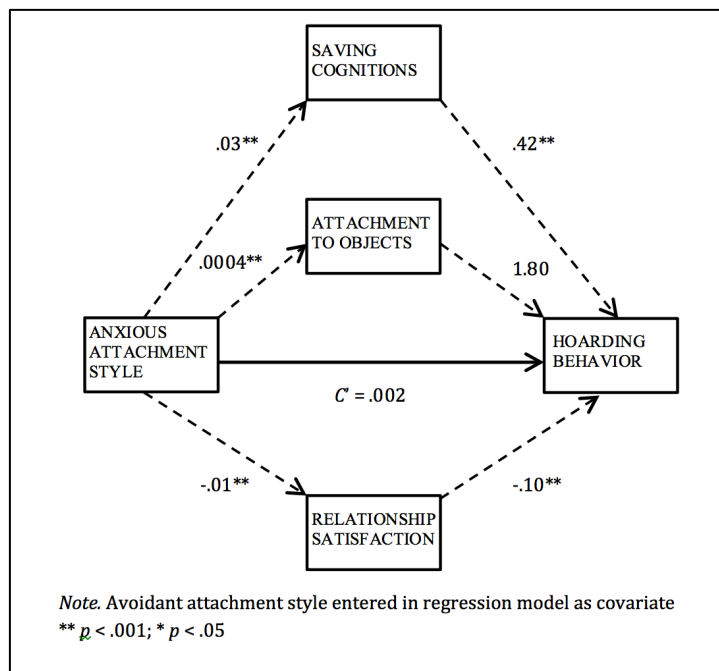


Figure 3. Multiple Mediation for Anxious Attachment Style: Statistical Diagram of All Paths and Unstandardized Coefficients, with Avoidant Attachment Style as Covariate.

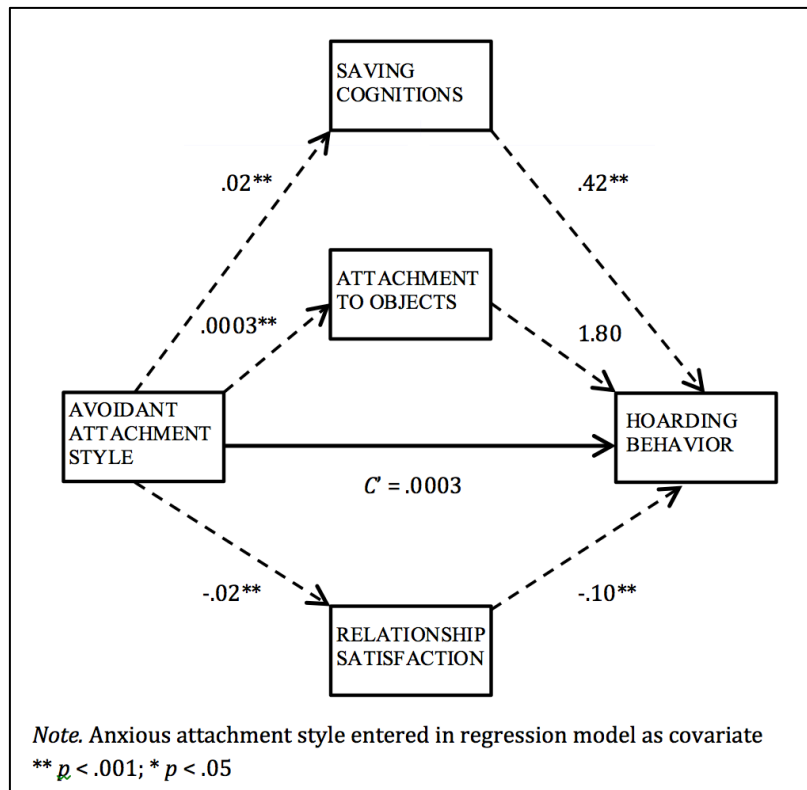


Figure 4. Multiple Mediation for Avoidant Attachment Style: Statistical Diagram of All Paths and Unstandardized Coefficients, with Anxious Attachment Style as Covariate.

Anxious Attachment Mediation Analyses

Simple indirect effects. The anxious-insecure attachment style influenced hoarding indirectly through its positive effect on saving cognitions ($a = .03$) and, individuals with greater amounts of saving cognitions reported more severe hoarding behavior ($b = .43$). A bias-corrected and accelerated bootstrap confidence interval for the indirect effect ($a*b = .012$) based on 5000 bootstrap samples was also entirely above zero [.010 to .014].

The anxious-insecure attachment style also influenced hoarding indirectly through its effect on attachment to objects ($a = .0004$), and individuals with greater object attachment reported much more severe hoarding behavior ($b = 20.93$). A bias-corrected and accelerated bootstrap confidence interval for the indirect effect ($a*b = .007$) based on 5000 bootstrap

samples did not include zero [.006 to .009].

Lastly, the anxious attachment style also influenced hoarding indirectly through its negative effect on relationship satisfaction ($a = -.01$), and individuals with reduced relationship satisfaction were more likely to engage in hoarding behaviors ($b = -.14$). A bias-corrected and accelerated bootstrap confidence interval for the indirect effect ($a*b = .001$) based on 5000 bootstrap samples was entirely above zero [.001 to .002].

Multiple indirect effects. When all three mediators were entered into the same regression model, anxious attachment style influenced hoarding behavior indirectly, through the joint mediation of relationship satisfaction, saving cognitions, and object attachment. A bias-corrected bootstrap confidence interval for the total indirect effect (.013) did not contain zero [.011 to .015]. Investigation of the three indirect effects comprising the total indirect effect revealed that only relationship satisfaction and saving cognitions were unique mediators insofar as the bootstrap confidence intervals for their indirect effect coefficients (.001 and .011, respectively) did not contain zero [.000 to .001] and [.009 to .0131], respectively. Contrast analyses revealed a significantly greater indirect effect through saving cognitions over both relationship satisfaction and attachment to objects. Yet, the contrast analysis between the indirect effects through attachment to objects and relationship satisfaction showed the difference in effect between these two indirect pathways was not reliably different from zero. Finally, there was no evidence of a direct effect of anxious attachment on hoarding behavior independent of its effect through relationship satisfaction, saving cognitions, and attachment to objects. When all mediating variables were entered into the regression equation simultaneously the bias-corrected bootstrap confidence interval for the direct effect ($c' = .002$) included zero [-.0001 to .004]. Thus, individuals with higher levels of anxious attachment are

more likely to report hoarding behavior primarily as a result of their higher levels of savings cognitions and lower levels of relationship satisfaction.

Avoidant Attachment Mediation Analyses

Simple indirect effects. The avoidant attachment style influenced hoarding indirectly through its positive effect on saving cognitions ($a = .02$) and, those individuals with greater saving cognitions were more influenced to engage in hoarding behaviors ($b = .43$). A bias-corrected and accelerated bootstrap confidence interval for the indirect effect ($a*b = .007$) based on 5000 bootstrap samples was entirely above zero [.006 to .009].

The avoidant-insecure attachment style also influenced hoarding indirectly through its effect on attachment to objects ($a = .0003$), and individuals with greater attachment report more severe hoarding behavior ($b = 20.93$). A bias-corrected and accelerated bootstrap confidence interval for the indirect effect ($a*b = .007$) based on 5000 bootstrap samples did not include zero [.005 to .008].

The avoidant attachment style also influenced hoarding indirectly through its negative effect on relationship satisfaction ($a = -.02$), and individuals with reduced relationship satisfaction were more influenced to engage in hoarding behaviours ($b = -.14$). A bias-corrected and accelerated bootstrap confidence interval for the indirect effect ($a*b = .003$) based on 5000 bootstrap samples was entirely above zero [.002 to .004].

Multiple indirect effects. When all three mediators were entered into the same regression model, avoidant attachment style influenced hoarding behavior indirectly through the joint mediation of relationship satisfaction, saving cognitions, and object attachment. A bias-corrected bootstrap confidence interval for the total indirect effect (.010) did not contain zero [.008 to .012]. As with the anxious attachment style, examination of the three indirect

effects that comprise the total indirect effect revealed that only relationship satisfaction and saving cognitions were unique mediators insofar as the bootstrap confidence intervals for their indirect effect coefficients (.002 and .007, respectively) did not contain zero [.001 to .003] and [.005 to .009], respectively. A contrast analysis revealed a significantly greater indirect effect through saving cognitions than for either relationship satisfaction or attachment to objects, and the coefficient for relationship satisfaction was reliably larger than the indirect effect for attachment to objects. There was no evidence of a direct effect of avoidant attachment on hoarding behavior, independent of its effect through relationship satisfaction, saving cognitions, and attachment to objects. When all mediating variables were simultaneously entered into the regression equation the bias- corrected bootstrap confidence interval for the direct effect ($c' = .0003$) included zero [-.002 to .002]. Thus, individuals with higher levels of avoidant attachment, like individuals with higher levels of anxious attachment, are more likely to report hoarding behavior as a result of their higher levels of savings cognitions and lower levels of relationship satisfaction. The indirect contribution of relationship satisfaction, however, was reliably larger than the indirect contribution of attachment to objects for the avoidant style, whereas the same contrast analysis between relationship satisfaction and attachment to objects for the anxious style was not reliably different from zero.

Table 3

Simple and Multiple Mediation of the Effects of Anxious-Insecure Attachment Style on Hoarding Behavior through Saving Cognitions, Attachment to Objects, and Relationship Satisfaction (N = 1341).

Mediator	<u>Product of Coefficients</u>	<u>Bootstrapping BCA 95% CI</u>	
	Point Estimate	Lower	Upper
Simple Indirect Effects			
Saving Cognitions	.012*	.010	.014
Attachment to Objects	.007*	.006	.009
Relationship Satisfaction	.001*	.001	.002
Multiple Indirect Effects			
Saving Cognitions	.011*	.009	.013
Attachment to Objects	.001	-.000	.002
Relationship Satisfaction	.001*	.000	.001
Contrasts			
Saving Cognitions Vs. Attachment to Objects	.011*	.013	.009
Saving Cognitions Vs. Relationship Satisfaction	.010*	.012	.009
Relationship Satisfaction Vs. Attachment to Objects	.000	-.001	.001

Note. Avoidant-Insecure Attachment Style entered as Covariate of *M* and *Y*.

BCA = Bias Corrected and Accelerated.

* $p < .05$

Table 4

Simple and Multiple Mediation of the Effects of Avoidant-Insecure Attachment Style on Hoarding Behavior through Saving Cognitions, Attachment to Objects, and Relationship Satisfaction (N = 1341).

