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# Moral Reasoning and Moral Emotions Linking Hoarding and Scrupulosity

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**Moral Reasoning and Moral Emotions Linking Hoarding and Scrupulosity**

by

Keith Lit

A Dissertation Presented to the College of Psychology  
of Nova Southeastern University  
in Partial Fulfillment of the Requirements  
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**Approval Page**

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## **ABSTRACT**

Hoarding and scrupulous OCD are part of the Obsessive-Compulsive and Related Disorders, which are characterized by obsessional preoccupation and ritualistic behavior. Prior research has found a statistical relationship between hoarding and scrupulosity after controlling for these common factors, suggesting the existence of other features shared by these two disorders. Clinical accounts and empirical research of hoarding and scrupulosity suggest three such shared factors: a tendency to experience intense guilt and shame, rigid moralistic thinking, and general cognitive rigidity. However, results of the current study show that, although both hoarding and scrupulosity were related to cognitive rigidity and a tendency to experience guilt and shame, they are not associated with rigid moralistic thinking. Instead, beliefs about the importance of emotions as moral guides were related to both disorders. These results are interpreted in terms of dual-process theories of moral reasoning. Additionally, implications for the conceptualization and treatment of hoarding and scrupulosity are discussed.

## CHAPTER I

### Statement of the Problem

The clinical disorders collectively known as the Obsessive-Compulsive and Related Disorders (OCDs; American Psychiatric Association, 2013) are characterized by anxiety, obsessional preoccupation, and ritualistic behavior (Steketee, 2012). However, two particular conditions from within this category – hoarding disorder (HD) and scrupulosity – have demonstrated a significant statistical relationship above and beyond these common features (Rowley, Timpano, & Schmidt, 2011). This relationship is surprising given the dissimilarity between these disorders in terms of clinical phenomenology: hoarding involves difficulty discarding possessions and the accumulation of clutter that significantly impacts living spaces (Frost & Hartl, 1996), whereas scrupulosity is a form of obsessive-compulsive disorder (OCD) featuring fears about religion, morality, and sin (Nelson, Abramowitz, Whiteside, & Deacon, 2006). Both disorders are difficult to treat (Mataix-Cols, Marks, Greist, Kobak, & Baer, 2002; Tolin, Frost, Steketee, & Muroff, 2015), and specialized forms of cognitive-behavioral therapy (CBT) for each condition have been developed (Huppert & Siev, 2010; Steketee & Frost, 2013). One possible way to enhance these treatments is to explain the surprising statistical relationship between hoarding and scrupulosity by identifying features that are common to both disorders and integrating treatment strategies that address these shared features.

An obvious starting point for identifying such shared features is the prominence of guilt and shame in clinical and theoretical descriptions of both hoarding and scrupulosity (Abramowitz & Jacoby, 2014; Frost & Hartl, 1996; Steketee & Frost, 2013). In hoarding, guilt and shame often result from the perceived immorality of wasting possessions (Frost, Steketee, & Tolin, 2012). In scrupulosity, these emotions may be even more prominent, as an obsession with potential moral transgressions is one of the defining features of the disorder (Nelson et al., 2006). Therefore, it is possible that being prone to intense experiences of guilt and shame is one of the factors that connect hoarding and scrupulosity. Additionally, it follows that hoarding and scrupulosity may also be related to a particular style of moral reasoning that leads to these overwhelming emotions. In fact, individuals with these conditions and related disorders have been described as morally rigid, prone to dichotomous thinking about right and wrong, and obsessed with moral rules (Frost & Steketee, 2010; Gangemi, Mancini, & van den Hout, 2007; Mancini & Gangemi, 2015; Whitton, Henry, & Grisham, 2014). Moreover, this rigid thinking about matters of morality may be embedded in a larger pattern of cognitive rigidity, which is suggested by the prevalence of obsessive-compulsive personality traits in individuals with both hoarding and scrupulosity (Mataix - Cols, Baer, Rauch, & Jenike, 2000; Siev, Steketee, Fama, & Wilhelm, 2011).

The current investigation was designed to assess the extent to which these three factors – guilt and shame, rigid moralistic thinking, and cognitive rigidity – explain the relationship between hoarding and scrupulosity. It begins with a

replication of previous research findings showing a robust relationship between these two clinical conditions, and proceeds to examine whether the three hypothesized shared features account for this statistical relationship. Finally, the explanation of the hoarding-scrupulosity relationship is further refined through post-hoc, exploratory analyses of other aspects of moral reasoning.

## CHAPTER II

### Review of the Literature

This chapter begins by reviewing the clinical, theoretical, and empirical literature on the phenomenology, cognitive-behavioral models, and treatment of hoarding and scrupulosity. After establishing this overview of foundational knowledge, specific attention is paid to findings linking the two disorders and to the evidence suggesting that guilt and shame, moralistic thinking, and cognitive rigidity might explain this link.

### *Hoarding Disorder*

#### *Clinical Features*

HD is characterized by difficulties discarding possessions, clutter that interferes with living spaces, and clinically significant emotional distress or functional impairment (Frost & Hartl, 1996; Tolin, 2011). Excessive acquisition of objects, though not required for a diagnosis of HD, occurs alongside difficulty discarding in most cases (Frost, Tolin, Steketee, Fitch, & Selbo-Bruns, 2009). The types of possessions that are acquired and saved in pathological hoarding vary by individual and are often similar to the types of items saved by healthy individuals (Frost, Hartl, Christian, & Williams, 1995). Common examples include food, books, newspapers, photographs, clothing, or documents. However, hoarding is distinguished from normative saving by a number of features, including the quantity of possessions saved, the intensity of emotional distress when facing a decision to

discard, and the level of clutter caused by compulsive saving (Frost & Hartl, 1996; Frost et al., 1995).

Common reasons that people report for hoarding possessions include a sense of responsibility for their belongings, the use of objects as visual reminders to compensate for poor memory abilities, a strong desire to exert control over possessions, and the belief that wasting objects is morally wrong (Steketee, Frost, & Kyrios, 2003). People who hoard also report intense emotional attachments to objects, including beliefs that their possessions feel like extensions of themselves and that discarding objects would feel like losing a part of their lives (Steketee et al., 2003). When faced with decisions about discarding possessions, people who hoard experience a variety of negative emotions including anxiety, anger, sadness, disgust, regret, guilt, and shame (Frost & Hartl, 1996; Frost et al., 1995; Frost & Steketee, 2010; Steketee & Frost, 2013). Conversely, acquisition of new possessions results in temporary relief from negative emotions and short-term exhilaration or heightened self-esteem (L. M. Lawrence, Ciorciari, & Kyrios, 2014).

Beyond the primary symptoms of acquisition, difficulty discarding, clutter, and distress, associated features of HD including perfectionism (Frost & Gross, 1993; Steketee & Frost, 2003), indecisiveness (Fitch & Cogle, 2013), anxiety sensitivity (Coles, Frost, Heimberg, & Steketee, 2003) and avoidant and obsessive-compulsive personality traits (Mataix - Cols et al., 2000). Individuals who hoard also frequently demonstrate poor insight regarding their hoarding beliefs and behaviors, with one

study finding that more than 50% were described by family members as having poor to delusional insight into their disorder (Tolin, Fitch, Frost, & Steketee, 2010).

The effects of HD include poor physical and mental health, financial hardship (Tolin, Frost, Steketee, Gray, & Fitch, 2008) and impaired social relationships (Ayers, Najmi, Howard, & Maddox, 2014). Family functioning is also negatively impacted and adult children of individuals who hoard report increased anxiety, depression, and social impairment (Park, 2015). Beyond individuals and families, hoarding places a significant burden on communal systems due to lost work productivity, high levels of mental health and other medical service utilization, and involvement by social service agencies (Tolin et al., 2008).

### ***Diagnosis of HD***

Prior to the early 1990s, hoarding was generally thought of as a manifestation of OCD or Obsessive-Compulsive Personality Disorder (OCDP; Frost & Steketee, 2014). Following the publication of two seminal papers on hoarding (Frost & Gross, 1993; Frost & Hartl, 1996), many researchers began to critique this approach and to conceptualize hoarding as a unique syndrome. Since that time, empirical evidence supporting this conceptualization has come from multiple lines of research in the areas of psychopathology, epidemiology, genetics, neuroimaging, neuropsychology, personality, and treatment (Frost & Steketee, 2014; Mataix-Cols et al., 2010). As a result, the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders, (DSM-5; American Psychiatric Association, 2013) includes Hoarding Disorder as a

separate diagnosis from OCD, with both diagnoses included in the superordinate category of Obsessive-Compulsive and Related Disorders.

There are six DSM-5 diagnostic criteria for HD. Criteria A, B, and C address the primary symptoms of difficulty discarding, the perceived need to save possessions and distress associated with discarding, and clutter that interferes with living areas. Criteria D addresses functional impairment, and Criteria E and F rule out medical conditions and other mental disorders as causes of the hoarding behavior. A “With excessive acquisition” specifier is optional, and research suggests this specifier is appropriate in almost 90% of cases (Frost et al., 2009). Finally, a specifier is given to describe insight as either good or fair, poor, or absent or delusional.

### ***Comorbidity***

Approximately three quarters of individuals with HD have comorbid mental disorders (American Psychiatric Association, 2013), with depressive and anxiety disorders being the most common (Frost, Steketee, & Tolin, 2011; Tolin et al., 2012). People who hoard also frequently display symptoms of OCD, but estimates of the prevalence of OCD in the hoarding population have been complicated by measurement and recruitment issues related to the historical connection between the two disorders (Wheaton & Van Meter, 2014). Another common comorbidity is Attention-Deficit/Hyperactivity Disorder (ADHD), with up to 30% of individuals who hoard reporting a formal diagnosis or a history of symptoms, particularly of inattention (Grisham, Brown, Savage, Steketee, & Barlow, 2007). Additionally, trauma and posttraumatic stress disorder have been strongly associated with hoarding,



and many people who hoard report a connection between traumatic life events and the onset of hoarding symptoms (Landau et al., 2011).

### ***Cognitive-Behavioral Models of HD***

Frost and Hartl (1996) first elaborated a cognitive-behavioral model of hoarding based on their extensive clinical experience and a handful of preliminary studies. They identified four primary components in their model: information processing deficits, dysfunctional beliefs, emotional attachments, and behavioral avoidance. Subsequent empirical studies have provided support for a number of their propositions and continue to expand the scope of the model to include additional etiological and maintenance factors (Steketee et al., 2003; Tolin, 2011; Woody, Kellman-McFarlane, & Welsted, 2014).

In the current model (see Figure 1), problems with acquiring and discarding possessions are hypothesized to originate in psychosocial vulnerability factors and biologically based information processing deficits (Steketee & Frost, 2013). Psychosocial factors include past experiences and learning history, negative core beliefs, comorbid depression and anxiety, and personality traits of perfectionism, anxiety sensitivity, and dependency. These factors contribute to the development of dysfunctional beliefs about identity, responsibility, memory, and control over personal possessions, which in turn result in negative emotional reactions such as sadness, anxiety, guilt, shame, and anger when possessions are discarded (Steketee & Frost, 2013). The termination or avoidance of these unpleasant emotions negatively reinforces saving. Similarly, dysfunctional beliefs about possessions lead to positive