Mediator	<u>Product of Coefficients</u>	<u>Bootstrapping BCA 95% CI</u>	
	Point Estimate	Lower	Upper
Simple Indirect Effects			
Saving Cognitions	.007*	.006	.009
Attachment to Objects	.007*	.005	.008
Relationship Satisfaction	.003*	.002	.004
Multiple Indirect Effects			
Saving Cognitions	.007*	.005	.009
Attachment to Objects	.001	-.000	.001
Relationship Satisfaction	.002*	.001	.003
Contrasts			
Saving Cognitions Vs. Attachment to Objects	.006*	.009	.005
Saving Cognitions Vs. Relationship Satisfaction	.005*	.007	.003
Relationship Satisfaction Vs. Attachment to Objects	.002*	.000	.003

Note. Anxious-Insecure Attachment Style entered as Covariate of *M* and *Y*.

BCA = Bias Corrected and Accelerated.

* $p < .05$

Moderated Regression

Avoidant attachment style was examined as a moderator of the relation between anxious attachment style and hoarding behaviour. Centered anxious attachment style and avoidant attachment style scores were entered in the first step of the regression analysis. In the second step of the regression analysis, the interaction term between anxious and avoidant attachment styles were entered. The addition of the product term did not reliably contribute unique variance in hoarding behaviour over and above the variance already contributed by the anxious and avoidant insecure attachment styles $\Delta R^2 = .00$, $\Delta F(1, 1337) = .06$, $p = .81$. That is, no additional variance in hoarding was accounted for by the effects of an interaction. Only the main effects of anxious and avoidant attachment styles reliably contributed to variance in hoarding behaviour. However, a statistically significant, within-person, interaction between the anxious and avoidant dimensions reliably contributed to small increases in variance (less than 1 %) when the outcome/criterion variable was one of the proposed mediators: saving cognitions, $\Delta R^2 = .003$, $\Delta F(1, 1337) = 4.62$, $p < .05$; attachment to objects, $\Delta R^2 = .006$, $\Delta F(1, 1337) = 11.30$, $p = .001$; and, relationship satisfaction, $\Delta R^2 = .009$, $\Delta F(1, 1337) = 16.73$, $p < .001$. Thus, there is no effect of an interaction between anxious and avoidant insecure attachment styles on hoarding severity, although the interaction of the two insecure styles of attachment does reliably explain unique variance when considering saving cognitions, attachment to objects, and relationship satisfaction as the outcomes of interest.

Separate simple slopes analyses were conducted on the SCI, ATO, and RAS scales to determine the extent that low versus high scores on the avoidant attachment dimension (calculated at 1 SD below and 1 SD above the mean) moderate the association between anxious attachment with saving cognitions, attachment to objects, and relationship satisfaction

(regressed separately, as individual outcome variables). Graphs of the effects of interaction for saving cognitions, attachment to objects, and relationship satisfaction are depicted below in Figures 5, 6, and 7, respectively. For saving cognitions, the unstandardized simple slope at 1 *SD* below the mean of avoidant attachment was .024 ($t = 9.56, p < .001$), and the unstandardized simple slope at 1 *SD* above the mean of avoidant attachment style was .032 ($t = 11.09, p < .001$). For attachment to objects, the unstandardized simple slope at 1 *SD* below the mean of avoidant attachment was .000 ($t = 13.26, p < .001$), and the unstandardized simple slope at 1 *SD* above the mean of avoidant attachment style was .000 ($t = 7.213, p < .001$). For relationship satisfaction, the unstandardized simple slope at 1*SD* below the mean of avoidant attachment was -.012 ($t = -8.93, p < .001$), and the unstandardized simple slope at 1 *SD* above the mean of avoidant attachment style was -.004 ($t = -2.58, p = .01$). Figures 5, 6, and 7 plot the simple slopes for the interactions.

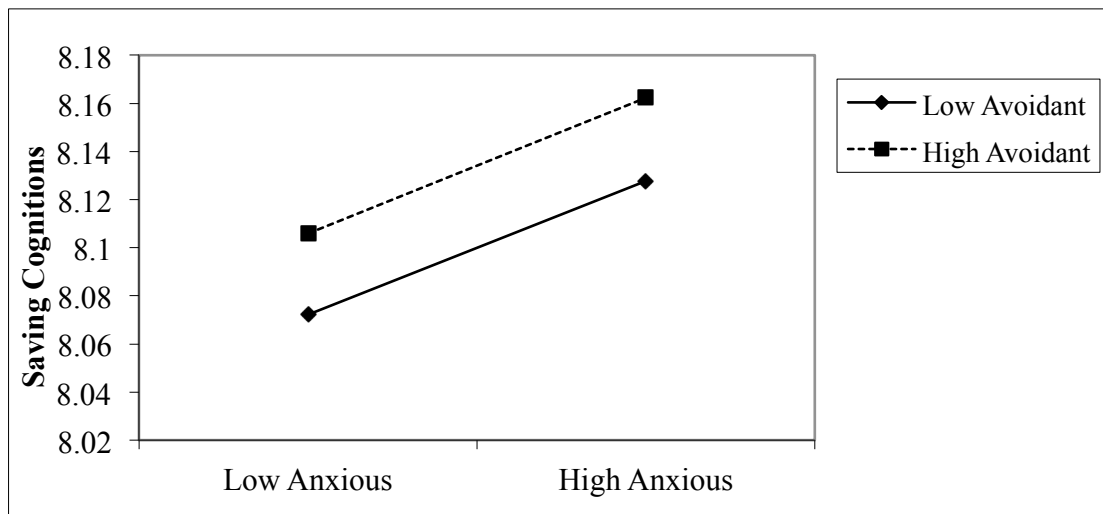


Figure 5. Simple Slopes for the Interaction of ANX and AVD on Saving Cognitions.

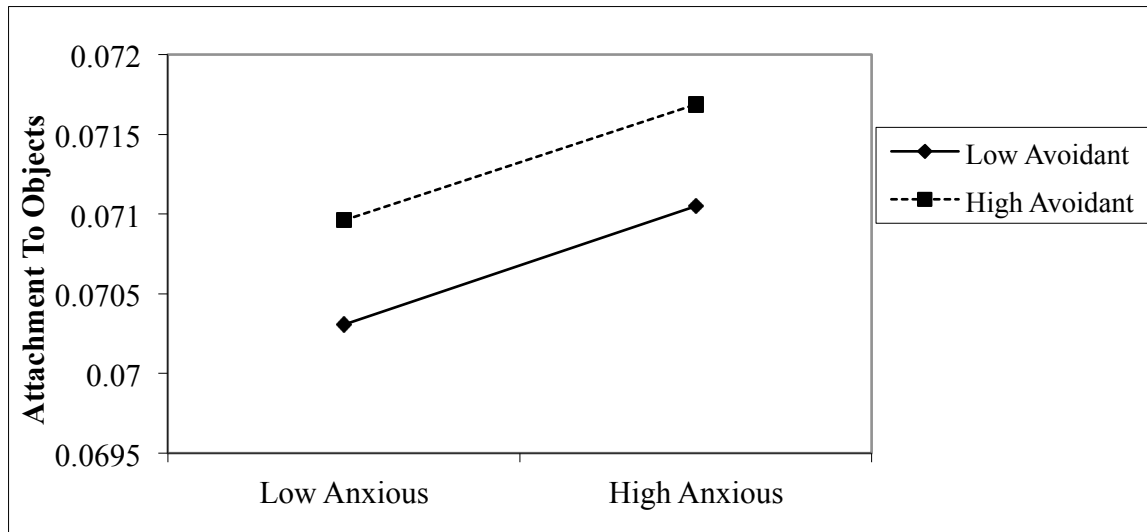


Figure 6. Simple Slopes for the Interaction of ANX and AVD on Attachment To Objects.

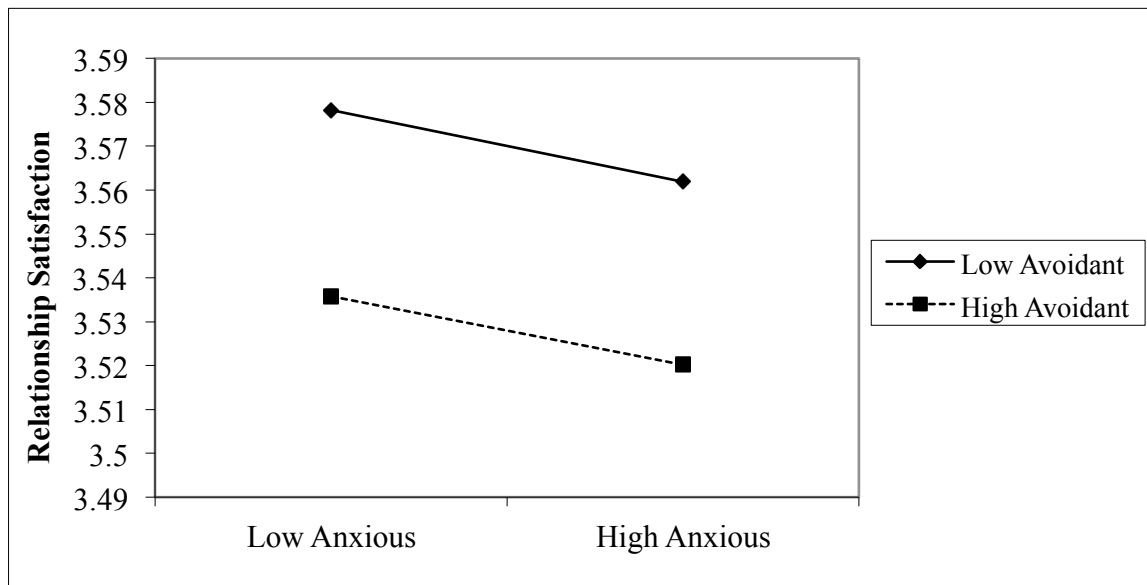


Figure 7. Simple Slopes for the Interaction of ANX and AVD on Relationship Satisfaction.

Exploratory Analyses

Due to the high correlation between the attachment to objects and saving cognitions measures, exploratory (non-hypothesized) correlation analyses were conducted, evaluating each sub-scale of the SCI, to ascertain whether the emotional attachment subscale of the SCI may be

measuring the same construct as the attachment to objects measure. High correlations were observed between the ATO scale and all of the SCI subscales. While the highest association was found between the ATO with the EA subscale of the SCI ($r = .71$), the responsibility and memory subscales also showed high correlations ($r = .65$, and $r = .61$, respectively) followed by the control subscale ($r = .52$).

Discussion

The intention behind the current study was to explore the associations between relationship-oriented processes (attachment security, relationship satisfaction) and hoarding related variables (behavior, cognition, feelings about objects). Specifically, I predicted that difficulties in attachment influence hoarding behavior and that this relationship is mediated by unsatisfying social relationships, object-oriented emotional compensation, and cognitive processes that jointly result in unhealthy attachment to objects.

Both the anxious and avoidant attachment styles demonstrated positive associations with hoarding (Hypothesis 1). Additionally, both styles negatively correlated with relationship satisfaction, and positively correlated with saving cognitions, and attachment to objects. (Hypotheses 2-4). For both styles of insecure attachment, the associations with hoarding behaviors were jointly mediated by relationship satisfaction, attachment to objects, and saving cognitions (Hypothesis 5). No interaction effect was observed for either the anxious or avoidant attachment styles with hoarding behavior, while small and meaningless, yet statistically significant, interactions were observed for each of the mediating variables (Hypothesis 6). Similarities and differences between anxious and avoidant attachment styles and their relationship with hoarding behavior, and the three mediators (saving cognitions, attachment to objects, and relationship satisfaction) are the focus of the remaining discussion.

Similarities and Differences Between Study Variables

Correlations. Both the anxious and avoidant attachment styles were positively associated with object attachment, saving cognitions, and hoarding behavior. Using a z-test for differences in correlation size, these differences were significant for saving cognitions ($z = 3.2$, $p = .001$) and for hoarding behavior ($z = 2.8$, $p < .01$), but not attachment to objects. This suggests that between the two styles of insecure attachment, anxious attachment behaviors increase hoarding-related cognitions and behaviors to a greater extent than avoidant attachment behavior. The lack of difference between the two attachment styles with respect to their correlations with emotional attachment to objects measure (the ATO) suggests that both insecure attachment styles equally predict insecure attachment to objects. Additionally, the positive correlation between insecure interpersonal attachment and insecure object attachment suggests that while hoarders may be attempting to fulfill security needs through developing emotional attachments with inanimate objects, their security needs do not appear to be fulfilled by their emotional attachment to objects. Evidence for emotional compensation would more likely be represented by demonstrations of secure attachment to objects vis-a-vis insecure attachment to people (i.e., an inverse correlation between insecure attachment to people and insecure attachment to objects), whereas results of the current study show that insecure interpersonal attachment predicts greater insecure attachment to objects, for both the anxious and avoidant interpersonal attachment styles.

As with prior research studies, both the anxious and avoidant attachment styles were negatively associated with relationship satisfaction. The negative correlation between the avoidant style and relationship satisfaction was greater in magnitude than the negative correlation between the anxious style and relationship satisfaction. Using the z-test differences

in correlation size, these differences were found to be significant ($z = 6.7, p < .001$). This suggests that between the two styles of insecure attachment, attachment avoidance behaviors reduce relationship satisfaction to a greater extent than anxious attachment behaviour. The tests of mediation and moderation were conducted to assess the relative contributions of saving cognitions, attachment to objects, and relationship satisfaction towards the development of hoarding symptomatology for individuals with insecure interpersonal attachment styles.

Test of mediation. Assessment of the mediational model revealed similarities for both attachment styles. Both were observed to indirectly influence hoarding behavior through the joint mediation of relationship satisfaction and saving cognitions, but not attachment to objects. The strength of the indirect effect owing to saving cognitions was considerably greater than either relationship satisfaction or object attachment for both styles of insecure attachment. Relationship satisfaction, emerged as a reliably stronger indirect effect than attachment to objects for the avoidant style, but not the anxious style. One clinical implication of this finding, is that avoidantly attached individuals may be additionally aided by interpersonal therapy techniques that help update ones negative mental model of “others” in combination with techniques aimed at restructuring cognitions about saving possessions.

The fact that attachment to objects no longer mediated the effect of attachment on hoarding once the other two mediators were included was unexpected. A possible explanation for this may lie in the limitations of the attachment to objects measure. Recall that the newly created attachment to objects scale showed a very strong and positive correlation with the saving cognitions scale ($r = .71, p < .001$). A correlation of this magnitude suggests that the two measures are, in large part, measuring the same underlying construct, and the effect of one measure may be masking the effect of the other (in this case the SCI may be masking the effect

of the ATO). Therefore, the current study remains inconclusive as to whether attachment to objects, as operationalized by the ATO, reliably accounts for an indirect effect between insecure attachment style and hoarding along with the observed indirect effects for saving cognitions and relationship satisfaction. Additional limitations of the study are discussed in later sections of the manuscript.

Test of moderation. The current study found no evidence of an interaction between the anxious and avoidant insecure attachment styles with hoarding behaviours. This implies that one's level of anxious or avoidant style, largely accounts for one's level of hoarding symptomatology, independent of the other. This finding also suggests that higher levels of both styles of insecure attachment within the same individual do not necessarily lead to more severity in hoarding behavior. Overall, higher levels of insecure attachment (whether anxious or avoidant) predict greater hoarding related affect, cognition, and behavior (main effects of anxious and avoidant attachment styles). One factor that may have precluded the effect of any interaction of attachment styles on hoarding behavior is that my sample was not a clinical one; participants in my study were not necessarily people seeking help for hoarding, but rather a community sample. An interaction effect may exist in clinical populations, an area for which future studies to investigate.

Exploratory analyses. The finding that ATO dropped out when SCI was included in the multiple mediation suggests that the ATO and the EA subscale of the SCI share common variance. To evaluate whether this was the reason for the high correlation, each SCI subscale was a) correlated with the total ATO scale, and b) hierarchically regressed on the ATO scale. The correlation matrix showed high correlations between the ATO scale with all the SCI subscales. The highest correlation was between the ATO and the emotional attachment

subscale, followed by the responsibility, and then memory subscales, with the lowest observed correlation on the control subscale. This suggests it is not only the EA subscale that shares common variance with the SCI, but in large part the entire SCI overlaps with the ATO scale. Results from the hierarchical regression on ATO using each SCI subscale as an independent predictor, revealed that 50% of the variance in ATO was owing to the EA subscale alone, with the addition of the other three subscales (control, memory, responsibility) only contributing an additional 3% variance in the ATO scale. One interpretation of these findings is that the SCI may be inadvertently or covertly measuring insecure attachment to objects. Support for this line of reasoning may come from comparing and contrasting the correlation of hoarding severity (assessed by the SI-R) with both the SCI and the ATO.

The correlation between the SCI and SI-R was exceptionally high ($r = .76$). The square of this value ($r^2 = .54$) indicates that approximately 54% of the variance in hoarding is explained by the SCI. The correlation coefficient between the ATO and SI-R ($r = .57$) when squared ($r^2 = .34$) indicates that 34% of the variance in hoarding is explained by the ATO. If the two constructs are in large part acting as a proxy for insecure attachment to objects, this suggests that the SCI captures 34% of the variance of insecure attachment objects, as well as something else (the 20% of additional variance the SCI has over the ATO in relation to hoarding severity as assessed by SI-R).

Limitations and Future Directions

The study has some limitations beyond the normal limitations of cross-sectional research, which as usual, cannot assert causation effects albeit the strong correlations observed between insecure attachment styles with each of the study's main variables. Future studies should include longitudinal designs to assert any causal influence of insecure attachment style

on relationship satisfaction and hoarding-related variables of affect, cognition, & behavior.

A key limitation for the interpretation of current study's results regards the validity of the newly created attachment to objects scale. Perhaps a better scale would not correlate as highly with savings cognitions. The ATO scale was designed to assess the construct of emotional attachment to objects, operationalized as the extent to which one derives a sense of safety and security from their belongings. Higher scores on the ATO scale indicate greater insecure (emotional) attachment to objects. In contrast, the SCI, was designed to assess the kinds of distorted thoughts (i.e., saving cognitions) hoarders have about discarding their belongings. The four subscales of the SCI evaluate distorted saving cognitions pertaining to control, responsibility, memory, and emotional attachment (EA) to belongings. Apriori, I conceptualized the emotional attachment (EA) subscale of the SCI to be a measure of distorted cognitions regarding one's emotional attachment to belongings to be a distinct construct from that of insecure attachment to objects, which I measured with the newly-derived ATO scale. That is, I used the SCI to assess the thoughts and feelings associated with an insecure style of attachment to objects, as opposed to one's level of insecure attachment to objects, which is what the ATO was intended to assess. However, given the high correlation between the ATO and SCI, it is unclear what each measure is actually assessing. Future studies can further elucidate similarities and differences between the ATO and SCI (and its subscales) by running tests of convergent and divergent validity on these measures.

Future studies could enhance the current understanding of the attachment to objects construct by using alternative measures of attachment to objects along with the SCI to explore whether all measures of attachment to objects correlate as strongly with the SCI as the ATO devised for my study. Comparing and contrasting alternative measures of object

attachment within the same study will allow for more accurate interpretations of insecure attachment to people versus their insecure attachment to objects. For example, if the current study substituted the words “attachment figure” with “my belongings” on the ECR, I would have been more easily able to interpret the positive correlation observed between the two styles of insecure interpersonal attachment with the one measure of insecure attachment to objects.

Another limitation to this study was the exclusion of control variables. Future studies should control for correlates of gender, depression, obsessive-compulsive disorder, and traumatic life events. The current study was intended to be a preliminary investigation as to whether an exploration of the attachment literature could provide leverage for our understanding of the factors underlying the development and maintenance of hoarding disorder. Now that a relationship has been confirmed, future studies should incorporate and control for variables known to moderate or otherwise affect hoarding tendencies.

Finally, to better understand the contribution of indirect effects observed in the current study’s parallel multiple mediation model, future studies may investigate any possible order of indirect effects of the mediation by testing the proposed model using a serial multiple mediator analysis. Closer inspection into the mechanisms underlying this newly proposed hypothetical structural model may benefit clinicians who have yet to find a more than 50% success rate when treating problems involving compulsive hoarding (Saxena & Maidment, 2004).

Conclusion

Both the anxious and avoidant styles of insecure attachment showed reliably positive associations with hoarding-related affect, cognition, and behavior, and negative associations with relationship satisfaction. This implies that attachment theory is important in the context of

hoarding symptomatology. Preliminary bivariate correlation analyses revealed that the total effect of an anxious-insecure interpersonal attachment style predicted hoarding severity to a greater extent than an avoidant-insecure interpersonal attachment style, and that for both the anxious and the avoidant types, the pathway between insecure attachment style and hoarding is an indirect one, primarily occurring through saving cognitions. Moreover, relationship satisfaction reliably predicted a unique indirect pathway by which insecure interpersonal attachment influences hoarding behavior. A greater indirect effect of relationship satisfaction emerged for the avoidant style as opposed to the anxious style, which may be related to the greater levels of relationship dissatisfaction reported by individuals high in avoidant-insecure attachment style when compared to individuals high in anxious insecure attachment style.