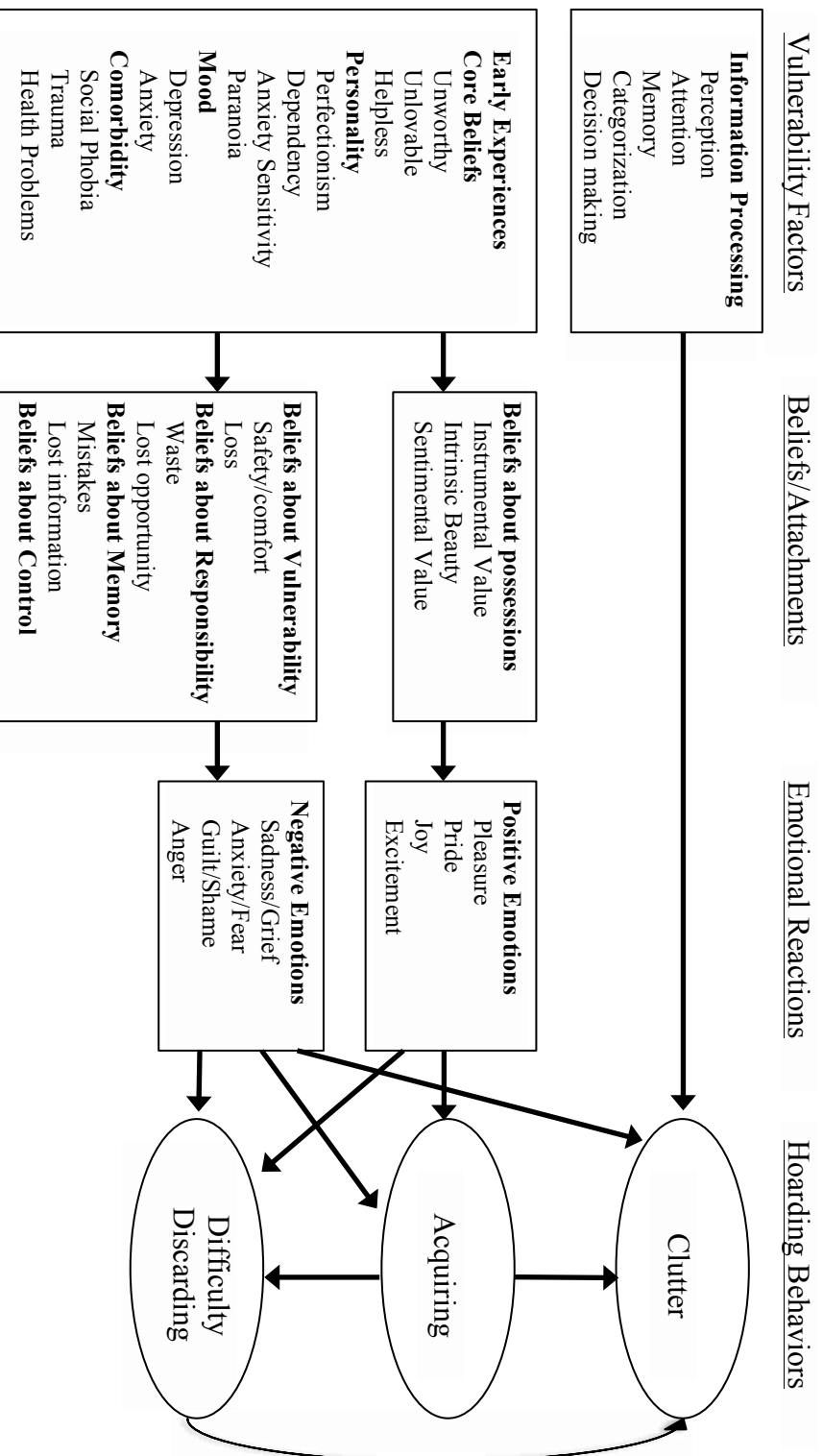


Figure 1. Cognitive-behavioral model of hoarding disorder (Steketee & Frost, 2013)

emotions when new objects are obtained, and this positive reinforcement creates a cycle of compulsive acquisition (Kyrios, 2013). The accumulation of clutter and the chaotic appearance of living spaces are exacerbated by information processing deficits in attention, memory, decision-making, and categorization, which add to the difficulty of discarding and inhibit the effective organization of possessions (Timpano, Smith, Yang, & Çek, 2014).

The hypotheses of this model have largely been supported in the research literature, with the most commonly examined subjects being avoidance, dysfunctional beliefs, emotional attachments, and information processing deficits (Tolin, 2011). However, in relation to the current study, it is important to note that guilt and shame, despite being included in the model, are almost never measured in studies of hoarding (Weingarden & Renshaw, 2015). Similarly, although guilt and shame are considered *moral emotions* (Tangney & Dearing, 2003) and beliefs about responsibility presumably relate to moral beliefs, no details about the process by which these beliefs influence emotions are specified in the model.

### ***Treatment for HD***

Just as the assessment and diagnosis of compulsive hoarding were previously conceptualized within an OCD framework, treatment for individuals presenting with hoarding difficulties has historically been conducted using approaches designed for OCD, especially ERP and other forms of CBT (Steketee, 2014). However, outcome studies investigating these treatments indicated that individuals with hoarding symptoms benefit significantly less than OCD patients, suggesting the need

specialized treatment specific to hoarding (Bloch et al., 2014). To meet this need, hoarding specialists have developed a multi-component CBT approach that has been disseminated through therapist guides for individual (Steketee & Frost, 2007, 2013) and group formats (Muroff, Underwood, & Steketee, 2014) and through a self-help book (Tolin, Frost, & Steketee, 2007). These CBT treatments combine motivational interviewing strategies (Miller & Rollnick, 2012) with cognitive therapy techniques to target hoarding related beliefs, skills training to address decision making and other information processing difficulties, and exposure to acquisition cues and to discarding. Although only a small number of empirical investigations on these treatments have been conducted, a recent meta-analysis found large effect sizes for overall post-treatment improvement and specifically for difficulty discarding, Hedge's  $g = .82$  and  $.89$ , respectively (Tolin et al., 2015). However, the smallest effects across studies were found for functional impairment, Hedge's  $g = .52$ , and less than half of participants achieved reliable and clinically significant change (Tolin et al., 2015). These relatively low response rates indicate a significant need for improvements in treatment strategies and the models on which they are based. An increased understanding of the role of moral reasoning, guilt, and shame in hoarding may contribute to such improvements.

### *Scrupulosity*

#### *Clinical Features*

Scrupulous OCD is characterized by obsessive fears and compulsions with religious or moral themes (Abramowitz & Jacoby, 2014; Nelson et al., 2006).

Common scrupulous obsessions include intrusive thoughts or images that are judged as sacrilegious, fears about having unintentionally violated religious laws, doubts about the sufficiency of one's piety or morality, or fears that religious rituals have not been completely properly (Abramowitz & Jacoby, 2014). Examples of compulsions that accompany these obsessions are excessive confession or prayer, mental acts meant to neutralize sinful thoughts, and checking or washing to avoid spiritual or moral contamination (Siev, Baer, & Minichiello, 2011). In addition to engaging in compulsions, scrupulous individuals often avoid situations, people, or places that elicit their obsessions such as places of worship, objects and texts related to religion, or materials perceived as sinful (Abramowitz & Jacoby, 2014). In some presentations of scrupulosity, the topography of symptoms overlaps with common subtypes of OCD, but the ultimate feared consequences of obsessions are religious or moral nature (Huppert, Siev, & Kushner, 2007). For example, a person with contamination OCD might wash their hands repeatedly out of a fear of disease and death, whereas a person with scrupulous OCD might wash their hands repeatedly to prevent divine retribution for praying without being sufficiently clean.

Scrupulosity can be distinguished from normative religious practice in a number of ways. Although the specific content of scrupulous obsessions may or may not be congruent with conventional religious beliefs, scrupulous individuals react with intense guilt and anxiety to transgressions perceived as normal and easily pardonable by others within their religious community (Abramowitz & Jacoby, 2014). Similarly, scrupulous compulsions usually go far beyond the prescriptions of

religious law or normal practice in terms of the frequency or effort at perfection with which they are performed (Himle, Chatters, Taylor, & Nguyen, 2011).

Compared to individuals with other forms of OCD, scrupulous OCD sufferers do not appear to have more severe symptoms or to seek out psychotherapy treatment less frequently (Siev, Baer, et al., 2011). However, scrupulosity has been associated with other clinical characteristics that may present barriers to successful treatment, including greater levels of depression and anxiety (Nelson et al., 2006), lower insight, more perceptual disturbances, and more magical thinking compared to other OCD presentations (Tolin, Abramowitz, Kozak, & Foa, 2001).

### ***Cognitive-Behavioral Model of Scrupulosity***

Abramowitz and Jacoby (2014) articulated a cognitive-behavioral model of scrupulosity that builds on a generic model of OCD (Salkovskis, 1985) and integrates research findings particular to symptoms with religious themes (see Figure 2). According to this model, most people experience occasional unwanted and intrusive thoughts that violate their sense of morality or contravene their religious beliefs, but they tend to regard these intrusions as insignificant or meaningless (Rachman & de Silva, 1978). However, for the scrupulous OCD sufferer, these unwanted thoughts are interpreted as sinful or immoral (Abramowitz & Jacoby, 2014). These interpretations are often based in more general beliefs about the importance of thoughts, especially *thought-action fusion*: the belief that thinking something immoral is just as bad as acting immorally and that thinking about events make them more likely to occur (TAF; Shafran, Thordarson, & Rachman, 1996). Additionally, negative

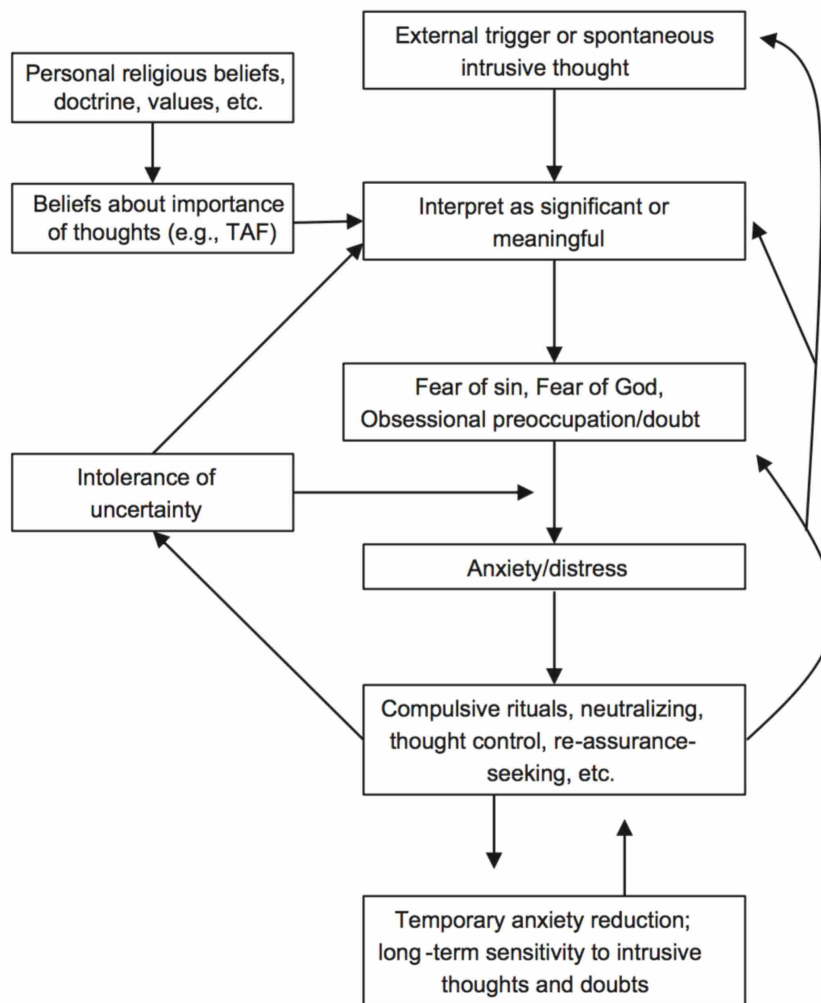


Figure 2. Cognitive-behavioral model of scrupulosity (Abramowitz & Jacoby, 2014).

interpretations of intrusions may be difficult to refute because of a low tolerance for uncertainty – a trait observed in both OCD in general and scrupulosity in particular (Fergus & Rowatt, 2015; Tolin, Abramowitz, Brigidi, & Foa, 2003)

When intrusive thoughts are viewed as sinful or immoral, they elicit fears of punishment, which in turn triggers anxiety, distress, guilt, and shame (Abramowitz & Jacoby, 2014). In an attempt to alleviate these negative emotions, scrupulous

individuals engage in various compulsions, avoidance, and neutralizing (Abramowitz & Jacoby, 2014). Although these compulsions may provide some short-term emotional relief, they also tend to reinforce beliefs about the importance of intrusive thoughts and the need for certainty, which makes negative interpretations of future intrusions more likely. Therefore, as in other types of OCD, the scrupulous individual becomes trapped in a negatively reinforced cycle of avoidance, obsession, and ritualistic behavior that ultimately causes significant long-term impairment and distress.

### ***Treatment for Scrupulosity***

As with other forms of OCD, the first-line treatment for scrupulosity is CBT that integrates Exposure and Response Prevention (ERP) with cognitive therapy techniques (Huppert & Siev, 2010). Treatment goals include the weakening of maladaptive beliefs that are inconsistent with one's religion, increasing tolerance for uncertainty, and reducing rituals, neutralizing strategies, and avoidance (Abramowitz & Jacoby, 2014). To accomplish these goals, therapists and patients collaborate to tailor ERP techniques specifically to the patient's scrupulous presentation, including strategies to violate obsessional rules about what is sinful or immoral and to differentiate normal from pathological rituals (Huppert & Siev, 2010). Additionally, treatment may involve religious clergy in order to help patients recognize contradictions between their obsessional beliefs and mainstream religious teachings, as well as to advise clergy about teachings and behavior that may reinforce scrupulous symptoms (Huppert & Siev, 2010). Findings on the efficacy of CBT with



ERP for scrupulosity are mixed, with some studies indicating lower treatment response for scrupulous OCD (Mataix-Cols et al., 2002) and others showing no differences compared to other OCD subtypes (Siev, Baer, et al., 2011).