The results of this study imply that currently low rates of treatment efficacy for HD (using primarily CBT aimed at reducing urges to save or restructuring beliefs about discarding) may be improved by adopting empirically validated treatments drawn from the attachment therapy literatures. This is consistent with the current CBT treatment model for hoarding, which posits that early childhood experiences predispose certain at-risk/vulnerable individuals to the information processing deficits (i.e., negatively-biased ways of thinking about their attachment to objects) and executive functioning difficulties (i.e., difficulty with decisions about discarding and categorization/organization of belongings) that underlie the development and maintenance of hoarding behavior. Interpersonal therapy techniques shown to improve negative mental models of self and others may prove more effective at reducing hoarding symptomatology than techniques directed toward reducing the emotional attachment to objects, urges to save, clutter, and difficulty with discarding. Results of the mediation analysis suggest that individuals higher in avoidant-insecure interpersonal attachment style may be especially likely to benefit from

treatment aimed at updating negative mental models of others.

The current study was limited in its ability to infer causality and order of indirect effects in the mediation due to its cross-sectional design. While the parallel mediation established the indirect effect by which insecure attachment influenced hoarding, future studies will need to explore the model with serial mediation analysis to understand if the mediating variables exert their unique indirect effect in any particular order. Other limitations surround the validity of the ATO measure created for this study given its high correlation with the SCI ($r = .71$). Future studies should examine the convergent and divergent validity of the ATO and SCI measures in similar and different populations (i.e., clinical HD samples, older adults in community samples, both) while differentially controlling for known correlates such as gender, depression, OCD, and ADHD (and/or dementia in the case of older adults). This would answer questions pertaining to the validity of each instrument, and would help to clarify what each scale (and SCI subscale) is actually measuring. Additionally, future studies may try substituting the words “attachment figure” for “my belongings” on other attachment measures, such as the ECR, to better understand the psychological construct of emotional (i.e., insecure) attachment to objects, and to explore the newly introduced constructs of anxious and avoidant insecure attachment to objects.

References

- Associated Press. (1947, April 9). *Hermit's body buried under pile of debris in Fifth Ave. mansion*. The Milwaukee Sentinel. Retrieved from <http://news.google.com>
- Ainsworth, M. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.
- Ainsworth, M. D. S., & Wittig, B. A. (1969). Attachment and exploratory behavior of one-year-olds in a strange situation. In B. M. Foss (Ed.), *Determinants of infant behavior (Vol.4, pp. 111- 136)*. London: Methuen.
- Allison, C. J., Bartholomew, K., Mayseless, O., & Dutton, D. G. (2008). Love as a battlefield: Attachment and relationship dynamics in couples identified for male partner violence. *Journal of Family Issues, 29*(1), 125–150.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders: DSM-IV-TR*. (4th edition, text revision). Washington, DC: Author.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-V*. (5th ed.). Washington, D.C: American Psychiatric Association.
- Andersson, M., & Krebs, J. R. (1978). On the Evolution of Hoarding Behavior. *Animal Behavior, 26*, 707-711.
- Ayers, C. R., Saxena, S., Golshan, S., & Wetherell, J.L. (2010). Age of onset and clinical features of late life compulsive hoarding. *International Journal of Geriatric Psychiatry, 25*, 142-149
- Beck, L., & Madresh, E. A. (2008). Romantic partners and four-legged friends: An extension of attachment theory to relationships with pets, *Anthrozoos, 21*, 43-56. doi: 10.2752/089279308X274056

- Bhar, S., & Kyrios, M. (2005). Obsessions and compulsions are associated with different cognitive and mood factors. *Behavior Change*, 22(2), 81–96.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173–1182.
- Bartholomew, K. (1990). Avoidance of intimacy: An attachment perspective. *Journal of Social and Personal Relationships*, 7, 147-178.
- Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: A test of a four-category model. *Journal of Personality and Social Psychology*. 61 (2). 226-244.
DOI: 10.1037/0022-3514.61.2.226.
- Beck, L., & Madresh, E. A. (2008). Romantic partners and four-legged friends: an extension of attachment theory to relationships with pets. *Anthrozoös*, 21, 1 43- 56.
- Bowlby, J. (1969). *Attachment and loss: Vol. 1. Attachment*. New York: Basic Books. Bowlby, J. (1973). *Attachment and loss: Vol. 2. Separation*. New York: Basic Books. Bowlby, J. (1980). *Attachment and loss: Vol. 3. Loss, sadness and depression*. New York: Basic Books.
- Bowlby, J. (1988). *Secure base. Clinical applications of attachment theory*. London: Tavistock/Routledge.
- Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998a). Self-report measurement of adult attachment: An integrative overview. Dans J. A. Simpson & W. S. Rholes (Eds.), In *Attachment theory and close relationships* (pp. 46-76). New York: Guilford Press.
- Brennan, Wu, and Loev, J. (1998b). Adult romantic attachment and individual differences in attitudes toward physical contact in the context of adult romantic relationships. In J.

- Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 394-428). New York, NY: Guilford Press.
- Castrodale, L., Bellay, Y.M. Brown, C.M., Cantor, F.L., Gibbins, J.D. Headrick, M.L... Yu, D.T. (2010). General public health considerations for responding to animal hoarding cases. *Journal of Environmental Health, 72*(7), 14-18.
- Creasey, G., & Hesson-McInnis, M. (2001). Affective responses, cognitive appraisals, and conflict tactics in late adolescent romantic relationships: Associations with attachment orientations. *Journal of Counseling Psychology, 48*, 85–96.
- Cromer, K.R., Schmidt, N.B., & Murphy, D.L. (2007). Do traumatic events influence the clinical expression of compulsive hoarding? *Behavior Research and Therapy, 45*, 2581–2592.
- Cutrona, C. E. and Russell, D. (1987). The provisions of social relationships and adaptation to stress. In W. H. Jones & D. Perlman (Eds.), *Advances in personal relationships*. (Vol. 1, pp. 37-67). Greenwich, CT: JAI Press.
- Doron, G., & Kyrios, M. (2005). Obsessive-compulsive disorder: A review of possible specific internal representations within a broader cognitive theory. *Clinical Psychology Review, 25*, 415-432.
- Doron, G. Kyrios, M., & Moulding, R. (2007). Sensitive domains of self-concept in obsessive compulsive disorder (OCD): Further evidence for a multidimensionality model of OCD. *Journal of Anxiety Disorders, 21*, 433–444. DOI:10.1016/j.janxdis.2006.05.008
- Diagnostic and statistical manual of mental disorders, 5th ed. Arlington, VA: American Psychiatric Association, 2013.
- Dinkel, A., & Balck, F. (2005). An evaluation of the German relationship assessment scale. *Swiss Journal of Psychology, 64*, 259–263.

- Efron, B., & Tibshirani, R. (1993). *An introduction to the bootstrap*. New York: Chapman & Hall/CRC.
- Fairchild, A. J., & Finney, S. J. (2006). Investigating validity evidence for the experiences in close relationships-revised questionnaire. *Educational and Psychological Measurement*, *66*, 116-135.
- Feeney, J. A. (1999). Adult attachment, emotional control, and marital satisfaction. *Personal Relationships*, *6*, 169–185.
- Feeney, J. A., & Noller, P. (1990). Attachment style as a predictor of adult romantic relationships. *Journal of Personality and Social Psychology*, *58*, 281–291. DOI: 10.1037/0022-3514.58.2.281
- Frankenberg, F. R. (1984). Hoarding in anorexia nervosa. *British Journal of Medical Psychology*, *57*, 57–60.
- Frost, R. O., & Gross, R. C. (1993). The hoarding of possessions. *Behavior Research and Therapy*, *31*, 367–381.
- Frost, R. O., & Hartl, T. (1996). A cognitive–behavioral model of compulsive hoarding.. *Behavior Research and Therapy*, *34*(4), 341-350.
- Frost, R. O. Krause, M., & Steketee, G. (1996). Hoarding and Obsessive-Compulsive Symptoms. *Behavior Modification*, *20*, 116-132.
- Frost, R. O., & Steketee, G. (1997). Perfectionism in obsessive-compulsive disorder patients. *Behavior Research and Therapy*, *35*(4), 291–296.
- Frost, R. O., & Steketee, G. (1998). Hoarding: Clinical aspects and treatment strategies. In M. A. Jenike, L. Baer, & W. E. Minichiello (Eds.), *Obsessive–compulsive disorder: Practical management* (3rd edn., pp. 533–554) St. Louis, MO: Mosby Yearbook Medical.

- Frost, R.O., Steketee, G., & Williams, L. (2000a). Hoarding: A community health problem. *Health and Social Care in the Community*, 8, 229–234.
- Frost, R.O., Steketee, G., Williams, L., & Warren, R. (2000b). Mood, disability, and personality disorder symptoms in hoarding, obsessive-compulsive disorder, and control subjects. *Behavior, Research and Therapy*, 38, 1071–1082.
- Frost, R.O., Steketee, G., & Grisham, J. (2004). Measurement of compulsive hoarding: Saving Inventory-Revised. *Behavior, Research and Therapy*, 42, 1163–1182.
- Frost, R. O., Steketee, G., & Tolin, D.F. (2011). Comorbidity in hoarding disorder. *Depression and Anxiety*, 28, 876-884.
- Frost, R., Steketee, G., Tolin, D., & Renaud, S. (2008). Development and validation of the clutter image rating. *Journal of Psychopathology and Behavioral Assessment*, 30(3), 193–203.
DOI: 10.1007/s10862- 007-9068-7.
- Frost, R. O., Steketee, G., Williams, L., & Warren, R. (2000). Mood, disability, and personality disorder symptoms in hoarding, obsessive-compulsive disorder, and control subjects. *Behavior Research and Therapy*, 38, 1071–1082.
- Frost, R. O., & Tolin, D. F. (2008). *Compulsive hoarding*. In S. Taylor, J. S. Abramowitz, & D. McKay (Eds.), *Clinical handbook of obsessive-compulsive disorder and related problems*. Baltimore, MD: Johns Hopkins University Press.
- Frost, R. O., Tolin, D. F., Steketee, G., Fitch, K. E. & Selbo-Bruns, A. (2009). Excessive acquisition in hoarding. *Journal of Anxiety Disorders*, 23, 632–639.
doi:10.1016/j.janxdis.2009.01.013
- Furby, L. (1978). Possessions: Toward a theory of their meaning and function throughout the life cycle. In P.B. Yates (Ed.), *Life-span development and behavior* (Vol. 1, pp. 297-336).

New York: Academic Press.

- Gardner, W. L., Pickett, C. L., & Knowles, M. (2005). Social snacking and shielding: Using social symbols, selves, and surrogates in the service of belonging needs. In K. D. Williams, J. P. Forgas, & W. von Hippel (Eds.), *The social outcast: Ostracism, social exclusion, rejection, and bullying* (pp. 227-242). New York: Psychology Press.
- George, C., Kaplan, N., & Main, M. (1987). *The adult attachment interview*. Unpublished manuscript. University of California, Berkeley.
- Granqvist, P. (1998). Religiousness and perceived childhood attachment: On the question of compensation or correspondence. *Journal for the Scientific Study of Religion*, 37, 350-367
- Granqvist, P., & Hagekull, B. (1999). Religiousness and perceived childhood attachment: Profiling socialized correspondence and emotional compensation. *Journal for the Scientific Study of Religion*, 38 (2), 254-273.
- Granqvist, P., & Hagekull, B. (2000). Religiosity, adult attachment, and why “singles” are more religious. *International Journal for the Psychology of Religion*, 10, 111-123.
- Granqvist, P. (2002). Attachment and religiosity in adolescence: Cross-sectional and longitudinal evaluations. *Personality & Social Psychology Bulletin*, 28, 260-270.
- Granqvist, P. (2003). Attachment theory and religious conversions: A review and a resolution of the classic and contemporary paradigm chasm. *Review of Religious Research*, 45, 172-187.
- Granqvist, P., & Larsson, M. (2006). Contribution of religiousness in the prediction and interpretation of mystical experiences- Activation of religious schemas. *Journal of Psychology*, 140, 319–327.

- Greenberg, D., Witzum, E., & Levy, A. (1990). Hoarding as a psychiatric symptom. *Journal of Clinical Psychiatry, 51*, 417–421.
- Grisham, J. R., & Barlow, D. H. (2005). Compulsive Hoarding: Current Research and Theory. *Journal of Psychopathology and Behavioral Assessment, 27*, (1), 45-52. DOI: 10.1007/s10862-005-3265-z
- Grisham, J., Frost, R. O., Steketee, G., & Hood, S. (2006). Age of onset in compulsive hoarding. *Journal of Anxiety Disorders, 20*, 675e686
- Grisham, J. R., Frost, R. O., Steketee, G., Kim, H., Tarkoff, A., & Hood, S. (2009). Formation of attachment to possessions in compulsive hoarding. *Journal of Anxiety Disorders, 23*(3), 357–361. <http://dx.doi.org/10.1016/j.janxdis.2008.12.006>
- Grisham, J. R., Steketee, G., & Frost, R. O. (2008). Interpersonal Problems and Emotional Intelligence in Compulsive Hoarding. *Depression and Anxiety, 25*, E63-E71. DOI: 10.1002/da.20327.
- Grisham, J. R., Norberg, M. M., Williams, A. D., Certoma, S. P., Kadib, R., et al. (2010). Categorization and cognitive deficits in compulsive hoarding. *Behavior Research and Therapy, 48*(9), 866-872.
- 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. *Behavior Research and Therapy, 43*, 269–276.
- Hayes, A. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: The Guilford Press.
- Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology, 52*, 511-524.

- Hendrick, S. S., Dicke, A., & Hendrick, C. (1998). The Relationship Assessment Scale. *Journal of Social and Personal Relationships*, *15*, 137-142. DOI: 10.1177/0265407598151009
- Honig, W. K. (1991). Structure and Function of the Spatial Memory of Animals. In W. C. Abraham, M. Corballis, K.G. White (Eds.), *Memory Mechanisms, A Tribute to V. G. Goddard*, Hillsdale (pages). NJ: Lawrence Erlbaum.
- 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. *The American Journal of Psychiatry*, *166*, 1156–1161.
- Ivanov, V. Z., Mataix-Cols, D., Serlachius, E., Lichtenstein, P., Anckarsäter, H., Chang, Z. & Rück, C. (2013) Prevalence, comorbidity and heritability of hoarding symptoms in adolescence: A population based twin study in 15-year-olds, *PLoS ONE*, *8*, p. e69140. doi:10.1371/journal.pone.0069140.
- Johnson, T. P., Garrity, T. F. & Stallones, L. (1992). Psychometric evaluation of the Lexington Attachment to Pets Scale (LAPS). *Anthrozoös*, *5*(3), 160–175.
- Keefer, L. A., Landau, M. J., Rothschild, D. S. (2012). Compensation for close others' perceived unreliability. *Journal of Experimental Social Psychology*, *48*, 912-917. doi: 10.1016/j.jesp.2012.02.007
- Keelan, J. P. R., Dion, K. L., & Dion, K. K. (1994). Attachment style and heterosexual relationships among young adults: A short-term panel study. *Journal of Social and Personal Relationships*, *11*, 201–214. doi:10.1177/0265407594112003
- Kirkpatrick, L. A. (1997). A longitudinal study of changes in religious belief and behavior as a function of individual differences in adult attachment style. *Journal for the Scientific Study of Religion*, *36*, 207-217.

- Kirkpatrick, L. A. (1998). God as a substitute attachment figure: A longitudinal study of adult attachment style and religious change in college students.
- Kirkpatrick, L. A., & Davis, K. E. (1994). Attachment style, gender, and relationship stability: A longitudinal analysis. *Journal of Personality and Social Psychology*, 66, 502–512.
- Kirkpatrick, L. A., & Shaver, P. R. (1990). Attachment theory and religion: Childhood attachments, religious beliefs, and conversion. *Journal for the Scientific Study of Religion*, 29, 315-334.
- Kellett, S. (2007). Compulsive Hoarding: A Site-Security Model and Associated Psychological Treatment Strategies. *Clinical Psychology and Psychotherapy*, 14, 413– 427. doi: 10.1002/cpp.550
- Kellett, S., & Knight, K. (2003). Does the Concept of Object-Affect Fusion Refine Cognitive-Behavioural Theories of Hoarding? *Behavioural and Cognitive Psychotherapy*, 31, 457-461.
- Kobak, R. R., & Sceery, A. (1988). Attachment in late adolescence: Working models, affect regulation and representations of self and others. *Child Development*, 59, 135-146.
- Kolb, B. (1974). Prefrontal Lesions Alter Eating and Hoarding Behavior in Rats. *Physiology and Behavior*, 12, 507-511.
- Kress, V. E., Stargell, N. A., Zoldan, C. A., & Paylo, M. J. (2016). Hoarding Disorder: Diagnosis, Assessment, and Treatment. *Journal of Counseling & Development*, 94, 83-90.
- Lamb, M. E., Thompson, R. A., Gardner, W., & Charnov, E. L. (Eds.). (1985). *Infant-mother attachment: The origins and developmental significance of individual differences in strange situation behavior*. Hillsdale, NJ: LEA.

- Landau, D., Iervolino, A. C., Pertusa, A., Santo, S., Singh, S., Mataix-Cols, D. (2011). Stressful life events and material deprivation in hoarding disorder. *Journal of Anxiety Disorders*, 25, 192-202.
- Lanier, D. L., Estep, D. Q., & Dewsbury, D. A. (1974). Food Hoarding in Muroid Rodents. *Behavioral Biology*, 11, 177-187.
- Leckman, J.F., Grice, D. E., Boardman, J., Zhang, H., Vitale, A., Bondi, C., ... Pauls, D, L. (1997). *Symptoms of obsessive-compulsive disorder. American Journal of Psychiatry*, 154(7), 911-7.
- Lee, I. A., & Preacher, K. J. (2013, September). Calculation for the test of the difference between two dependent correlations with one variable in common [Computer software]. Available from <http://quantpsy.org>.
- Levy, M. B., & Davis, K. E. (1988). Love styles and attachment styles compared: Their relations to each other and to various relationship characteristics. *Journal of Personal and Social Relationships*, 5, 439–471.
- Li, T., & Chan, D.K.S. (2012). How anxious and avoidant attachment affect romantic relationship quality differently: A meta-analytic review. *European Journal of Social Psychology*, 42(4), 406–419. doi: 10.1002/ejsp.1842.
- Luchian, S. A., McNally, R. J., & Hooley, J. M. (2007). Cognitive aspects of non-clinical obsessive-compulsive hoarding. *Behaviour Research and Therapy*, 45, 1657–1662.
- Lucini, G., Monk, I., & Szlatenyi, C. (2009). *An analysis of fire incidents involving hoarded households*. Worcester, MA: Worcester Polytechnical Institute.
- Luchins, D., Goldman, M. B., Lieb, M., & Hanrahan, P. (1992). Repetitive behaviors in chronically institutionalized schizophrenic patients. *Schizophrenia Research*, 8, 119–123.

- Main, M., & Goldwyn, R. (1988). *An adult attachment classification system*. Unpublished manuscript, University of California, Department of Psychology, Berkeley.
- Mikulincer, M., & Shaver, P. R. (2007). *Measurement of attachment-related constructs in adulthood. Attachment in adulthood: structure, dynamics, and change*. Guilford Press: New York, 81–115.
- Molero, F. M., Shaver, P. R., Itziar, F., Arbiol, A., & Patricia, R. I. (2016). Long-term partners' relationship satisfaction and their perceptions of each other's attachment insecurities. *Personal Relationships, 23*(1), 159-171.
- 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. <http://dx.doi.org/10.1016/j.brat.2009.04.005>.
- Muroff, J., Steketee, G., Himle, J., & Frost, R. (2010). Delivery of internet treatment for compulsive hoarding (D.I.T.C.H.). *Behavior Research and Therapy, 48*, 79-85.
- Myhr, G., Sookman, D., & Pinard, G. (2004). Attachment security and parental bonding in adults with obsessive-compulsive disorder: A comparison with depressed outpatients and healthy controls. *Acta Psychiatrica Scandinavica, 109*, 447-456
- Neave, N., Jackson, R., Saxton, T., & Hönekopp, J. (2015). The influence of anthropomorphic tendencies on human hoarding behaviours. *Personality and Individual Differences, 72*, 214–219.
- Norris, J. I., Lambert, N. M., DeWall, C. N., & Fincham, F. D. (2012). Can't buy me love? Anxious attachment and materialistic values. *Personality and Individual Differences, 53*, 666–669.