### *Linking Hoarding and Scrupulosity*

Although numerous researchers have identified similarities and differences between HD and OCD in general (Frost et al., 2012), few have examined more specific relationships between hoarding and scrupulosity. One reason for this lack of empirical attention may be that some studies of the clinical features and measurement of scrupulosity have reported weak and non-significant bivariate correlations between symptoms of hoarding and scrupulosity (Kaviani, Eskandari, & Ghavam, 2015; Olatunji, Abramowitz, Williams, Connolly, & Lohr, 2007), suggesting that there is no relationship to be further explored. However, these results may be misleading because the measurements of hoarding in these studies were conducted using the hoarding subscale of the Obsessive Compulsive Inventory-Revised (Foa et al., 2002), which contains only three items and has failed to consistently identify HD participants in comparison with healthy and anxious controls (Frost et al., 2012). In contrast, Rowley et al. (2011) studied the relationships between scrupulosity, hoarding, and other OCD symptoms using the Saving Inventory – Revised (SI-R; Frost, Steketee, & Grisham, 2004), a comprehensive and well-validated measure of hoarding symptoms (Frost et al., 2012). Using hierarchical multiple regression, they assessed for unique contributions to the prediction of scrupulosity by symptoms of panic, social anxiety, hoarding, and OCD while controlling for anxiety and depression (Rowley et al.,

2011). Of these predictors, only hoarding and intrusive thoughts showed unique significant relationships with scrupulosity,  $\beta = .26$  and  $\beta = .22$ , respectively (Rowley et al., 2011).

The Rowley et al. (2011) findings raise an interesting question: what shared qualities of hoarding and scrupulosity account for their statistical relationship? The most obvious possibilities are the obsessional preoccupation and ritualistic behavior that characterize these syndromes and the entire OCD category (American Psychiatric Association, 2013). Similarly, anxiety is a common feature across the OCDs and both hoarding and scrupulosity are strongly associated with measures of anxiety (Nelson et al., 2006; Steketee & Frost, 2003). However, the analysis in Rowley et al. (2011) controlled for obsessive-compulsive symptoms and anxiety through the Dimensional Obsessive-Compulsive Scale (DOCS; Abramowitz et al., 2010) and the Depression, Anxiety, and Stress Scale (DASS; Lovibond & Lovibond, 1995), suggesting that hoarding and scrupulosity share features beyond anxiety, obsessive preoccupation, and compulsive behavior. Identifying these shared features would expand cognitive-behavioral models of both disorders and specify potentially important treatment targets.

### ***Guilt and Shame***

One feature that is prominent in clinical and theoretical accounts of both hoarding and scrupulosity is the experience of intense guilt and shame (Abramowitz & Jacoby, 2014; Frost & Hartl, 1996; Steketee & Frost, 2013). In hoarding, guilt and shame often result from the perceived wasting or mistreatment of objects (Frost et al.,

2012). In scrupulosity, these emotions often result from perceived violations of moral or religious rules or deficiencies in the performance of religious rituals (Abramowitz & Jacoby, 2014). Despite the qualitative descriptions of guilt and shame included in cognitive-behavioral models of hoarding and scrupulosity (Abramowitz & Jacoby, 2014; Steketee & Frost, 2013) empirical examinations of their role in either disorder are rare. For example, Weingarden and Renshaw (2015) recently reviewed the role of shame in a number of OCDs including HD, and they noted that shame has only been examined in relation to the way people who hoard feel about their symptoms, rather than on shame as an etiological or maintenance factor in the development of those symptoms. Similarly, guilt has been addressed in some research on OCD in general but not in scrupulous OCD in particular, and it has usually been measured through inferences about responses to moral dilemmas, rather than from direct and objective measurement of the emotion (e.g., Mancini & Gangemi, 2015).

Additionally, the treatment of guilt and shame in models of hoarding and scrupulosity rarely includes a discussion of the overlap and differences between these two emotions. Although many people use the terms guilt and shame interchangeably in everyday language, researchers generally conceptualize these as two distinct but related moral emotions (Cohen, Wolf, Panter, & Insko, 2011). Both are characterized by distress in response to ethical or moral transgressions (Tangney & Dearing, 2003), but they are distinguished from each other in at least two ways. The first is referred to as the self-behavior distinction: guilt involves negative feelings arising from specific evaluations of one's behavior, whereas shame involves negative feelings arising from

global evaluations of one's self (Tangney & Dearing, 2003; Tracy & Robins, 2004). Along these lines, guilt tends to motivate efforts to repair wrongdoing, such as apologizing or compensating for immoral behavior with altruistic actions. In contrast, shame tends to motivate withdrawal and avoidance (Tangney & Dearing, 2003). The second distinction between guilt and shame is based on whether moral transgressions occur in a public or private context. According to this view, guilt results from a private sense of having done something wrong, whereas shame results from public exposure of wrongdoing (Combs, Campbell, Jackson, & Smith, 2010). Some models of moral emotions integrate both of these distinctions in the conceptualization and measurement of guilt and shame (Cohen et al., 2011). Overall, studies of psychopathology that employ these models of moral emotions suggest that poor psychological adjustment is more strongly associated with shame than with guilt (Covert, Tangney, Maddux, & Heleno, 2003). However, these models have not been applied specifically to hoarding or scrupulosity.

### **Moralistic Thinking**

Identifying the ways in which guilt and shame might function in cognitive-behavioral models of hoarding and scrupulosity requires an understanding of how these emotional responses relate to cognitive processes. In current models of each disorder, durable and generalized beliefs lead to maladaptive negative interpretations of specific situations, which results in distressing emotions. It follows that generalized beliefs about morality would lead to negative moral interpretations of situations, resulting in the emotions of guilt and shame. Therefore, understanding the

moral beliefs and moral reasoning processes associated with hoarding and scrupulosity would help to explain why moral emotions play such an important role in both disorders.

Clinical descriptions of people with HD and scrupulous OCD often refer to rigid, dichotomous thinking about moral matters. For example, Frost and Steketee (2010) described the case of Anita, for whom wasting possessions was considered a moral transgression regardless of the condition or usefulness of the possession and despite the intense practical and emotional consequences of her hoarding. Similarly, people with scrupulous OCD have frequently been described as rigidly adhering to rules and beliefs about what is immoral or sinful, regardless of contextual or situational factors that many people would consider relevant to moral judgments (Nelson et al., 2006). These clinical descriptions suggest that hoarding and scrupulosity might be linked by a belief system and thinking style that includes a rigid, dichotomous, and rule-adherent approach to matters of morality. In the current study, this belief system and thinking style are collectively referred to as *moralistic thinking*.

To date, no published empirical studies have objectively assessed moralistic thinking in hoarding or scrupulosity, though several studies have examined moral reasoning in OCD more generally (e.g., Franklin, McNally, & Riemann, 2009; Harrison et al., 2012; Mancini & Gangemi, 2015; Siev, Huppert, & Chambless, 2010; Whitton et al., 2014). All of these studies used moral dilemmas to assess moral reasoning, most frequently some variant of the *trolley problem*. In the basic version of

the trolley problem, a scenario is described in which a trolley car is running out of control towards five people who are stuck on its track but there is an alternate track on which only one person is stuck. Participants are asked to make an imaginary choice between doing nothing, thereby allowing the five people to die, or throwing a switch to change the trolley car's path to the alternate track and thereby cause the death of one person. The trolley problem is a classical paradigm in philosophical discussions of morality and the two options are usually interpreted as distinguishing between the use of *deontological* and *utilitarian* moral reasoning. In deontological (from the Greek *deon* – “duty, or that which is binding”) reasoning, judgments about morality are based on the adherence of actions to rules or duties prescribed by a moral authority (Kant, 2002). Since most moral codes include an injunction against causing the death of others but not one requiring people to constantly prevent harm to others, deciding not to intervene in the path of the trolley is considered a deontological choice. In contrast, utilitarian moral reasoning involves judging the morality of actions based on the principle of maximizing happiness and minimizing suffering for the greatest number of people (Mill, 1901). Following this principle requires trolley problem participants to violate the moral injunction against causing the death of another in order to save the maximum number of people.

In applying this paradigm to the study of moral reasoning in OCD, Mancini and Gangemi (2015) found that OCD was related to a preference for the deontological over the utilitarian choice. The authors interpreted this effect as an indication that people with OCD adhere to the moral rule of “do not play god”

(Mancini & Gangemi, 2015). Using the trolley problem and similar moral dilemmas, Whitton et al. (2014), also found that preference for the deontological option was associated with OCD, as well as with reduced performance on neuropsychological measures of cognitive control. Whitton et al. (2014) interpreted these results as evidence of moral rigidity in OCD.

This interpretation is informed by contemporary theories of moral reasoning that highlight the dual roles of cognitive and affective processes in moral decision-making (Haidt, 2001). According to these theories, moral reasoning is strongly influenced by rapid, automatic emotional responses. These emotions are shaped by evolutionary and cultural forces, and they are experienced as intuitive judgments about morality (Haidt, 2001). Alongside this affective process, the slower cognitive processes of interpretation and rational deliberation take place and serve the function of corroborating or overriding intuitive judgments (Greene, Nystrom, Engell, Darley, & Cohen, 2004). Within this theoretical approach, deontological choices in the trolley problem are thought to indicate the dominance of emotional reactions to causing the death of another person, whereas utilitarian preferences are attributed to the overriding of these affective responses through cognitive deliberation about the relative moral value of killing one to save five (Greene, Morelli, Lowenberg, Nystrom, & Cohen, 2008; Greene et al., 2004). Based on this theory, the moral rigidity described by Whitton et al. (2014) suggests that people with OCD display a reduced ability to use cognitive deliberation to overcome their intuitive emotional response to the idea of causing harm. Currently, no published studies have examined

whether this type of moral rigidity or a belief in the importance of rules specifically characterizes scrupulous OCD. Similarly, no published studies have examined the possible role of these processes in hoarding.

### ***Cognitive Rigidity***

If hoarding and scrupulosity are associated with rigid moralistic thinking, it is possible that this moral rigidity is embedded in a more general cognitive rigidity that influences multiple belief domains. In fact, an association between these conditions and cognitive rigidity is suggested by data indicating high rates of comorbidity of each disorder with OCPD (Mataix - Cols et al., 2000; Siev, Steketee, et al., 2011). People with OCPD traits attempt to maintain a sense of control through order and perfection, a painstaking adherence to rules and procedures, and a generalized pattern of cognitive and behavioral rigidity (American Psychiatric Association, 2013). In addition to this general cognitive rigidity, people with OCPD traits are often particularly rigid in their thinking about moral matters (Beck, Davis, & Freeman, 2015). They tend to think in dichotomous terms about morality and to adhere to strict rules about right and wrong in order to simplify the complexity of reality (Kyrios, 1998). Therefore, it is possible that the comorbidity of OCPD with both hoarding and scrupulosity is the result of both moral and general cognitive rigidity in these disorders.

One area of concern when making inferences based on comorbidity rates between hoarding, scrupulosity, and OCPD is that the DSM-5 criteria for OCPD include being scrupulous about matters of morality and an inability to discard



worthless or worn-out objects (American Psychiatric Association, 2013). This overlap in diagnostic criteria with HD and OCD confounds correlations between these diagnoses. However, in some studies in which these problematic criteria have been removed from comorbidity analyses, both hoarding and scrupulosity have remained significantly associated with the remaining OCPD criteria (Mataix - Cols et al., 2000; Samuels et al., 2007; Siev, Steketee, et al., 2011). These findings suggest that hoarding and scrupulosity share the overall rigid characteristics of OCPD above and beyond specific hoarding or scrupulous behavior.

Empirical examinations of cognitive rigidity in hoarding and scrupulosity have mostly employed neuropsychological tasks that tap elements of cognitive flexibility such as set shifting and decision-making, and results have been mixed (Mataix-Cols, Pertusa, & Snowden, 2011). For example, McMillan, Rees, and Pestell (2013) found that hoarding participants made more perseveration errors and completed fewer categories on the Wisconsin Card Sorting Task (WCST) compared to population norms, but at least two other studies have found no differences in WCST performances between hoarding and control participants (N. S. Lawrence et al., 2006; Tolin, Villavicencio, Umbach, & Kurtz, 2011). Additionally, de Kort (2012) found evidence of reduced cognitive flexibility in hoarding participants on the final trial of the Stroop task but not on the Intra-Extra Dimensional Set-Shifting task. Similarly, although several studies have found deficits in cognitive flexibility in OCD in general (Chamberlain, Fineberg, Blackwell, Robbins, & Sahakian, 2006; Gu et al., 2007; Veale, Sahakian, Owen, & Marks, 1996), Rasmussen, Siev, Abramovitch, and

Wilhelm (2016) failed to find evidence of such deficits specifically in scrupulous OCD. One significant limitation to all of these studies is that the neuropsychological tasks they employ involve numerous basic cognitive processes, which complicates interpretations of task performance (Woody et al., 2014). Moreover, these measures of basic cognitive processes like set-switching and pattern detection seem only weakly related to the theoretical construct of cognitive flexibility as a personality trait or thinking style. It is therefore not clear if neuropsychological research really addresses the type of cognitive rigidity that characterizes OCPD and that may contribute to the connection between hoarding and scrupulosity.

### *Summary*

HD and scrupulous OCD are two debilitating conditions that are part of the DSM-5 (American Psychiatric Association, 2013) category of Obsessive-Compulsive and Related Disorders. This category is closely related to the anxiety disorders category, and it includes disorders characterized by obsessional preoccupation and ritualistic behavior (American Psychiatric Association, 2013). However, prior research has found a statistical relationship between hoarding and scrupulosity after controlling for these common factors, suggesting that they share other factors beyond those shared by the entire group of OCRDs. Clinical accounts of hoarding and scrupulosity, along with a limited body of empirical research, suggest that the relationship between these two conditions may be partly explained by three shared factors: a tendency to experience intense guilt and shame, rigid moralistic thinking, and general cognitive rigidity.