- Nedelisky, A., & Steele, M. (2009). Attachment to people and to objects in obsessive-compulsive disorder: an exploratory comparison of hoarders and non-hoarders. *Attachment and Human Development, 11*, 365–383.
- Rasmussen, S. A., & Eisen, J. L. (1992). The epidemiology and clinical features of obsessive compulsive disorder. *Psychiatric Clinics of North America, 15*(4), 743– 758.
- Reid, J. M., Arnold, E., Rosen, S., Mason, G., Larson, M. J., Murphy, T. K., & Storch, E. A. (2011). Hoarding behaviours among nonclinical elderly adults: Correlations with hoarding cognitions, obsessive–compulsive symptoms, and measures of general psychopathology. *Journal of Anxiety Disorders, 25*, 1116-1122.
- Renshaw, K. D., McKnight, P., Caska, C.M., & Blaise, R. K. (2011). The utility of the relationship assessment scale in multiple types of relationships, *Journal of Social and Personal Relationships, 28*(4), 435-447. doi: 10.1177/0265407510377850
- Tabachnick, Barbara G. & Fidell, Linda S. *Using Multivariate Statistics*. Boston: Pearson Education, 2013. Sixth Edition.
- Roberts, N., & Noller, P. (1998). I. In J. A. Simpson, & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 317- 350). New York: Guilford Press.
- Rufer, M., Fricke, S., Moritz, S., Kloss, M., & Hand, I. (2006). Symptom dimensions in obsessive–compulsive disorder: Prediction of cognitive-behaviour therapy outcome. *Acta Psychiatrica Scandinavica, 113*, 440–446.
- San Francisco Task Force on Compulsive Hoarding. (2009). *Beyond overwhelmed: The impact of compulsive hoarding and cluttering in San Francisco and recommendations to reduce negative impacts and improve care*. Retrieved from <http://www.sfaa.org/pdf/hoarding-report-2009.pdf>

- Samuels J., Bienvenu III, O. J., Riddle, M.A., Cullen, B.A., Grados, M.A., Liang, K.Y., Hoehn-Saric, R., & Nestadt, G. (2002a). Hoarding in obsessive-compulsive disorder: results from a case-control study. *Behavior Research Therapy*, *40*, 517– 528.
- Samuels, J. F., Bienvenu, O. J., Grados, M. A., Cullen, B., Riddle, M. A., Liang, K. Y., et al. (2008). Prevalence and correlates of hoarding behavior in a community-based sample. *Behavior Research and Therapy*, *46*, 836–844.
- Samuels, J. F., Eaton, W. W., Bienvenu, O. J., Brown, C. H., Costa, P. T., Jr., & Nestadt, G. (2002b). Prevalence and correlates of personality disorders in a community sample. *British Journal of Psychiatry*, *180*, 536–542.
- Samuels, J.F., Shugart, Y.Y., Grados, M.A., Willour, V.L., Bienvenu, O.J., Greenberg, B.D., y Nestadt, G. (2007). Significant linkage to compulsive hoarding on chromosome 14 in families with obsessive-compulsive disorder: Results from the OCD Collaborative Genetics Study. *American Journal of Psychiatry*, *164*, 493– 499.
- Saxena, S., & Maidment, K. (2004). Treatment of compulsive hoarding. *Journal of Clinical Psychology*, *60*, 1143-1154. Seedat, S., & Stein, D. J. (2002). Hoarding in obsessive-compulsive disorder and related disorders: A preliminary report of 15 cases. *Psychiatry and Clinical Neurosciences*, *56*, 17-23
- Shafran, R., & Tallis, F. (1996). Obsessive-compulsive hoarding: A cognitive-behavioral approach. *Behavioural and Cognitive Psychotherapy*, *24*, 209-221. Shay, C. (2009). *The Neurobiology and Development of Compulsive Hoarding and Its Relationship to Obsessive-Compulsive Disorder*. Unpublished Manuscript.
- Sheppard, B., Chavira, D., Azzam, A., Grados, M. A., Uman, P., Garrido, H., & Mathews, C. (2010). Prevalence And Association With Hoarding Behaviors In Childhood- Onset

- OCD. *Depression and Anxiety*, 27, 667-674.
- Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and non-experimental studies: New procedures and recommendations. *Psychological Methods*, 7, 422– 445.
- Shytle, R. D., & Sheehan, K. H. (2004). Hoarding Assessment Scale. Unpublished manuscript.
- Simpson, J. A. (1990). Influence of attachment styles on romantic relationships. *Journal of Personality and Social Psychology*, 59, 971–980.
- Solomon, C., & Mataix-Cols, D. (2014). Hoarding Disorder. *The New England Journal of Medicine*, 370(21), 2023-2030.
- Steketee, G., Frost, R.O., & Kyrios, M. (2003). Cognitive aspects of compulsive hoarding. *Cognitive Therapy and Research*, 27, 463–479.
- Tran, S., & Simpson, J. A. (2009). Prorelationship maintenance behaviors: The joint roles of attachment and commitment. *Journal of Personality and Social Psychology*, 97, 685–698.10.1037/a0016418.
- Triebenbacher, S. L. (1997). Children's use of transitional objects: Parental attitudes and perceptions., *Child Psychiatry and Human Development*, 27, 221-230.
- Triebenbacher, S.L., & Tegano, D.W. (1993). Children's use of transitional objects during daily separations from significant caregivers. *Perceptual and Motor Skills*, 76, 89-90.
- Tolin, D.F., Fitch, K.E., Frost, R.O., & Steketee, G. (2010). Family informants' perceptions of insight in compulsive hoarding. *Cognitive Therapy and Research*, 34, 69–81.
- 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, 200-211.
- Tolin, D. F., Frost, R. O., Steketee, G., & Muroff, J. (2015). Cognitive behavioural therapy for hoarding disorder: a meta-analysis. *Depression and Anxiety*, 32(3), 158–166.

<http://dx.doi.org/10.1002/da.22327>.

- Tolin, D. F., Meunier, S. A., Frost, R. O., & Steketee, G. (2011). Hoarding among patients seeking treatment for anxiety disorders. *Journal of Anxiety Disorders, 25*, 43–48.
- Tolin, D. F., & Villavicencio, A. (2011). An exploration of economic reasoning in hoarding disorder patients. *Behavior, Research, & Therapy, 49*(12), 914–919.
- Varra, E. M., Pearlman, L. A., Brock, K. J., & Hodgson, S. T., (2008). Factor analysis of the trauma and attachment belief scale: A measure of cognitive schema disruption related to traumatic stress. *Journal of Psychological Trauma, 7*(3), 185-196. doi: 10.1080/19322880802266813
- Vaughn, M. J., & Matyastik Baier, M. E. (1999). Reliability and validity of the Relationship Assessment Scale. *American Journal of Family Therapy, 27*, 137 – 147.
- Warren, S.L., Huston, L., Egeland, B., & Sroufe, A. (1997). Child and adolescent anxiety disorders and early attachment. *Journal of the American Academy of Child and Adolescent Psychiatry, 36*, 637–644.
- West, M., Sheldon, A., & Reiffer, L. (1987). An approach to the delineation of adult attachment: Scale development and reliability. *Journal of Nervous & Mental Disease, 175*, 738–741.
- West, M., & Sheldon-Keller, A. (1992). The assessment of dimensions relevant to adult reciprocal attachment. *Canadian Journal of Psychiatry, 37*, 600–606.
- Winnicott, D.W. (1975). Transitional objects and transitional phenomena. In D.W. Winnicott (Ed.), *Through paediatrics to psychoanalysis* (pp. 229–242). New York: Basic Books.
- Wincze, J. P., Steketee, G., & Frost, R. O. (2007). Categorization in compulsive hoarding. *Behaviour Research and Therapy, 45*(1), 63–72.
- Winsberg, M. E., Cassic, K. S., & Koran. (1999). Hoarding in Obsessive-Compulsive Disorder:

A Report of 20 Cases. *Journal of Clinical Psychiatry*, 60, 591-597.

Wheaton, M. G. (2016). Understanding and treating hoarding disorder: A review of cognitive-behavioural models and treatment. *Journal of Obsessive-Compulsive and Related Disorders*, 9, 43-50. doi:10.1016/j.jocrd.2016.02.006

Wheaton, M., Cromer, K., LaSalle-Ricci, V. H., & Murphy, D. (2008). Characterizing the hoarding phenotype in individuals with OCD: Associations with comorbidity, severity and gender. *Journal of Anxiety Disorder*, 22, 243–252. doi:10.1016/j.janxdis.2007.01.01.

Woodhouse, S., Dykas, M. J., & Cassidy, J. (2009). Perceptions of secure base provision within the family. *Attachment & Human Development*, 11(1), 47–67.

Appendix A

Saving Inventory-Revised (SI-R – Modified Format; Frost, Steketee, & Grisham, 2004)

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. To what extent do you have difficulty throwing things away?
- ___ 2. How distressing do you find the task of throwing things away? (R)
- ___ 3. To what extent do you have so many things that your room(s) are cluttered?
- ___ 4. How often do you avoid trying to discard possessions because it is too stressful or time-consuming? (R)
- ___ 5. How distressed or uncomfortable would you feel if you could not acquire something you wanted?

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	Extreme

- ___ 6. 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.)
- ___ 7. How much does the clutter in your home interfere with your social, work or everyday functioning?
- ___ 8. How often do you feel compelled to acquire something you see (e.g., when

shopping or offered free things)?

- ___ 9. How strong is your urge to buy or acquire free things for which you have no immediate use?
- ___ 10. How much control do you have over your urges to acquire possessions?
- ___ 11. How often do you decide to keep things you do not need and have little space for?
- ___ 12. To what extent does clutter in your home cause you distress?
- ___ 13. To what extent does the clutter in your home cause you distress?
- ___ 14. How frequently does the clutter in your home prevent you from inviting people to visit?
- ___ 15. How often do you actually buy (or acquire for free) things for which you have no immediate use or need?
- ___ 16. How strong is your urge to save something you know you may never use?

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 much control do you have over your urges to save possessions?
- ___ 18. How much of your home is difficult to walk through because of clutter?
- ___ 19. How upset or distressed do you feel about your acquiring habits?
- ___ 20. To what extent does the clutter in your home prevent you from using parts of your home for their intended purpose?
- ___ 21. To what extent do you feel unable to control the clutter in your home?

____ 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.

____ 23. How often are you unable to discard a possession you would like to get rid of?

Note: (R) indicates reverse scoring.

The scale was used with permission from Dr. Randy Frost.

Appendix B
Saving Cognitions Inventory (SCI; Steketee, Frost, & Kyrios, 2003)

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.
2. _____ Throwing this away means wasting a valuable opportunity.
3. _____ Throwing away this possession is like throwing away a part of me.
4. _____ Saving this means I don't have to rely on my memory.
5. _____ It upsets me when someone throws something of mine away without my permission.
6. _____ Losing this possession is like losing a friend.
7. _____ If someone touches or uses this, I will lose it or lose track of it.
8. _____ Throwing some things away would feel like abandoning a loved one.
9. _____ Throwing this away means losing a part of my life.
10. _____ I see my belongings as extensions of myself; they are part of who I am.
11. _____ I am responsible for the well-being of this possession.
12. _____ If this possession may be of use to someone else, I am responsible for saving it for them.
13. _____ This possession is equivalent to the feelings I associate with it.
13. _____ My memory is so bad I must leave this in sight or I'll forget about it.
14. _____ I am responsible for finding a use for this possession.