*Aims of the Present Study*

Therefore, the current study was designed to achieve three aims:

- 1) Substantiate the relationship between hoarding and scrupulosity by replicating previous research findings showing a correlation between the two when controlling for symptoms of OCD, anxiety, and depression;
- 2) Test the hypothesis that this relationship is explained by the mutual effects of guilt and shame, rigid moralistic thinking, and cognitive rigidity on both disorders; and,
- 3) Refine this explanatory model through post-hoc and exploratory analyses of other indicators of moral reasoning and moral emotions.

## CHAPTER III

### Method

#### *Participants*

285 participants were recruited via Amazon's Mechanical Turk (MTurk) website, and 195 participants were included in the final sample. The mean age of participants was 40.62 years with a standard deviation of 11.5 years. The sample was 55.6% female, and predominantly white (82.7%), not Hispanic or Latino/a (93.9%), and heterosexual (93.4%). The religious category most frequently endorsed was no religion (42.9%), followed by Protestant (28.1%) and Catholic (18.4%). In terms of reported education level, 87.2% of participants reported at least some college education. All sample characteristics are listed in Table 1 on the following page.

#### *Measures*

##### *Symptom Measures*

*Savings Inventory – Revised* (SI-R; Frost et al., 2004). The SI-R is a 23-item self-report measure designed to assess symptoms of hoarding. The SI-R has three subscales, corresponding to the primary symptoms of hoarding disorder: difficulty discarding, excessive clutter, and excessive acquisition (Frost et al., 2004). Total and subscale scores have demonstrated strong internal consistency ( $\alpha = .87 - .92$ ) and the ability to discriminate hoarding samples from both non-hoarding OCD and non-clinical controls groups (Frost et al., 2004).

Table 1  
*Sample Characteristics*

Characteristic		Mean	<i>SD</i>
Age		40.62	11.5
Characteristic		<i>n</i>	%
Gender	Male	85	43.4
	Female	109	55.6
	Other	2	1.0
Race	White	162	82.7
	African-American	15	7.7
	Asian/Asian-American	12	6.2
	American-Indian	2	1.0
	Other	5	2.6
	Ethnicity	Not Hispanic or Latino/a	184
	Hispanic or Latino/a	12	6.1
Religion	No religion	84	42.9
	Protestant	55	28.1
	Catholic	36	18.4
	Other religion	13	6.6
	Jewish	4	2.0
	Buddhist	3	1.5
	Muslim	1	0.5
	Education	High School	25
	Some college	76	38.8
	College degree	83	42.3
	Graduate degree	12	6.1
Sexual Orientation	Straight/Heterosexual	183	93.4
	Pansexual	4	2.0
	Bisexual	4	2.0
	Asexual	2	1.0
	Gay	1	.5
	Lesbian	1	.5
	Queer	1	.5

*Note.*  $N = 196$ .

*Penn Inventory of Scrupulosity* (Abramowitz, Huppert, Cohen, Tolin, & Cahill, 2002). The PIOS is a 19-item self-report measure of scrupulosity. It includes two subscales, the Fear of God scale and the Fear of Immorality subscale. The PIOS total and subscale scores have demonstrated excellent internal reliability in previous studies ( $\alpha = .94 - .97$ ), and total scores reliably discriminate patients with symptoms of scrupulous OCD from patients with other OCD features and anxiety disorders (Huppert & Fradkin, 2015).

*Dimensional Obsessive Compulsive Scale* (DOCS; Abramowitz et al., 2010). The DOCS is a 20-item self-report measure that assesses the severity of four OCD symptom dimensions: contamination, responsibility for harm and mistakes, symmetry/ordering, and unacceptable thoughts. The DOCS has demonstrated strong internal consistency in all subscales ( $\alpha = .94 - .96$ ) and adequate test-retest reliability ( $r_s = .55 - .66$ ). The DOCS also demonstrated convergence with other well-validated OCD measures (Abramowitz et al., 2010).

*Depression Anxiety and Stress Scale –21* (DASS-21; Henry & Crawford, 2005). The DASS-21 is 21-item self-report measure that includes three 7-item scales that measure depression, anxiety, and stress. The DASS-21 has demonstrated good internal reliability ( $\alpha = .82 - .93$ ) and good convergent and discriminant validity when compared with other validated measures of depression and anxiety (Henry & Crawford, 2005).

### *Moral Reasoning Measures*

*The Guilt Inventory* (GI; Kugler & Jones, 1992). The GI is a 45-item self-report measure of the tendency to experience guilt and shame. The inventory includes three subscales: trait guilt, state guilt, and moral standards. These scales have demonstrated good internal reliability and temporal stability, as well as good convergent and discriminant validity in relation to other measures of guilt and related constructs (Kugler & Jones, 1992; Tilghman-Osborne, Cole, & Felton, 2010). According to the authors of the Guilt Inventory, the moral standards subscale was intended to measure the “readiness to experience guilt on the basis of the strength of one’s moral values” (Kugler & Jones, 1992, p. 319). It was therefore used in the current study as one of several variables measuring moral reasoning. However, inspection of the item content of the moral standards scale suggested that only five of the fifteen items in the scale appeared consistent with our theoretical construct of the rigid and dichotomous moral reasoning hypothesized to contribute to hoarding and scrupulosity. Therefore, we used these five items to construct a new scale that we titled Moral Rigidity and we used confirmatory factor analysis (CFA) to assess the extent to which these five items loaded on a single latent variable (see Appendix 2 for items). In the initial CFA, all items showed acceptable factor loadings (range .64 – .71) but the chi-square test for the overall model indicated a lack of fit between the model and the data,  $\chi^2(5) = 46.02, p < .001$ . Examination of modification indices showed that this lack of fit was largely affected by a correlation between the error terms associated with items 8 and 12. When this correlation was included in a second

CFA, the chi-square test indicated good model fit,  $\chi^2(4) = 3.52, p = .48$ . The internal reliability of the Moral Rigidity scale was corroborated by calculating Cronbach's alpha, which indicated good internal consistency ( $\alpha = .86$ ).

***Moral Orientation Scale*** (MOS; Conway, Love, & Mottner, 2016). The MOS is a 28-item self-report instrument designed to assess how people process moral judgments. The MOS measures four orientations about moral or ethical matters. The Affective Orientation scale (MOS Affective) measures the tendency to experience strong negative emotions in response to the immoral behavior of others. The Deliberative Orientation scale (MOS Deliberative) measures beliefs and attitudes about resolving ethical matters through a problem-solving, context-dependent process. The Rule Orientation scale (MOS Rule) measures the attitude that moral matters should be resolved through adherence to rules. Lastly, the Sentimental Orientation scale (MOS Sentiment) measures a tendency to "follow one's heart" rather than logic in matters of morality. In a study of moral dilemmas, Conway et al. (2016) found that these scales demonstrated good internal consistency ( $\alpha s = .76-.87$ ), as well as good convergent and discriminant validity.

### ***Moral Emotion Measures***

***The Guilt and Shame Proneness Scale*** (Cohen et al., 2011). The GASP is a 16-item self-report measure that assesses the propensity to feel guilt and shame across a variety of personal transgressions. The GASP contains two guilt subscales: Negative Behavior Evaluation (GASP NBE), which measures evaluations of one's behavior as wrong, and Repair (GASP Repair), which measures the tendency to



attempt to repair situations after a perceived moral transgression. The GASP also contains two shame scales: Negative Self Evaluation (GASP NSE), which measures evaluations of oneself as bad or immoral, and Withdraw (GASP Withdraw), which measures the tendency to withdraw from situations after a perceived moral transgression. These GASP subscales have demonstrated adequate internal consistency ( $\alpha = .62 - .71$ ) and convergence with other measures of guilt and shame (Cohen et al., 2011).

***Anticipated Guilt*** (AG; Roseman, Wiest, & Swartz, 1994). The AG is a 10-item self-report measure in which participants rate their expected reactions to a hypothetical moral transgression, which involves the participant receiving too much change at a retail store and keeping the money instead of returning it. In terms of the self-behavior distinction between guilt and shame, the AG contains items consistent with both emotions. For example, the statement “I would feel like undoing what I have done” relates to guilt about one’s behavior, and the statement “I would feel like punishing myself” relates to shame about one’s self. The AG has demonstrated good internal consistency (Steenhaut & Van Kenhove, 2006) and good construct validity (Roseman et al., 1994) in previous research.

### ***Cognitive Flexibility Measures***

***Cognitive Flexibility Scale*** (CFS; Martin & Rubin, 1995). The CFS is a 12-item self-report measure of cognitive flexibility. It has demonstrated adequate internal consistency ( $\alpha = .77$ ) and good one-week test-retest reliability ( $r = .83$ ), as well as

good convergent and discriminant validity when compared to measures of communication flexibility and attitude rigidity (Martin & Rubin, 1995).

*Cognitive Flexibility Inventory* (CFI; Dennis & Vander Wal, 2010). The CFI is a 20-item self-report instrument developed to measure the type of cognitive flexibility thought to be involved in challenging and modifying maladaptive cognitions in cognitive therapy. It contains two subscales: Control, measuring the tendency to perceive difficult situations as controllable, and Alternative, the ability to perceive alternative viewpoints and generate alternative solutions to problems. These factors demonstrated excellent internal consistency ( $\alpha$ s = .84-.91) and temporal stability in the CFI's 7-week development study (Dennis & Vander Wal, 2010).

### *Procedures*

The opportunity to participate in the study was advertised as a task on MTurk and made available to all registered MTurk workers who were at least 18 years old and located in the United States. Interested workers followed a hyperlink to Nova Southeastern University's Redcap system website, where they were presented with the informed consent form. If they provided consent, they were presented with the study survey. Each instrument was presented on a separate web page, and pages were designed to look virtually identical to the paper forms of the instruments. If participants reached the end of an instrument without responding to all items, they were notified and encouraged to complete the instrument, but they were not stopped from submitting the incomplete form and moving to the next instrument. Participants

who submitted all instruments received a completion code, which they entered in their MTurk account to receive a \$4.00 payment for their participation.

### *Data Analysis Strategies*

The primary analysis of the study was conducted using structural equation modeling (SEM). SEM allowed us to construct latent variables with multiple indicators for each of the hypothesized predictors, as well as to estimate their regression coefficients when two outcome variables were regressed on the predictors simultaneously. The specified model of our primary hypothesis also allowed for the estimation of the partial correlation between our two outcomes (Preacher, 2006), which we used to assess the extent to which the observed relationship between these two variables were explained by the predictors (MacKinnon, Krull, & Lockwood, 2000). The final model in the post-hoc analysis was tested in a similar fashion, but employed only observed indicators and no latent variables. All SEM analyses were conducted in SPSS AMOS Version 21 using maximum likelihood estimation. Additionally, correlational and regression analyses were conducted using SPSS Version 20.

## CHAPTER IV

### Results

#### *Data Preparation*

The study survey included five attention check items (e.g., “Please answer 3 to this item”) to help identify patterns of random responding. Participants who incorrectly responded to any of the five attention check items, as well as those who failed to complete 90% of all measures, were excluded from the analyses. Additionally, we calculated the total time taken to complete the entire study survey in order to assess the extent to which participants appeared actively engaged in the study. Although most participants completed the study in an appropriate amount of time (Mean = 56.6 minutes,  $SD = 74.2$  minutes), some participants’ completion times were too small to indicate real engagement (minimum time to completion was 3.5 minutes for 324 items). Therefore, we examined internal consistency on a number of study measures separately for participants who completed the study in under 30 minutes and under 20 minutes. No decrements in internal consistency were noted for the under 30 minutes group, but Cronbach’s alphas for the under 20 minute group were noticeable lower on several measures. We therefore also excluded participants who completed the study in under 20 minutes, resulting in a final sample size of  $N = 196$ .

#### *Descriptive Statistics*

Table 2 below lists the minimum and maximum scores, mean, standard deviation, skew, kurtosis, and internal consistency statistics for every study measure. All measures demonstrated adequate to excellent internal consistency ( $\alpha s = .72 - .96$ ).

No distributions displayed large departures from normality in terms of skewness (Skew = -1.47 – 1.94), though some distributions showed large kurtosis values (kurtosis = -0.44 – 4.20). A correlation matrix including all study variables is displayed in Table 3.

Table 2.  
*Descriptive statistics for all study variables.*

Var.	Min	Max	Mean	SD	Skew	Kurtosis	$\alpha$
SIR	0	71	23.86	16.23	0.58	-0.44	.92
PIOS	0	69	11.98	13.78	1.44	1.95	.96
DASS-21	0	57	14.98	13.66	0.92	-0.04	.96
DOCS Contamination	0	15	2.72	3.16	1.39	1.85	.91
DOCS Harm	0	17	2.88	3.64	1.41	1.80	.94
DOCS Intrusive Thoughts	0	15	2.93	3.42	1.08	0.45	.92
DOCS Symmetry	0	15	2.09	3.05	1.94	4.20	.93
GI Moral Standards	15	74	44.44	10.19	0.13	0.90	.85
Moral Rigidity	5	25	16.52	4.54	-0.16	-0.19	.86
MOS Rule	7	49	28.65	7.76	0.29	-0.08	.86
MOS Affective	15	49	39.58	6.63	-1.03	1.46	.88
MOS Deliberative	7	49	36.95	5.81	-0.99	3.48	.79
MOS Sentiment	9	49	29.34	8.79	-0.21	-0.59	.93
Anticipated Guilt	10	50	32.53	11.72	-0.32	-0.99	.95
GASP NBE	4	28	22.50	4.79	-1.03	0.78	.74
GASP Repair	4	28	23.27	4.19	-1.34	3.02	.77
GASP NSE	4	28	23.06	4.58	-1.47	2.81	.80
GASP Withdraw	4	26	11.81	5.03	0.58	-0.25	.70
CFS	29	72	55.60	8.51	-0.30	-0.08	.87
CFI	59	126	96.70	10.02	-0.40	1.16	.72

*Note.*  $N = 196$ .

Table 3

*Correlation Matrix for All Study Variables*

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1 SI-R	.48	.54	.53	.51	.46	.41	.01	-.03	.05	.14	-.13	.20	.15	.11	-.05	.09	.22	-.34	-.39
2 PIOS	-	.41	.35	.33	.60	.33	-.10	-.07	.19	-.04	-.19	.26	.23	.16	.01	.12	.28	-.33	-.30
3 DASS-21	-	-	.36	.53	.56	.41	-.01	.01	-.06	-.03	-.25	-.01	.11	.07	-.21	.03	.37	-.57	-.58
4 DOCS Contamination	-	-	-	.55	.41	.54	.10	.03	.04	-.01	.00	.16	.01	-.10	-.09	-.08	.19	-.16	-.16
5 DOC Harm	-	-	-	-	.54	.55	-.05	.02	-.01	.14	-.09	.05	.15	.09	-.10	.06	.22	-.33	-.30
6 DOCS Thoughts	-	-	-	-	-	.42	-.11	.01	.05	-.01	-.21	.18	.13	.07	-.06	.07	.27	-.30	-.32
7 DOCS Symmetry	-	-	-	-	-	-	-.02	.00	.02	.00	.01	.09	.15	.05	-.06	.08	.16	-.17	-.13
8 GI Moral Standards	-	-	-	-	-	-	-	.65	-.25	-.11	.30	.09	-.13	-.19	-.11	-.08	.00	-.02	-.01
9 Moral Rigidity	-	-	-	-	-	-	-	-	-.40	-.04	.36	-.06	-.03	-.04	.03	.03	-.07	.00	.02
10 MOS Rule	-	-	-	-	-	-	-	-	-	.29	-.20	.12	.24	.17	.08	.09	.02	.05	.00
11 MOS Affective	-	-	-	-	-	-	-	-	-	-	.09	.44	.56	.54	.50	-.03	.14	.14	.16
12 MOS Deliberative	-	-	-	-	-	-	-	-	-	-	.06	-.09	-.08	.18	.01	-.26	.37	.42	.42
13 MOS Sentiment	-	-	-	-	-	-	-	-	-	.10	.05	.09	-.03	.13	-.06	-.03	.13	-.06	-.03
14 Anticipated Guilt	-	-	-	-	-	-	-	-	-	-	-	.76	.53	.48	.09	.02	.06	.06	.06
15 GASP NBE	-	-	-	-	-	-	-	-	-	-	-	-	.63	.67	.08	.01	.05	.05	.05
16 GASP Repair	-	-	-	-	-	-	-	-	-	-	-	-	-	.62	-.05	.26	.32	.32	.32
17 GASP NSE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.05	-.01	.04	.04	.04
18 GASP Withdraw	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-.41	-.42	-.42
19 CFS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-.42
20 CFI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.83

Note.  $N = 196$ .

***Replicating the Unique Relationship Between Hoarding and Scrupulosity***

As a first step in examining the relationship between hoarding and scrupulosity, we sought to replicate previous findings showing that hoarding symptoms predicted scrupulosity after controlling for symptoms of OCD, anxiety, and depression (Rowley et al., 2011). We conducted a multiple regression analysis with the PIOS as the dependent variable and the four DOCS scales, the SI-R, and the DASS-21 as predictor variables. Results of this analysis are listed in Table 4 below.

Table 4  
*Prediction of Scrupulosity by Hoarding, OCD, Anxiety, and Depression*

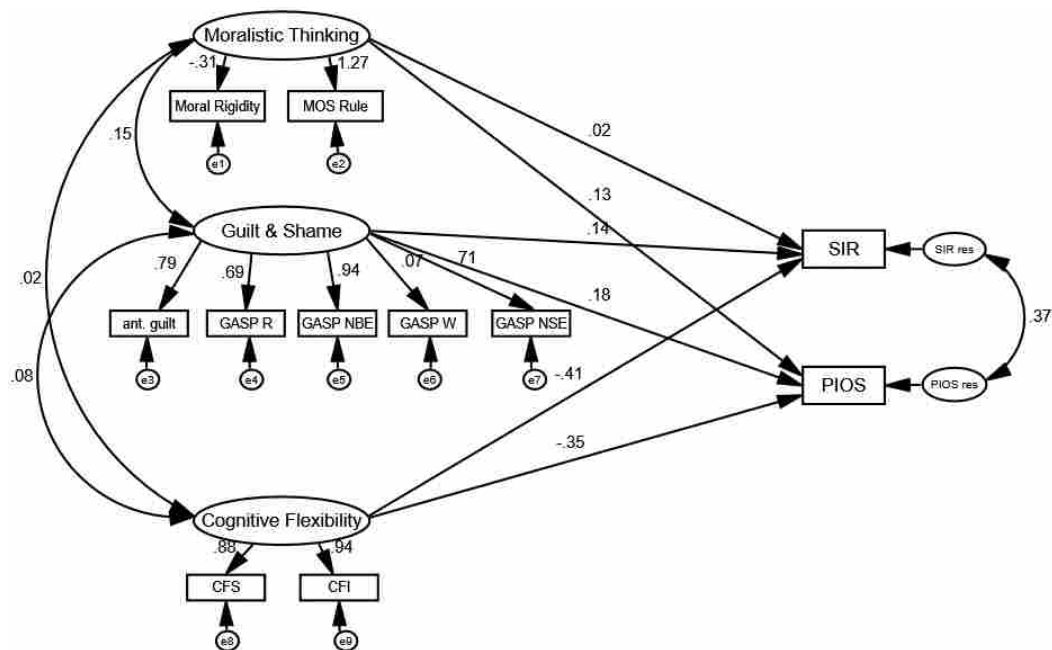
Var.	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>	<i>p</i>	<i>sr</i> <sup>2</sup>
DASS-21	0.02	0.08	0.02	0.25	.80	<.01
DOCS Contamination	0.17	0.33	0.04	0.51	.61	<.01
DOCS Harm	-0.49	0.30	-0.13	-1.63	.11	<.01
DOCS Intrusive Thoughts	2.01	0.29	0.50	6.89	<.001	.14
DOCS Symmetry	0.26	0.32	0.06	0.79	.43	<.01
SI-R	0.22	0.06	0.26	3.53	.001	.04

*Note.* For full model,  $F(6,189) = 22.68$ ,  $p < .001$ ,  $R^2 = .42$ .

Not surprisingly, the complete set of independent variables significantly predicted the PIOS,  $F(6,189) = 22.68$ ,  $p < .001$ ,  $R^2 = .42$ . Individually, only the DOCS Intrusive Thoughts subscale and the SI-R were uniquely related to the PIOS when controlling for other predictors ( $\beta = .50$ ,  $p < .001$ ,  $sr^2 = .14$  for DOCS intrusive thoughts and  $\beta = .26$ ,  $p = .001$ ,  $sr^2 = .04$  for SI-R). These results are nearly identical to those found in Rowley et al. (2011) and therefore provide additional support to the proposition that hoarding and scrupulosity share unique features above and beyond obsessive-compulsive symptoms and anxiety.

### *Test of Hypothesized Three-Factor Model*

We tested our initial hypothesis about the relationship between hoarding and scrupulosity using SEM. The specified model consisted of three correlated latent factors, with each factor connected to both hoarding (i.e., SI-R) and scrupulosity (i.e., PIOS) by direct causal paths. The first factor, Moralistic Thinking, was composed of two observed variables, Moral Rigidity and the MOS rule orientation subscale. All four GASP subscales and the Anticipated Guilt scale loaded on the second factor, Guilt and Shame. Finally, cognitive rigidity was represented by low scores on the Cognitive Flexibility factor, composed of the CFS and the CFI. The path diagram for the model with estimated standardized path coefficients is presented in Figure 3 below.



*Figure 3.* Structural equation model of the relationship between hoarding and scrupulosity, controlling for Moralistic Thinking, Guilt and Shame, and Cognitive Flexibility.



The minimum fit function chi-square for the hypothesized model was statistically significant,  $X^2(36) = 123.09$ ,  $p < .001$ , indicating poor model fit. This lack of fit was corroborated by inspection of model fit indices. The GFI (.90) failed to meet the recommended threshold of greater than or equal to .95 (Shevlin & Miles, 1998). The CFI (.90) was also below the recommended cutoff of .95 (Hu & Bentler, 1999). Finally, the RMSEA (.11) exceeded the recognized upper limit of .07 (Steiger, 2007). Examination of the regression weights of the three latent factors with the SIR and the PIOS (listed in Table 5 below) showed that the poor model fit was attributable to the fact that only one latent factor, Cognitive Flexibility, had significant effects on the dependent variables. In contrast, the Guilt and Shame and Moralistic Thinking factors were associated neither with hoarding nor scrupulosity. Additionally, the coefficients for the paths between these two factors and their respective observed indicators suggest problems in the measurement of the latent factors themselves. For the Moralistic Thinking factor, the standardized loading of the moral rigidity variable was weak and negative (-.31), whereas the MOS rule loading was positive (1.27) and associated with a negative error variance, indicating that the two variables did not load together on a coherent or meaningful latent factor. For the Guilt and Shame factor, four of the five observed indicators had acceptable factor loadings (.69 – .94), but the GASP withdraw subscale did not load (.07) on the latent variable. However, even when the GASP withdraw subscale was dropped from the model, the relationships between the latent Guilt and Shame factor and the dependent variables did not improve. Therefore, unlike the Moralistic Thinking factor, the Guilt

and Shame factor represented a coherent construct, but one that was not associated with hoarding or scrupulosity.

Table 5  
*Regression Weights and p-values for Factors in Hypothesized Model*

Var.	SI-R				PIOS			
	B	SE	<i>p</i>	$\beta$	B	SE	<i>p</i>	$\beta$
Moralistic Thinking	.04	.09	.69	0.02	.18	.20	.39	0.13
Guilt and Shame	6.47	7.47	.39	0.14	7.06	7.92	.37	0.18
Cognitive Flexibility	-.44	.08	<.001	-0.41	-.32	.06	<.001	-0.35

*Note.* *N* = 196.

Taken together, the results of the SEM analysis supported only one of three aspects of our initial hypothesis. Consistent with our predictions, cognitive rigidity (i.e. low cognitive flexibility) was associated with both hoarding and scrupulosity. Contrary to our hypothesis, the combination of guilt and shame did not significantly predicted either disorder. Moralistic thinking was also not associated with the dependent variables, but the lack of coherence in the factor's measurement model makes it difficult to draw conclusions about this result.

#### *Post-Hoc Analyses*

In order to improve our explanatory model, we ran a series of post-hoc analyses, beginning with an inspection of bivariate correlations to identify individual predictor variables that correlated significantly with both hoarding and scrupulosity. These identified predictors were then entered together into multiple regression analyses of each dependent variable to assess their contributions when controlling for each other. Next, variables that contributed unique variance in both multiple regression analyses were entered in a single partial correlation analysis using SEM to

assess their simultaneous effects on hoarding and scrupulosity. Finally, the specificity of these effects to hoarding and scrupulosity was examined by regressing other OCD symptom measures on the same set of predictors.

### ***Bivariate Correlations***

As a first step in identifying shared factors, we examined bivariate correlations between the two outcomes and 13 potential predictors across three domains: moral reasoning, moral emotions, and cognitive flexibility. Moral reasoning variables included the Moral Standards subscale of the Guilt Inventory (Kugler & Jones, 1992), the Moral Rigidity scale we constructed from a subset of Moral Standards items, and the four moral orientation subscales from the Moral Orientation Scale (Conway et al., 2016). Moral emotion variables included the Anticipated Guilt scale (Roseman et al., 1994) and the four subscales of the GASP (Cohen et al., 2011). Cognitive flexibility variables included both the CFS and the CFI.