15. _____ Throwing some things away would feel like part of me is dying.
16. _____ If I put this into a filing system, I'll forget about it completely.
17. _____ I like to maintain sole control over my things.
18. _____ I'm ashamed when I don't have something like this when I need it.
19. _____ I must remember something about this, and I can't if I throw this away.
20. _____ If I discard this without extracting all the important information from it, I will
lose something.
21. _____ This possession provides me with emotional comfort.
22. _____ I love some of my belongings the way I love some people.
23. _____ No one has the right to touch my possessions.

The scale was used with permission from Dr. Randy Frost.

Appendix C
Relationship Assessment Scale (RAS; Hendrick et al., 1998)

Instructions: Consider your current close relationships (e.g., romantic partners—if any, close friends, close family, etc...). Choose ONE person from this group that you feel closest to at this moment in time, and answer the following questions with that person in mind. Please choose or circle the number for each item that best answers each item for you using the scales provided for every question.

1. How well does your close person meet your needs?

1	2	3	4	5
Poorly		Average	Extremely well	

2. In general, how satisfied are you with your relationship?

1	2	3	4	5
Unsatisfied		Average	Extremely satisfied	

3. How good is your relationship compared to most?

1	2	3	4	5
Poor		Average	Excellent	

4. How often do you wish you hadn't gotten in this relationship?

1	2	3	4	5
Never		Average	Very often	

5. To what extent has your relationship met your original expectations?

1	2	3	4	5
Hardly at all		Average	Completely	

6. How much do you care about your close person?

1 2 3 4 5
 Not much Average Very much

7. How many problems are there in your relationship?

1 2 3 4 5
 Very few Average Very many

8. In general, I'm satisfied with my friendships.

1 2 3 4 5
 Very few Average Very many

Instructions: Next, answer the following questions considering your relationships IN GENERAL. Please circle the number for each item that best answers each item for you using the scales provided for every question.

9. In general, I'm satisfied with my relationship with my family.

1 2 3 4 5
 Very few Average Very many

10. In general, I'm satisfied with my relationship with co-workers and colleagues.

1 2 3 4 5
 Very few Average Very many

11. In general, I'm satisfied with my romantic relationship (only answer if they are in a current dating/married/committee romantic relationship)

1 2 3 4 5
 Very few Average Very many

The scale was used with permission from Dr. Susan Hendrick.

Appendix D
Experiences in Close Relationship Scale (Brennen, Clark, & Shaver, 1998)

The following statements concern how you feel in close relationships (i.e., with significant others including romantic partners, friends, family). This time we are interested in how you GENERALLY experience these relationships, NOT just in what is happening in a current relationship. Respond to each statement by indicating how much you agree or disagree with it. Click in the space provided for each question, using the following rating scale:

	1	2	3	4	5	6	7
Disagree				Neutral/ Mixed			Agree Strongly
	Strongly						

1. ___ I prefer not to show significant others how I feel deep down.
2. ___ I worry about being abandoned.
3. ___ I am very comfortable being close to significant others. (R)
4. ___ I worry a lot about my relationships.
5. ___ Just when my significant others start to get close to me I find myself pulling away.
6. ___ I worry that significant others won't care about me as much as I care about them.
7. ___ I get uncomfortable when significant others want to be very close.
8. ___ I worry a fair amount about losing my significant others.
9. ___ I don't feel comfortable opening up to significant others.
10. ___ I often wish that my significant others' feelings for me were as strong as my
 feelings for them.
11. ___ I want to get close to my significant others, but keep pulling back.
12. ___ I often want to merge completely with significant others, and this sometimes scares
 them away.
13. ___ I am nervous when significant others get too close to me.
14. ___ I worry about being alone.

15. ___ I feel comfortable sharing my private thoughts and feelings with my significant others. (R)
16. ___ My desire to be very close sometimes scares people away.
17. ___ I try to avoid getting too close to my significant others.
18. ___ I need a lot of reassurance that I am loved by my significant others.
19. ___ I find it relatively easy to get close to my significant others. (R)
20. ___ Sometimes I feel that I force my significant others to show more feeling, more commitment.
21. ___ I find it difficult to allow myself to depend on significant others.
22. ___ I do not often worry about being abandoned. (R)
23. ___ I prefer not to be too close to significant others.
24. ___ If I can't get my significant others to show interest in me, I get upset or angry.
25. ___ I tell my significant others just about everything. (R)
26. ___ I find that my significant others don't want to get as close as I would like.
27. ___ I usually discuss my problems and concerns with my significant others. (R)
28. ___ When I'm not involved in a relationship, I feel somewhat anxious and insecure.
29. ___ I feel comfortable depending on significant others. (R)
30. ___ I get frustrated when my significant others are not around as much as I would like.
31. ___ I don't mind asking significant others for comfort, advice, or help. (R)
32. ___ I get frustrated if significant others are not available when I need them.
33. ___ It helps to turn to my significant others in times of need. (R)
34. ___ When significant others disapprove of me, I feel really bad about myself.
35. ___ I turn to my significant others for many things, including comfort and reassurance. (R)

36. ___ I resent it when my significant others spend time away from me.

Note: (R) indicates reverse scoring.

The scale was used with permission from Dr. Kelly Brennen .

Appendix E
Attachment To Objects (ATO) scale

Instructions: Please rate the degree to which each statement about your belongings is true using the following scale:

1	2	3	4	5
Not at All		Somewhat		Very True

1. I have to have my belongings with me or nearby me when I'm upset.
2. When I'm upset, the most important thing is to be surrounded by my belongings.
3. I feel lost if I'm upset and my belongings are not around.
4. When I am anxious I desperately need to be close to my belongings.
5. The further I am from my belongings, the more insecure I feel.
6. Being with my belongings is my only source of security.
7. I do not know how I would manage if I had to reduce the number of belongings in my life.
8. I feel much more insecure or vulnerable when I am away from my belongings.
9. I feel comfortable going away from my belongings for a few days. (R)
10. I protest strongly when I have to leave my belongings.

Selected items used from the RAQ-A with permission from Dr. Anna Nedelinsky.

Appendix F
Demographic Questions

What is your gender?

- Male
- Female

What is your age group?

- Less than 18
- 18-20
- 20-25
- 25-30
- 30-35
- 35-40
- 40-45
- 45-50
- 50-55
- 55 and over

Country of residence within North America?

- Canada
- United States

What is your ethnicity?

- European/ Caucasian descent
- Aboriginal
- East Indian
- Asian
- Polynesian
- Middle Eastern
- African
- Central American
- South American
- Other

What is your current relationship status?

- Single, never married
- In relationship, but not living together
- Common-law
- Married
- Separated

- Divorced
- Widowed

What is your current living arrangement?

- At home with parents/ guardian/ family
- Live with roommate/ friend
- Live with partner
- Live alone
- Live on campus
- Other

What is your current employment status?

- Full-time work
- Part-time work
- Not working
- Student
- At home with children

Highest level of education completed?

- Some elementary
- Grade 8
- Some high school
- Some college/ university
- College diploma/ university degree
- Master's degree
- Ph. D or post-doctoral
- Other

What is your current income range?

- Less than 25,000
- 25,001 to 35,000
- 35,001 to 50,000
- 50,001 to 75,000
- 75,001 to 100,000
- 100,001 to 150,000
- 150,000

Appendix G Research Ethics Approval Documentation



**Research Ethics
and Compliance**
Office of the Vice-President (Research and International)

Human Ethics
208-194 Dafoe Road
Winnipeg, MB
Canada R3T 2N2
Phone +204-474-8880
Fax +204-269-7173

APPROVAL CERTIFICATE

January 23, 2013

TO: Kimberly J. Nozick
Principal Investigator (Advisor E. Johnson)

FROM: Brian Barth, Interim Chair
Psychology/Sociology Research Ethics Board (PSREB)

Re: Protocol #P2012:108
"An Attachment-based Model of Compulsive Hoarding"

Please be advised that your above-referenced protocol has received human ethics approval by the **Psychology/Sociology Research Ethics Board**, which is organized and operates according to the Tri-Council Policy Statement (2). It is the researcher's responsibility to comply with any copyright requirements. **This approval is valid for one year only.**

Any significant changes of the protocol and/or informed consent form should be reported to the Human Ethics Secretariat in advance of implementation of such changes.

Please note:

- If you have funds pending human ethics approval, the auditor requires that you submit a copy of this Approval Certificate to the Office of Research Services, fax 261-0325 - please include the name of the funding agency and your UM Project number. This must be faxed before your account can be accessed.
- if you have received multi-year funding for this research, responsibility lies with you to apply for and obtain Renewal Approval at the expiry of the initial one-year approval; otherwise the account will be locked.

The Research Quality Management Office may request to review research documentation from this project to demonstrate compliance with this approved protocol and the University of Manitoba Ethics of Research Involving Humans.

The Research Ethics Board requests a final report for your study (available at: http://umanitoba.ca/research/orec/ethics/human_ethics_REB_forms_guidelines.html) in order to be in compliance with Tri-Council Guidelines.

Appendix H
Research Ethics Amendment Approval



Human Ethics
208-194 Dafoe Road
Winnipeg, MB
Canada R3T 2N2
Phone +204-474-8880
Fax +204-269-7173

AMENDMENT APPROVAL

April 5, 2013

TO: Kimberly J. Nozick
Principal Investigator

FROM: Brian Barth, Interim Chair
Psychology/Sociology Research Ethics Board (PSREB)

Re: Protocol #P2012:108
"An Attachment-based Model of Compulsive Hoarding"

This will acknowledge your request dated March 20, 2013 requesting amendment to the above-noted protocol.

Approval is given for this amendment. Any further changes to the protocol must be reported to the Human Ethics Secretariat in advance of implementation.

Appendix I
Information and Consent Form 1

Research Project Title: An Attachment –Based Model of Compulsive Hoarding.

Principal Investigator:

Kimberly Nozick; M.A. Candidate, Clinical Psychology, University of Manitoba.

Email: umnozick@myumanitoba.ca

Research Supervisor:

Dr. Edward A. Johnson; Associate Professor, Department of Psychology,
University of Manitoba

Email: ed_johnson@umanitoba.ca

This "qualification" consent form, a copy of which you may save or print for your records and reference at this time (it will not be available later), is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to contact us. Please take the time to read this carefully and to understand any accompanying information.

Kimberly Nozick is conducting this study as her Master's Thesis, under the supervision of Dr. Edward Johnson. The purpose of this research is to examine how people's experiences in their interpersonal relationships may affect their relationships with the inanimate objects they possess. In order to be eligible to participate (and receive payment) in this mTurk HIT, you will be required to answer three qualification questions about your age, location of residence, and primary language. If your responses meet the study's pre-determined inclusion criteria then you will be allowed to participate in the HIT/study and the on-line survey will direct you, accordingly.