Pearson correlational coefficients for each variable with the SI-R and the PIOS are listed in Table 6 below. Five of the 13 predictors demonstrated significant bivariate correlations with both outcomes. Contrary to the initial hypothesis of our study, the MOS Rule Orientation subscale correlated with only the PIOS and moral rigidity did not correlate with either dependent variable. Within the remaining indicators of moral reasoning, only the MOS Sentimental subscale significantly predicted both hoarding,  $r(196) = .20, p = .005$ , and scrupulosity,  $r(196) = .26, p < .001$ . Additionally, the MOS Deliberative subscale was significantly and negatively

Table 6.  
*Bivariate Correlations between 13 Predictors and 2 Outcomes*

Variable	SI-R	PIOS
GI Moral Standards	.01	-.10
Moral Rigidity	-.03	-.07
MOS Rule	.05	.19**
MOS Affective	.14*	-.04
MOS Deliberative	-.13	-.19**
MOS Sentiment	.20**	.26**
Anticipated Guilt	.15*	.23**
GASP NBE	.11	.16*
GASP Repair	-.05	.01
GASP NSE	.09	.12
GASP Withdraw	.22**	.28**
CFS	-.34**	-.33**
CFI	-.39**	-.30**

Note.  $N = 196$ .

\* $p < .05$ , \*\* $p < .01$

related to scrupulosity,  $r(196) = -.19, p = .009$  and approached a significant negative relationship with hoarding,  $r(196) = -.13, p = .08$ . Two emotional predictors were related to both outcomes: Anticipated Guilt (with SI-R,  $r(196) = .15, p = .04$ ; with PIOS  $r(196) = .23, p = .001$ ) and GASP Withdraw (with SI-R,  $r(196) = .22, p = .002$ ; with PIOS  $r(196) = .28, p < .001$ ). Finally, both cognitive flexibility measures were significantly and negatively related to the SIR and the PIOS (CFS with SI-R,  $r(196) = -.34, p < .001$ , with PIOS,  $r(196) = -.33, p < .001$ ; CFI with SI-R,  $r(196) = -.39, p < .001$ , with PIOS,  $r(196) = -.30, p < .001$ ).

### ***Multiple Regression Analyses***

In the next step of refining our model, we conducted multiple regression analyses for each outcome using the set of five predictors that showed significant

bivariate relationships with both the SI-R and the PIOS. However, in the first run of these analyses, the CFS and the CFI, which were strongly correlated with each other in the bivariate analyses ( $r = .83$ ) and appeared to overlap considerably in terms of item content, demonstrated a moderate level of multicollinearity (Variance Inflation Factors = 3.3 for each), suggesting the use of both variables in the model was redundant. Of the two measures, the CFS has a simpler factor structure and more well established psychometric properties. Therefore, the CFS was retained and the CFI was dropped from the model, leaving the MOS Sentiment, Anticipated Guilt, GASP Withdraw, and the CFS as predictors of hoarding and scrupulosity. Regression diagnostics indicated that no observations exerted excessive influence on model fit or individual parameter estimations. However, the assumption of homoscedasticity was not tenable for the analysis with the PIOS as the outcome. This issue is further addressed in the discussion of study limitations. The results of the two analyses are listed below in Table 7.

Table 7.  
*Multiple Regression Analyses of Four Predictors of the SI-R and PIOS*

DV	SI-R					PIOS				
$R^2$	.17					.23				
$F$	9.71**					13.85**				
Var.	$B$	$SE$	$\beta$	$p$	$sr^2$	$B$	$SE$	$\beta$	$p$	$sr^2$
MOS S	0.29	.12	0.16	.02	.02	0.33	.10	0.21	.002	.04
AG	0.18	.09	0.13	.05	.02	0.24	.08	0.20	.002	.04
GASP W	0.18	.24	0.06	.45	<.01	0.35	.19	0.13	.07	.01
CFS	-0.59	.14	-0.31	<.001	.08	-0.43	.11	-0.27	<.001	.06

Note.  $N = 196$ . MOS S = MOS Sentimental Orientation. AG = Anticipated Guilt. GASP W = GASP Withdraw.

\*\* $p < .01$

As a set, the four predictors significantly predicted both the SI-R,  $F(4,191) = 9.71, p < .001, R^2 = .17$ , and the PIOS,  $F(4,191) = 13.85, p < .001, R^2 = .23$ . In terms of unique contributions, three variables remained significantly related to both outcomes when controlling for the other predictors: MOS Sentiment, Anticipated Guilt, and the CFS. The CFS demonstrated the strongest effect on both the SIR,  $\beta = -0.31, p < .001, sr^2 = .08$ , and the PIOS,  $\beta = -0.27, p < .001, sr^2 = .06$ . The MOS Sentiment had small, significant effects on both outcomes,  $\beta = 0.16, p = .02, sr^2 = .02$ ,  $\beta = 0.21, p = .002, sr^2 = .04$ , as did Anticipated Guilt,  $\beta = 0.13, p = .05, sr^2 = .02$ , and  $\beta = 0.20, p = .002, sr^2 = .04$ , for the SI-R and PIOS, respectively. In contrast, the GASP Withdraw scale no longer showed significant relationships with the SI-R,  $\beta = 0.06, p = .45, sr^2 = .003$ , or PIOS,  $\beta = 0.13, p = .07, sr^2 = .01$  when controlling for the other predictors.

### ***Partial Correlation***

Next, the three predictors that contributed significant unique variance to both dependent variables in the two separate multiple regression analyses were entered into a structural equation model similar to our original SEM analysis. However, in this new, simpler model, the three observed variables were connected directly to the dependent variables via causal paths, rather than loading onto latent factors. This allowed us to estimate their effects on hoarding and scrupulosity simultaneously, as compared to the separate analyses we conducted using multiple regression. The path diagram for this model with estimated parameters is shown in Figure 4 below.

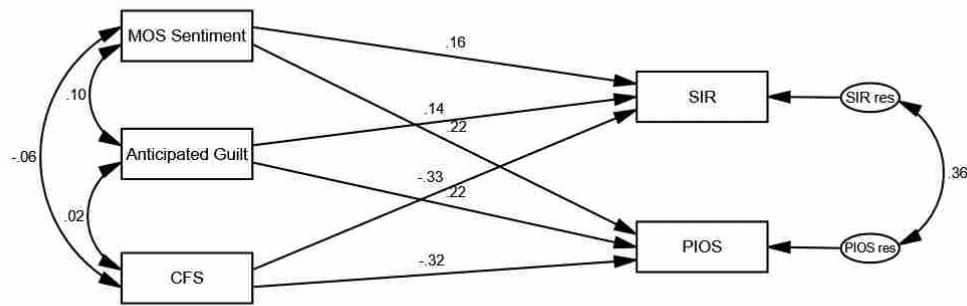


Figure 4. *Structural equation model of the relationship between hoarding and scrupulosity, controlling for MOS Sentiment, Anticipated Guilt, and Cognitive Flexibility.*

Because this model is saturated, estimates of overall model fit were not calculable. In terms of the individual predictors, inspection of the standardized regression coefficients (listed in Table 8 below) showed that all three variables significantly predicted both outcomes.

Table 8  
*Regression Weights and p-values for Final Model*

Var.	SI-R				PIOS			
	B	SE	<i>p</i>	$\beta$	B	SE	<i>p</i>	$\beta$
MOS Sentiment	.30	.12	.01	0.16	.35	.10	<.001	0.22
Anticipated Guilt	.19	.09	.04	0.14	.25	.08	<.001	0.22
Cognitive Flexibility	-.64	.13	<.001	-0.33	-.52	.10	<.001	-0.32

*Note.* *N* = 196.

In addition to inspecting the individual predictors, we calculated the partial correlation between the SI-R and PIOS when controlling for the set of predictors by estimating the correlation between the residual terms of the two outcomes. The partial correlation was .36, compared to their bivariate correlation of .48. These are equivalent to squared correlational coefficients of .13 and .23, respectively, or a 44% decrease in variance in one outcome accounted for by the other, indicating that the

combined influence of the MOS Sentiment, Anticipated Guilt, and CFS explained a considerable portion of the relationship between the SI-R and PIOS. However, the partial correlation of .36 between hoarding and scrupulosity remained statistically significant ( $p < .001$ ), suggesting that part of this relationship remains unexplained.

### *Specificity to Hoarding and Scrupulosity*

In the final step in our analyses, we evaluated the specificity of the effects of the MOS Sentiment, Anticipated Guilt, and CFS measures by testing their relationships with other types of OCD besides scrupulosity. Four separate multiple regression analyses were conducted with a different DOCS scale as the dependent variables in each analysis. The results of these analyses are listed in Table 9 below.

Table 9  
*Multiple Regression Analyses with DOCS Scales as Dependent Variables*

DV	Var.	<i>B</i>	<i>SE</i>	$\beta$	<i>p</i>	<i>sr</i> <sup>2</sup>
Contamination	MOS S	0.05	0.03	0.15	.04	.02
	AG	<0.001	0.02	<0.001	.99	<.01
	CFS	-0.06	0.03	-0.15	.03	.02
Harm	MOS S	0.01	0.03	0.02	.82	<.01
	AG	0.05	0.02	0.16	.02	.02
	CFS	-0.14	0.03	-0.33	<.001	.11
Thoughts	MOS S	0.06	0.03	0.25	.03	.02
	AG	0.03	0.02	0.12	.08	.01
	CFS	-0.12	0.03	-0.30	<.001	.09
Symmetry	MOS S	0.02	0.02	0.06	.37	<.01
	AG	0.04	0.02	0.15	.04	.02
	CFS	-0.06	0.03	-0.20	.02	.03

*Notes.* For contamination:  $F(3,192) = 3.24$ ,  $p = .02$ ,  $R^2 = .05$ ; Harm:  $F(3,192) = 9.97$ ,  $p < .001$ ,  $R^2 = .14$ ; Thoughts:  $F(3,192) = 9.63$ ,  $p < .001$ ,  $R^2 = .12$ ; and Symmetry:  $F(3,192) = 3.78$ ,  $p = .01$ ,  $R^2 = .06$ .



As a set, the three predictors significantly related to each of the DOCS scales ( $R^2$ s = .05-.14,  $ps < .05$ ). However, in contrast to the SI-R and PIOS, none of the DOCS scales were significantly related to all three individual predictors. The MOS sentiment scale was significantly related only to contamination and intrusive thoughts ( $\beta = 0.15$ ,  $p = .04$ ,  $sr^2 = .02$  and  $\beta = 0.25$ ,  $p = .03$ ,  $sr^2 = .02$ , respectively). Anticipated guilt was significantly related to harm and symmetry, ( $\beta = 0.16$ ,  $p = .02$ ,  $sr^2 = .02$  and  $\beta = 0.15$ ,  $p = .04$ ,  $sr^2 = .02$ , respectively), and approached a significant relationship with intrusive thoughts,  $\beta = 0.11$ ,  $p = .08$ ,  $sr^2 = .01$ . Finally, the CFS was significantly related to all four DOCS scales,  $\beta$ s = -0.15 to -0.30,  $ps < .05$ ,  $sr^2$ s = .02 – .11. These results indicated that, although no individual predictor is specifically related only to hoarding and scrupulosity, the constellation of significant relationships with all three variables were only observed in these two conditions.

## CHAPTER V

### Discussion

The main purpose of this investigation was to identify factors that explain the connection between hoarding and scrupulosity. In particular, we hypothesized that the relationship between these disorders would be explained by three shared factors: a tendency to experience intense guilt and shame, rigid moralistic thinking, and a larger pattern of general cognitive rigidity within which moralistic thinking is embedded. Our investigation was therefore conducted with the following aims: (1) to replicate previous findings showing a unique relationship between hoarding and scrupulosity when controlling for OCD, anxiety, and depression, (2) to determine if our hypothesized explanatory model was supported by the data, and (3) to refine this explanatory model through post-hoc analyses of related predictor variables.

In the first step of our analyses, we found that hoarding and scrupulosity demonstrated a strong correlation that remained significant after controlling for symptoms of OCD, anxiety, and depression. This result replicates the findings of Rowley et al. (2011) and lends support to the idea that hoarding and scrupulosity share features beyond those that are common to all disorders within the OCD category. However, our hypothesis about the nature of these shared features was only partially supported by our analyses. A structural equation model in which hoarding and scrupulosity were both connected by causal paths to three latent factors representing guilt and shame, moralistic thinking, and cognitive flexibility demonstrated poor fit to the data, and only the cognitive flexibility factor

demonstrated significant relationships to both dependent variables. Additionally, our model of the moralistic thinking factor failed to demonstrate measurement of a coherent construct. Although we also observed a defect in the measurement model of guilt and shame, the factor did not demonstrate significant effects on the dependent variables even when the defective indicator was removed from the model.

In order to improve our explanatory model, we conducted a number of post-hoc analyses. We first examined the bivariate correlations of potential predictor variables with hoarding and scrupulosity and identified those that were significantly related to both conditions. These variables were then entered into multiple regression analyses to control for overlap between the predictors, and these analyses yielded an identical three-predictor set, consisting of anticipated guilt, sentimental moral orientation, and cognitive rigidity. Next, this predictor set was tested simultaneously on both dependent variables using SEM, which showed that the combination of the three variables explained a considerable portion of the shared variance between hoarding and scrupulosity. Finally, we examined the specificity of this model by testing the influence of the predictor set on four dimensions of OCD symptoms, and we found that none of these OCD dimensions related significantly to all three predictors. Although the final explanatory model specified through this post-hoc analytic process differed from our initial hypothetical model in a number of important ways, the predictor set in both models were drawn from the same three domains: guilt and shame, moral reasoning, and general cognitive rigidity. Our findings in each of

these domains have implications for the conceptualization and treatment of hoarding and scrupulosity.

### *Guilt and Shame*

Although guilt and shame feature prominently in clinical descriptions of both hoarding and scrupulosity, assessment of these emotions is lacking in research on these disorders. Therefore, in the current investigation we sought to establish empirical support for the idea that a tendency to experience intense guilt and shame contributes to the development and maintenance of both hoarding and scrupulosity, and that this tendency helps to explain the correlation between these clinical conditions. To accomplish this, we assessed these moral emotions using the Anticipated Guilt scale (Roseman et al., 1994) and the Guilt and Shame Proneness scale (Cohen et al., 2011), both of which measure affective and behavioral responses associated with guilt and shame. In the Anticipated Guilt scale, all of these responses load onto a single scale. In contrast, the GASP contains separate subscales for guilt and shame, and separate scales for negative evaluations and action tendencies within each of those emotions. By employing both measures, we hoped to disentangle the separate effects of guilt and shame, which are often conflated in everyday language (Covert et al., 2003).

Our findings in this domain were mixed. In the initial SEM model, the latent factor Guilt and Shame, which was composed of all five moral emotion variables, did not have significant effects on hoarding or scrupulosity. However, in the post-hoc analyses, two individual variables – the Anticipated Guilt scale and the GASP

withdraw subscale – had significant bivariate correlations with both disorders, and the Anticipated Guilt scale remained a significant predictor when controlling for other shared factors. These results support the notion that at least some facets of guilt and shame underlie the connection between hoarding and scrupulosity.

In contrast, separating the specific effects of these two emotions proved more problematic. The fact that the shame-withdraw subscale was the only GASP scale significantly related to both hoarding and scrupulosity raised the possibility that the significant effects of the Anticipated Guilt scale could be attributed to the influence of its shame-related items, and therefore shame, but not guilt, might relate to both disorders. Such an interpretation would be consistent with previous research findings suggesting that shame has a more deleterious effect on psychological adjustment than does guilt (Tangney & Dearing, 2003). However, in our data, the Anticipated Guilt scale demonstrated strong relationships with all of the GASP scales *except* the shame withdraw scale, indicating that the effects of these two scales on the dependent variables are not redundant. It therefore appears that both shame and guilt are shared features of hoarding and scrupulosity, but their relative contributions to the connection between the disorders remain uncertain.

Despite this ambiguity about the different effects of guilt and shame, our findings highlight the importance of moral emotions in understanding hoarding and scrupulosity. Like anxiety, which is a prominent feature of both disorders, guilt and shame are likely to evoke dysfunctional, negatively reinforced behavior, including avoidance of discarding in hoarding or compulsive ritualizing in scrupulosity.

However, unlike anxiety, there is no evidence that guilt and shame gradually decrease or become more tolerable with repeated exposure to the stimuli that provoke these emotions, nor does this idea make intuitive sense. Therefore, exposure-based treatments for these disorders might be limited in their influence on guilt and shame. These treatments might be enhanced by integrating techniques that promote other ways of responding to intense emotion, such as teaching distress tolerance (Linehan, 2014) or cognitive defusion skills (Hayes, Strosahl, & Wilson, 1999).

### *Moral Reasoning*

Our initial hypothesis included the prediction that the connection between hoarding and scrupulosity would be partially explained by moralistic thinking, defined as the combination of a rigid, dichotomous style of moral reasoning and the belief that moral judgments are best made by strict adherence to prescribed rules. This prediction was based largely on clinical observations of these disorders, which include descriptions of apparent rigid adherence to inflexible moral principles, such as an injunction against wasting in hoarding or an imperative to complete religious rituals perfectly in scrupulosity. Additionally, this prediction was supported by empirical studies suggesting that obsessive-compulsive symptoms are associated with deontological moral reasoning and moral rigidity in classical moral dilemmas (Mancini & Gangemi, 2015; Whitton et al., 2014). However, our results did not support our initial prediction, but instead pointed towards a moral reasoning style characterized by the belief that moral decisions should be based on emotion rather

than rules or logic. These results have several implications for understanding moral reasoning in hoarding and scrupulosity.

First, the inverse relationship between our measures of moral rigidity and rule-based moral orientation contradicted our notion that these are two positively related aspects of a moralistic thinking style. Close inspection of the item content of these two variables highlights the complexity of this surprising result. Items in the moral rigidity variable describe an absolute and dichotomous sense of right and wrong that is insensitive to contextual details such as the motivations or consequences involved in the situation. However, these items do not specify the basis on which right and wrong is distinguished. In contrast, although some of the items of the MOS Rule subscale include dichotomous moral terms (“right or wrong”, “good or bad”), the central theme of most items is the belief that moral judgments should be strictly based on rules. Therefore, the negative correlation between these two variables raises the possibility that people who endorse a dichotomous and absolute distinction between right and wrong tend to do so based on something other than prescribed moral rules.

Secondly, regardless of the relationship between moral rigidity and rule orientation, neither variable explained the relationship between hoarding and scrupulosity. Moral rigidity was not related to either condition, and rule orientation was related only to scrupulosity. In terms of hoarding, these results suggest that difficulty discarding possessions for moral reasons is not the result of rigid beliefs about moral rules or an absolute sense of right and wrong. In contrast, scrupulous

individuals may believe that moral rules are important, but they may not believe that these rules describe rigid or dichotomous moral principles.

Although neither moral rigidity nor rule orientation explained the connection between hoarding and scrupulosity, a sentimental moral orientation was related to both conditions. This orientation is characterized by the belief that emotion is more important than logic when making moral judgments. Example items from the MOS Sentiment scale include “To do the right thing you must follow your heart” and “In matters of morality, heart is more important than your head.” In terms of dual process theories of moral reasoning, these beliefs about the importance of emotion tend to decrease the extent to which rational deliberation influences moral decision-making and thereby increase the influence of emotional responses (Conway & Gawronski, 2013; Conway et al., 2016). If these beliefs are common to hoarding and scrupulosity, it suggests that the rigid morality noted in clinical accounts of these conditions results at least in part from a rigid adherence, not to prescribed rules, but to emotionally driven intuitive responses. For example, in hoarding, moral judgments about discarding objects may be driven primarily by feelings of guilt and shame, and thoughts about the immorality of wasting may serve only as post-hoc rationalizations of these emotions, rather than causing them. In scrupulosity this process may be even more complex, because intuitive emotional responses and beliefs about the importance of rules may both contribute to rigid patterns of avoidance of moral transgressions.



The beliefs that comprise a sentimental moral orientation appear conceptually related to the idea of *emotional reasoning* (Beck, Emery, & Greenberg, 2005). In emotional reasoning, conclusions are drawn about oneself or the world based on feelings, rather than objective information (Arntz, Rauner, & Van den Hout, 1995). Cognitive models of emotional disorders identify emotional reasoning as a cognitive distortion that contributes to the development and maintenance of clinical symptoms (Beck et al., 2005). For example, individuals with anxiety disorders display a greater tendency to base estimations of threat on subjective feelings of anxiety compared to non-anxious controls (Berle et al., 2016). Similarly, individuals with intense contamination fears tend to infer the presence of contamination risk based on feelings of disgust (Verwoerd, de Jong, Wessel, & van Hout, 2013). In relation specifically to guilt, Gangemi et al. (2007) found that people with a strong tendency to feel guilty use temporary feelings of guilt as information when evaluating the likelihood of negative outcomes in OCD-relevant situations. Although emotional reasoning has not been assessed specifically in investigations of hoarding and scrupulosity, our results suggest that it may be a common cognitive distortion in these conditions.

These findings have important implications for cognitive-behavioral treatments of hoarding and scrupulosity. These treatments often include cognitive restructuring techniques intended to undermine and correct cognitive distortions by examining objective evidence. However, if objective evidence is already of lesser value than emotions because of emotional reasoning or sentimental moral orientation, it seems unlikely that emphasizing such evidence in treatment would lead to

correcting patterns of distorted thinking. Indeed, a recent investigation of the effects of CBT on treatment-seeking individuals with anxiety disorders demonstrated that emotional reasoning tendencies were largely insensitive to commonly used cognitive restructuring techniques (Berle et al., 2016). Therefore, treatments for hoarding and scrupulosity might be enhanced by integrating other cognitive approaches that emphasize the ways in which moral decisions motivated by emotions conflict with long-term valued goals, rather than with objective evidence.

### *Cognitive Rigidity*

In our original model, cognitive rigidity was conceptualized as a broad pattern of inflexible thinking within which a more specific pattern of morally rigid thinking was embedded, and the effects of both variables were hypothesized to help explain the connection between hoarding and scrupulosity. However, this conceptualization is not consistent with our results for two reasons. First, there was no correlation between cognitive rigidity and moral rigidity. Second, although moral rigidity was associated with neither hoarding nor scrupulosity, cognitive rigidity was related to both outcomes. These results suggest that cognitive rigidity must play some other role in hoarding and scrupulosity besides simply shaping dichotomous thinking about moral matters.

One possible explanation of how cognitive rigidity may function in these disorders can be found by appealing again to dual-process models of moral judgment. According to these models, emotionally driven intuitive responses to moral questions can be offset by rational deliberation about the potential consequences of one's action

(Haidt, 2001). Consequently, diminished abstract reasoning tends to result in the predominance of emotional reactions in moral situations, as evidenced by research showing that reducing cognitive control through a cognitive load manipulation reduces utilitarian responding to moral dilemmas (Greene et al., 2008; Greene et al., 2004). Whitton et al. (2014) examined this process in individuals with OCD and found that neuropsychological impairments in cognitive flexibility were also related to decreased utilitarian moral reasoning. Along these lines, our data showed that higher cognitive flexibility was related to a deliberative moral orientation, which involves resolving moral questions through a consideration of alternative viewpoints and potential consequences. Additionally, this deliberative orientation was negatively related to scrupulosity and trended towards a negative relationship with hoarding. Therefore, our findings suggest that cognitive rigidity may function in both hoarding and scrupulosity as a limiting factor in the process of critically evaluating intuitive responses to moral issues, leading to the predominance of choices motivated by guilt and shame rather than by a broader consideration of potential consequences. Moreover, this appears to be a different, though perhaps related, process from the influence of a sentimental moral orientation, which increases the influence of emotions in moral judgment because emotions are valued as moral guides. In contrast, cognitive rigidity increases the influence of emotions by decreasing the opposing force of rational deliberation.

### *Summary of Findings*

Taken together, our findings in the domains of moral emotions, moral reasoning, and cognitive flexibility point to a cohesive and compelling picture of how these factors connect hoarding and scrupulosity. Specifically, these conditions are related to the tendency to experience intense feelings of shame and guilt when faced with the possibility of a moral transgression. These feelings drive the intuitive sense that the transgression is morally wrong, and this intuition is reinforced by beliefs that emotions are the best guides when making moral evaluations. At the same time, the possibility of overriding these intuitive responses through rational deliberation about the consequences of one's actions is reduced because of impairments in cognitive flexibility. These processes help to explain the clinical observation that individuals with hoarding disorder and scrupulous OCD repeatedly engage in dysfunctional behaviors for moral reasons, despite these behaviors contributing to long-term distress and impairment. These findings also help to identify targets and strategies for treatment, such as building tolerance for distressing moral emotions, addressing distorted emotional reasoning with cognitive therapy techniques besides examining evidence, and promoting cognitive flexibility through problem-solving skills training.

### *Limitations*

There are several noteworthy limitations to the current study. First, although guilt and shame, sentimental moral orientation, and cognitive rigidity explained a considerable portion of the shared variance between hoarding and scrupulosity, the partial correlation between the outcome variables in the final model remained

significant, indicating that other common features between these conditions have yet to be identified. Additionally, although significant relationships with all three predictor variables in our model were only found with hoarding and scrupulosity, other forms of OCD were related to individual predictors. Therefore, the specificity of these relationships to hoarding and scrupulosity remains unclear.

Second, many of our interpretations were based on the results of post-hoc analyses, which were conducted in an exploratory mode without the guidance of specific hypotheses. Additionally, we did not control for family-wise type I error rates across multiple tests of statistical significance, which increased the risk that our interpretations were based on results obtained by chance. Although such an exploratory and liberal approach was appropriate given the relative scarcity of prior research in this area, interpretations made from our results should be viewed as extremely tentative and they require replication in future studies with stricter management of risk of type I error.

Third, our statistical models include directional effects that are based in theory, but the cross-sectional design of our study and correlational nature of our data do not allow for inferences about causality. Therefore, in spite of our theoretical perspective, it is not possible to determine from our data whether guilt and shame, sentimental moral orientation, and cognitive rigidity function as etiological or maintenance factors in hoarding and scrupulosity, or whether they are simply shared consequences of both disorders.

Fourth, although we were primarily interested in examining the relationship between two clinical conditions, our sample was drawn from a community rather than a clinical population. Additionally, the heterogeneity of our sample was limited, as most participants were white, not Hispanic or Latino/a, and heterosexual. Therefore, it is possible that our results will not generalize to clinical and more culturally diverse populations.