Your participation in this "qualification round" is completely voluntary. You will receive no payment for completing these three qualification questions. However, if your answers indicate that you are eligible for the study, you will be provided with a second document of informed consent, on which the type of questions to be asked and amounts of payments receivable (either 10 cents or \$1.00) will be further explained.

All of the answers you provide will be kept anonymous. We will not have access to your name and/or email as you complete the survey, but rather identify your survey completion by matching the code you enter into mTurk with the code assigned to you at the end of the survey. Payments will also be made using this survey code we provide you, whereby once the principal investigator (or one of her research assistants) confirms that the code in mTurk matches the code given at the end of the survey she will deposit the appropriate amount of funds into the Accounts Payable of the worker whose mTurk Worker ID is associated with that code. Further, any data associated with your code will be stored on a password-protected site at

www.qualtrics.com, and on password-protected computers affiliated with Dr. Johnson's lab. Only the principal investigator, her supervisor, and other authorized lab personnel (e.g., research assistants) will have access to your data. Data you will provide will not be stored on MTurk website as all survey information is sent directly from the participant to the survey platform and at no time registers on the mTurk website.

Once all the data are collected and analyzed for this project, we plan to share this information with the research community through seminars, conferences, presentations, and journal articles. When presenting the results of this research, we will not focus on individual participants' responses and will instead present the findings in summary form.

Summaries of the results of this study will be available once the data are analyzed and the projects are completed (anticipated to be toward the end of September, 2013). If you are interested in obtaining a copy please email the principal researcher, Kimberly Nozick, at umnozick@myumanitoba.ca with your name and preferred email address, requesting that she email the summary report to you. Your email address will be kept separate from your survey responses, thereby ensuring your name is not associated with your survey responses and maintaining your anonymity. You only need to provide this information if you wish to receive a summary of the results; you are not required to provide this information to receive financial compensation for your participation. You may also find this document on mTurk towards the end of September, 2013.

Clicking "I agree" at the bottom of this page indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. If you wish to withdraw, simply close the browser window at any time. If you do choose to withdraw from this study, we will destroy any data that you have provided and not include it in the analysis. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

The University of Manitoba may look at your research records to see that the research is being done in a safe and proper way.

This research has been approved by the Psychology/Sociology Research Ethics Board (P2012:108). If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Secretariat at 204-474-7122.

If you have read the information presented in this form and do not have any questions about this HIT/study, please click "I agree" when you are ready to begin. You should only click "I agree" if you agree to participate with full knowledge of the study presented to you in this information and consent form and of your own free will. We request that you be in a quiet place, when you have up to 60 minutes free, and where you can complete this survey on your

own and without interruption. We would appreciate it if you could turn off all instant messaging programs, as well as any other programs, currently running on your computer before continuing. Thank you for your consideration.

We strongly encourage you to save or print a copy of this consent form now for your records, as it will not be available later.

If you do not wish to participate in this study now, please click disagree below. Thank you for considering participating.

AGREE



DISAGREE



Explanation of Pre-Qualification Questions

Please answer the following three questions to determine your eligibility for this HIT/study. If you meet eligibility criteria you will be directed further.

Thank you for your honest answers.

Pre-Qualification Questions

- | | | | | |
|----|-----------------------------|----------|---------|---------|
| 1. | My country of residence is: | Canada | U.S.A | Other |
| 2. | My age in years is: | Under 18 | 18-65 | Over 65 |
| 3. | My most fluent language is: | English | Spanish | Other |

Appendix J
Participant Recruitment Script

Thank you for your interest. My name is Kimberly Nozick, and I'm a graduate student in the Department of Psychology, at the University of Manitoba (in Winnipeg, Canada). I'm recruiting participants to complete some questionnaires for my Master's thesis, in a study called "An Attachment-Based Model of Hoarding".

I am interested in your opinions, attitudes, thoughts, and feelings about various relationship patterns, with both animate and inanimate objects. For example, I am interested in knowing how satisfied you are in your close relationships and how attached you feel to the things that you own.

The questionnaire is completely anonymous. You will not be asked to identify yourself personally at any time, and any reporting of the results will be in the form of overall average ratings, for example, between males and females; or overall tendencies, such as correlations.

You will need to agree to another Informed Consent form (on next page) to be able to participate. Once you have agreed (by clicking agree at the bottom of the page), you will be randomly assigned a "survey code" number. This number will be made available to you once you complete the survey. At completion, you will be instructed to go back to the survey linkpage where you will enter the survey code number into the space provided, and by doing so payments will be deposited into your MTurk Worker Account.

The questionnaire is easy to do, and the questions are quickly answered. All questions are in multiple-choice format. The answers already there, you just select the number that fits you best. For example, one statement is "In general, how satisfied are you with your close person". You would rate this on a scale from 1 (unsatisfied) to 5 (extremely satisfied), depending on how satisfied you feel with your chosen close relationship.

I am being supervised for this thesis by Dr. Edward Johnson. If you have any questions please contact me directly at umnozick@myumanitoba.ca

Continue Survey



Exit Survey



Appendix K
Information and Consent Form 2

Research Project Title: An Attachment –Based Model of Compulsive Hoarding.

Principal Investigator: Kimberly Jill Nozick
M.A. Candidate, Clinical Psychology, University of Manitoba
Email: umnozick@myumanitoba.ca

Research Supervisor: Dr. Edward Johnson
Associate Professor, Department of Psychology, University of Manitoba
Email: ed_johnson@umanitoba.ca

This consent form, a copy of which you may save or print for your records and reference at this time (it will not be available later), is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to contact us. Please take the time to read this carefully and to understand any accompanying information.

Kimberly Nozick is conducting this study as her Master's Thesis, under the supervision of Dr. Edward Johnson. The purpose of this research is to examine how people's experiences in their interpersonal relationships may affect their relationships with the inanimate objects they possess.

Participants in this study will be asked to complete a battery of questionnaires in which they may be asked to complete as many as 153 questions or as few as 33 questions, depending on their answers to initial questions. Participants will be asked to rate their opinions, beliefs, attitudes and perceptions regarding several different topics, including experiences in close relationships, relationship satisfaction, and both the quality and quantity of different types of attachment relationships, including their attachment to objects and hoarding behavior. In addition, participants are asked to report demographic characteristics such as age, sex, ethnicity, citizenship, income, education, relationship status, and employment. It is not expected that participants will experience distress during the study, but in this unlikely event some questions lead to anxiety and/or worry a list of resources of where to obtain help, as well as more information about hoarding behavior, will be provided immediately following completion of the survey in the study debrief.

This is an on-line study that will be completed in one sitting, although participants will be directed to shorter or longer parts of the survey depending on the answers they provide. This is the information and consent form for all participants, regardless of how long it takes to complete the survey.

We estimate, that the at most, it will take no longer than 60 minutes to complete the survey. Participants will receive 10 cents if they are directed to exit the survey after completing the first

set of questions (on demographics and hoarding behavior; up to 33 items, approximately 10-15 minutes to complete). Participants who complete the longer set of questions (i.e., directed to complete the second set of questions) will receive financial compensation of \$1.00 (10 cents for first set of items and a 90 cents pre- approved bonus for answering the additional questions on the long form). Participants will receive payment by entering the survey code provided (following survey completion) into mTurk. The transfer of pre-deposited funds from the principal investigator's mTurk payment account into the mTurk worker's payment account will take place within 5 days of the time the survey code is entered into mTurk (provided that the code entered matches the code provided at the end of the survey).

Your participation in this study is completely voluntary. Should you choose to withdraw from the study at any point, or feel that you would rather leave some question(s) unanswered, you may do so without any penalty. This means that should you choose to withdraw at any point of the study, or feel that you would rather leave some question(s) unanswered, you will still receive the financial compensation (as described above). A potential benefit of participating, other than receiving a small financial reward, is that you will be helping to contribute to the expansion of knowledge in this research area; and, you might learn some things about yourself and your relationships to people and objects that you might not have been aware of before.

All of the answers you provide will be kept anonymous. We will not have access to your name and/or email as you complete the survey, but rather identify your survey completion by matching the code you enter into mTurk with the code assigned to you at the end of the survey. Payments will also be made using this survey code we provide you, whereby once the principal investigator (or one of her research assistants) confirms that the code in mTurk matches the code given at the end of the survey she will deposit the appropriate amount of funds into the Accounts Payable of the worker whose mTurk Worker ID is associated with that code. Further, any data associated with your code will be stored on a password-protected site at www.qualtrics.com, and on password-protected computers affiliated with Dr. Johnson's lab. Only the principal investigator, her supervisor, and other authorized lab personnel (e.g., research assistants) will have access to your data. Data you will provide will not be stored on mTurk website as all survey information is sent directly from the participant to the survey platform and at no time registers on the mTurk website.

Once all the data are collected and analyzed for this project, we plan to share this information with the research community through seminars, conferences, presentations, and journal articles. When presenting the results of this research, we will not focus on individual participants' responses and will instead present the findings in summary form.

Summaries of the results of this study will be available once the data are analyzed and the projects are completed (anticipated to be toward the end of September, 2013). If you are interested in obtaining a copy please email the principal researcher (umnozick@myumanitoba.ca) with your name and preferred email address, and request that she email the report to you. Your email address will be kept separate from your survey responses, thereby ensuring your name is not associated with your survey responses and maintaining your anonymity. You only need to provide this information if you wish to receive a summary of the results; you are not required to provide this information to receive financial compensation for

your participation. You may also find this document on mTurk towards the end of September, 2013.

Clicking “I agree” at the bottom of this page indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence. If you wish to withdraw, simply close the browser window at any time. If you do choose to withdraw from this study, we will destroy any data that you have provided and not include it in the analysis. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

The University of Manitoba may look at your research records to see that the research is being done in a safe and proper way.

This research has been approved by the Psychology/Sociology Research Ethics Board (P2012:108). If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Secretariat at 204- 474-7122.

If you have read the information presented in this form and do not have any questions about this study, please click “I agree” when you are ready to begin. You should only click “I agree” if you agree to participate with full knowledge of the study presented to you in this information and consent form and of your own free will. We suggest that you be in a quiet place, when you have up to 60 minutes free, and where you can complete this survey on your own and without interruption. We would appreciate it if you could turn off all instant messaging programs, as well as any other programs, currently running on your computer before continuing. Thank you for your consideration.

We strongly encourage you to save or print a copy of this consent form now for your records, as it will not be available later.

If you do not wish to participate in this study now, please close your web browser or click disagree below. Thank you for considering participating.

AGREE

DISAGREE