Fifth, although our measure of moral rigidity was derived from an instrument with good psychometric properties, it was not itself subjected to a comprehensive validation process. Thus, although the variable was internally consistent, there is no evidence on which to base conclusions about its construct validity. This raises the possibility that our interpretations about the absence of moral rigidity in hoarding and scrupulosity were premature.

Finally, a violation of the assumption of homoscedasticity was detected in the multiple regression analysis using the PIOS as the dependent variable, which may have biased estimates of standard errors in this model and therefore distorted significance tests of the regression coefficients. However, a natural logarithm transformation of the PIOS was used as the dependent variable in a separate analysis, and this analysis showed no substantial heteroscedasticity and no meaningful difference in regression coefficients or overall model fit. Therefore, the violation of the assumption of homoscedasticity does not appear to invalidate the results of the original analysis.

### *Future Directions*

In addition to addressing these limitations, future research may focus on a number of questions raised by the current investigation. Although our self-report measures indicate that hoarding and scrupulosity are associated with a tendency to experience guilt and shame, assessment of these emotions in vivo during clinically relevant-situations would help to confirm this finding and help to identify specific triggers of these emotions. Similarly, it would be useful to examine whether sentimental moral orientation beliefs vary between situations that are specific to these disorders and those that are not. For example, individuals who hoard may address moral questions about saving differently than they address other moral questions, and individuals with scrupulous OCD may hold specific beliefs about the morality of their compulsions that differ from their other moral beliefs. In terms of the influence of cognitive rigidity, future research could examine the extent to which individuals with these disorders differ from healthy individuals when generating alternatives and considering consequences to actual moral situations, as compared to the use of self-report measures and unrealistic philosophical dilemmas. Additionally, it might be useful to determine if other neuropsychological deficits, such as the deficits in sustained attention believed to influence hoarding, contribute to decreased rational deliberation and increased emotional reasoning in moral matters.

### *Conclusion*

The current study was the first to examine factors that explain the relationship between hoarding and scrupulosity. Results showed that these conditions are

associated with a tendency to experience intense guilt and shame, to value these emotions as important information in evaluations of right and wrong, and to have difficulty overriding these emotionally driven intuitions through rational deliberation about the consequences of moral decisions. Although replication is needed to further support these findings, these data provide an intriguing perspective on moral issues in hoarding and scrupulosity and point to potential enhancements to treatments for both disorders.



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## Appendices

### Appendix 1 - Consent Form

#### Beliefs and Attitudes related to OC Spectrum Symptoms

You are being invited to participate in an anonymous research study being conducted by researchers at Nova Southeastern University and University of Miami.

To participate you must be at least 18 years of age.

The purpose of this research study is to gather information about thoughts and feelings connected to morality, obsessive-compulsive symptoms, and hoarding symptoms. You will be asked questions regarding your thoughts, feelings, day-to-day behaviors, and spiritual/religious beliefs. The research study will take approximately 30-60 minutes to complete.

Responses are completely anonymous. You will not be asked to provide identifying information as part of the research study and the computer system through which this research study is being administered to you (Redcap) will not collect or store any information related to your identity, including computer IP addresses. Therefore, all data will remain completely confidential and anonymous.

The only risks to participation are that some questions in the research study could make you feel bored or upset in some way. You can choose to not answer any question and you may stop at any time.

If you have any further questions, please feel free to contact:

Keith Lit: kl676@nova.edu  
Jedidiah Siev, PhD: js3088@nova.edu  
Or call: 954-262-5809

Your participation is greatly appreciated.



**Appendix 2 - The Guilt Inventory – Moral Standards Subscale & Moral Rigidity Variable**

(Kugler & Jones, 1992)

Items not included in the Moral Rigidity variable

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- 3. I have always believed strongly in a firm set of moral-ethical principles.
  - 7. My goal in life is to enjoy it rather than to live up to some abstract set of moral principles.\*
  - 11. There are only a few things I would never do.\*
  - 13. My ideas of right and wrong are quite flexible.\*
  - 15. There are many things I would just never do because I believe they are wrong.
  - 22. In certain circumstances, there is almost nothing I wouldn't do.\*
  - 24. I would rather die than commit a serious act of wrongdoing.
  - 25. I feel a strong need to live up to my moral values.
  - 32. I never worry about what I do; I believe life will take care of itself.\*
  - 38. I am immediately aware of it when I have done something morally wrong.
- 

Items included in the Moral Rigidity variable

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- 1. I believe in a strict interpretation of right and wrong.
  - 18. Morality is not as "black and white" as many people would suggest.\*
  - 28. I believe that you can't judge whether something is right or wrong without knowing the motives of the people involved and the situation in which they are acting.\*
  - 39. What is right or wrong depends on the situation.\*
  - 42. I believe that moral values are absolute.
- 

Response options:

(1) strongly agree (2) agree (3) undecided (4) disagree (5) strongly disagree

\* = Item is reverse scored.

### Appendix 3 - Moral Orientation Scale

Conway, Love, & Mottner (2015)

**Instructions:** Please indicate how much you agree or disagree with the following statements. There is no right or wrong answer; we are simply interested in your personal opinion.

Response scale: 1 = *Strongly disagree* – 7 = *Strongly agree*

#### Affective Orientation

1. Unethical behavior does not bother me. (*Reversed*)
2. It upsets me when people do something unethical.
3. I tend to get upset when I see someone cheating.
4. When I think of people getting hurt it makes me upset.
5. I cringe when I see someone get injured.
6. I tend to feel strong emotions when someone behaves unethically.
7. Other people's pain is very real to me.

#### Deliberative Orientation

8. When people disagree over ethical matters, I strive for workable compromises.
9. When thinking of ethical problems, I try to develop practical, workable alternatives.
10. Ethical decisions are best made on a case by case basis.
11. When people disagree over ethical matters I strive for some points of agreement.
12. When faced with an ethical dilemma people should focus on results.
13. It is of value to societies to be responsive and adapt to new conditions as the world changes.
14. When thinking through ethical problems, I try to make reasonable distinctions and clarifications.

#### Rule Orientation

15. When faced with an ethical dilemma people should focus on rules.
16. A person's actions should be described in terms of being right or wrong.
17. A person's actions should be described in terms of being good or bad.
18. It upsets me when I see someone doing something that is impure.
19. Societies should follow stable traditions and maintain a distinctive identity.
20. Ethical decisions are best made by following a predefined set of rules.
21. Uttering a falsehood is wrong because it wouldn't be right for anyone to lie.

#### Sentiment Orientation

22. In matters of morality, heart is more important than your head.
23. I tend to follow my heart rather than my head when faced with an ethical dilemma.

24. Empathy is more important than logic when faced with an ethical dilemma.
25. I admire people who experience emotion when considering ethical dilemmas.
26. To do the right thing you must follow your heart.
27. When making ethical decisions, I trust my heart to be my guide.
28. Without emotion, it would be very hard to make the right decision when faced with an ethical dilemma.

**Appendix 4 - Anticipated Guilt Scale**  
(Roseman et al., 1994)

Please read the following scenario:

A typical Saturday... You are in a retail shop doing your weekly shopping. At the checkout you are not able to pay the exact amount. When receiving the change, you notice the cashier made a mistake and gives you too much change.

Rate the statements below using the following scale:  
(1) not at all (2) very little (3) somewhat (4) much (5) very much

If I did not report the mistake and instead pocketed the change...

1. I would feel tension.
2. I would feel remorse.
3. I would think that I was in the wrong.
4. I would think that I shouldn't have done what I did.
5. I would feel like undoing what I have done.
6. I would feel like punishing myself.
7. I would apologize.
8. I would avoid meeting people's gaze.
9. I would want to make up for what I have done wrong.
10. I would want to be forgiven.

**Appendix 5 - Guilt and Shame Proneness Scale**

(Cohen et al., 2011)

*Instructions:* In this questionnaire you will read about situations that people are likely to encounter in day-to-day life, followed by common reactions to those situations. As you read each scenario, try to imagine yourself in that situation. Then indicate the likelihood that you would react in the way described.

*(1) Very Unlikely (2) Unlikely (3) Slightly Unlikely (4) About 50% Likely (5) Slightly Likely (6) Likely (7) Very Likely*

1. After realizing you have received too much change at a store, you decide to keep it because the salesclerk doesn't notice. What is the likelihood that you would feel uncomfortable about keeping the money?
2. You are privately informed that you are the only one in your group that did not make the honor society because you skipped too many days of school. What is the likelihood that this would lead you to become more responsible about attending school?
3. You rip an article out of a journal in the library and take it with you. Your teacher discovers what you did and tells the librarian and your entire class. What is the likelihood that this would make you would feel like a bad person?
4. After making a big mistake on an important project at work in which people were depending on you, your boss criticizes you in front of your coworkers. What is the likelihood that you would feign sickness and leave work?
5. You reveal a friend's secret, though your friend never finds out. What is the likelihood that your failure to keep the secret would lead you to exert extra effort to keep secrets in the future?
6. You give a bad presentation at work. Afterwards your boss tells your coworkers it was your fault that your company lost the contract. What is the likelihood that you would feel incompetent?
7. A friend tells you that you boast a great deal. What is the likelihood that you would stop spending time with that friend?
8. Your home is very messy and unexpected guests knock on your door and invite themselves in. What is the likelihood that you would avoid the guests until they leave?

9. You secretly commit a felony. What is the likelihood that you would feel remorse about breaking the law?
10. You successfully exaggerate your damages in a lawsuit. Months later, your lies are discovered and you are charged with perjury. What is the likelihood that you would think you are a despicable human being?
11. You strongly defend a point of view in a discussion, and though nobody was aware of it, you realize that you were wrong. What is the likelihood that this would make you think more carefully before you speak?
12. You take office supplies home for personal use and are caught by your boss. What is the likelihood that this would lead you to quit your job?
13. You make a mistake at work and find out a coworker is blamed for the error. Later, your coworker confronts you about your mistake. What is the likelihood that you would feel like a coward?
14. At a coworker's housewarming party, you spill red wine on their new cream-colored carpet. You cover the stain with a chair so that nobody notices your mess. What is the likelihood that you would feel that the way you acted was pathetic?
15. While discussing a heated subject with friends, you suddenly realize you are shouting though nobody seems to notice. What is the likelihood that you would try to act more considerately toward your friends?
16. You lie to people but they never find out about it. What is the likelihood that you would feel terrible about the lies you told?

**GASP SCORING:** The GASP is scored by summing or averaging the four items in each subscale.

*Guilt-Negative-Behavior-Evaluation (NBE): 1, 9, 14, 16*

*Guilt-Repair: 2, 5, 11, 15*

*Shame-Negative-Self-Evaluation (NSE): 3, 6, 10, 13*

*Shame-Withdraw: 4, 7, 8, 12*

**Appendix 6 - Cognitive Flexibility Scale**  
(Martin & Rubin, 1995)

Instructions: The following statements deal with your beliefs and feelings about your own behavior. Read each statement and respond by circling the number that best represents your agreement with each statement.

(6) Strongly Agree (5) Agree (4) Slightly Agree (3) Slightly Disagree (2) Disagree  
(1) Strongly Disagree

1. I can communicate an idea in many different ways.
2. I avoid new and unusual situations. \*
3. I feel like I never get to make decisions. \*
4. I can find workable solutions to seemingly unsolvable problems.
5. I seldom have choices when deciding how to behave. \*
6. I am willing to work at creative solutions to problems.
7. In any given situation, I am able to act appropriately.
8. My behavior is a result of conscious decisions that I make.
9. I have many possible ways of behaving in any given situation.
10. I have difficulty using my knowledge on a given topic in real life situations.\*
11. I am willing to listen and consider alternatives for handling a problem.
12. I have the self-confidence necessary to try different ways of behaving.

\* = Item is reverse scored.

**Appendix 7 - Cognitive Flexibility Inventory**

(Dennis &amp; Vander Wal, 2010)

Please use the scale below to indicate the extent to which you agree or disagree with the following statements.

Strongly disagree	Disagree	Somewhat agree	Neutral	Somewhat agree	Agree	Strongly agree
1	2	3	4	5	6	7

1. I am good at “sizing up” situations.
2. I have a hard time making decisions when faced with difficult situations.\*
3. I consider multiple options before making a decision.
4. When I encounter difficult situations, I feel like I am losing control.\*
5. I like to look at difficult situations from many different angles.
6. I seek additional information not immediately available before attributing causes to behavior
7. When encountering difficult situations, I become so stressed that I cannot think of a way to resolve the situation.\*
8. I try to think about things from another person’s point of view.
9. I find it troublesome that there are so many different ways to deal with difficult situations.\*
10. I am good at putting myself in others’ shoes.
11. When I encounter difficult situations, I just don’t know what to do.\*
12. It is important to look at difficult situations from many angles.
13. When in difficult situations, I consider multiple options before deciding how to behave.
14. I often look at a situation from different viewpoints.
15. I am capable of overcoming the difficulties in life that I face.\*
16. I consider all the available facts and information when attributing causes to behavior.
17. I feel I have no power to change things in difficult situations.\*
18. When I encounter difficult situations, I stop and try to think of several ways to resolve it.
19. I can think of more than one way to resolve a difficult situation I’m confronted with.
20. I consider multiple options before responding to difficult situations.

\* = Item is reverse scored.