The role of emotion regulation in compulsive hoarding

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Abstract

Hoarding disorder is a disabling condition associated with significant health risks, and social, occupational, and economic impairment. While the cognitive-behavioural model of compulsive hoarding largely explains the phenomenology of hoarding, and treatments based on this conceptualisation demonstrate effectiveness in reducing hoarding symptoms, ongoing research on etiological and maintenance factors is required to improve the understanding and treatment of this disorder. One such avenue for ongoing research is the domain of emotional experience and regulation. The current project aimed to investigate whether emotion regulation (ER) difficulties are implicated in compulsive hoarding. To this end, three studies were conducted. Study 1 was a pilot investigation of ER difficulties and two emotion-based facets of impulsivity (i.e., negative and positive urgency) in relation to hoarding in a non-clinical sample ($N = 199$; $M$ age = 28.43; $SD = 11.42$). Results indicated that overall ER difficulties were significantly associated with hoarding symptoms and beliefs, and significantly predicted difficulty discarding, acquisition, and total hoarding symptoms, even after controlling for relevant covariates (i.e., general depressive and non-hoarding obsessive-compulsive symptoms). Both negative and positive urgency were also found to be significantly associated with hoarding symptoms and beliefs, although negative urgency was found to be the prominent predictor of hoarding symptoms. Study 1 also established that the ER-hoarding relationship was partially mediated by beliefs regarding emotional attachment to possessions. Study 2 largely replicated the findings of Study 1 in an independent non-clinical study ($N = 178$; $M$ age = 25.06; $SD = 10.05$). Study 2 also investigated the relationships between hoarding phenomena and additional ER constructs. In contrast to expectation, the use of cognitive reappraisal and expressive suppression strategies were not significantly associated with hoarding symptoms. However, experiential avoidance and alexithymia were both significantly associated with hoarding symptoms and beliefs, and significantly predicted hoarding symptoms after controlling for covariates. Furthermore, the relationship between alexithymia and hoarding was fully mediated by experiential avoidance. Study 3 was designed as a pilot investigation of ER in a clinical hoarding sample utilising a qualitative design ($N = 11$), and aimed to explore the experience of emotion and the emotional regulatory efforts of individuals with clinically significant hoarding symptoms. The quantitative measures
from Study 2 were also administered, and revealed that compared to a sample of similarly aged non-clinical participants from Study 2, clinical participants had significantly higher scores on ER measures of experiential avoidance and alexithymia. Prominent themes from the qualitative analysis were generally consistent with the results of the previous two studies, and provided support for the presence of ER difficulties in hoarding. In particular, difficulties with identifying and describing feelings, unhelpful attitudes towards the emotional experience, the use of avoidance-based strategies which serve an experientially avoidant function, and a perceived lack of effective strategies for regulating emotions were prominent themes. Furthermore, emotional factors were identified as being associated with the onset and/or exacerbation of hoarding behaviour, and possessions and acquiring behaviour appeared to serve an ER function. Overall, across three independent studies, the current project found support for the role of various aspects of emotion dysregulation in relation to hoarding behaviour. As such, this project highlights the importance of examining ER abilities in individuals with hoarding difficulties, and emphasises the need to incorporate ER interventions within clinical treatments for hoarding disorder.
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Declaration

I declare that this thesis contains no material which has been accepted for the award to the candidate of any other degree or diploma, except where due reference is made in the text of the examinable outcome.

To the best of my knowledge, this thesis contains no material previously published or written by another person except where due reference is made in the text of the examinable outcome.

Where the work is based on joint research or publications, the relative contributions of the respective workers or authors are disclosed.

I further declare that the research reported in this thesis was approved by Swinburne University’s Human Research Ethics Committee and Deakin University’s Human Research Ethics Committee, and that the ethical principles and procedures specified by the committees have been adhered to in the process of conducting this research.

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Jasmine Taylor
3rd March 2017
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Compulsive hoarding refers to the persistent acquisition of and failure to discard possessions regardless of their actual value, resulting in clutter that prevents living spaces from being used for their intended purpose, and causing significant distress or impairment for the individual (Frost & Hartl, 1996). Recently recognised as a discrete psychiatric disorder, hoarding disorder (American Psychiatric Association, 2013) is a debilitating condition associated with significant health risks (Frost, Steketee, & Williams, 2000), and social, occupational, and economic impairment (Tolin, Frost, Steketee, & Fitch, 2008; Tolin, Frost, Steketee, Gray, & Fitch, 2008). The prominent model for understanding hoarding disorder identifies cognitive and behavioural factors in the development and maintenance of hoarding symptomatology (Frost & Hartl, 1996; Steketee & Frost, 2003). While treatments based on the cognitive-behavioural model of compulsive hoarding have been shown to be effective in reducing hoarding symptoms (for reviews, see Muroff, Bratiotis, & Steketee, 2011; Steketee, 2014), there is room for improvement as post-treatment scores still tend to be closer to the clinical range than the normal range (Tolin, Frost, Steketee, & Muroff, 2015). As such, ongoing research on the underlying etiological and maintaining factors and associated causal pathways is needed, which may reveal other factors (not only cognitive or behavioural) that are relevant for the understanding and treatment of hoarding disorder (Kyrios, 2014).

One avenue that has received less empirical attention than cognition and behaviour in relation to hoarding behaviour is the emotional domain. While the cognitive-behavioural model of compulsive hoarding identifies the role of negative and positive emotions in hoarding behaviours, a noted criticism of cognitive-behavioural models is the tendency to view emotion as arising from associated thoughts and behaviours, which may fail to recognise fundamental disturbances in the way individuals experience and respond to their emotions in general (Campbell-Sills & Barlow, 2007). At the commencement of this project, the area of emotional processing and regulation in compulsive hoarding had received little empirical attention, and it was unknown whether difficulties in understanding and regulating emotions are implicated in hoarding behaviour.

Emotion regulation is considered to be a transdiagnostic process (Barlow, Allen, & Choate, 2004; Werner & Gross, 2010) with research demonstrating that emotion regulation difficulties are implicated in a wide range of psychiatric disorders (Berking &
Wupperman, 2012; Hu et al., 2014). The aim of this research project was to investigate the role of emotion regulation, as conceptualised and measured by several constructs, in relation to hoarding phenomena, utilising a mixed-methodology. The first study was a questionnaire-based study, designed as a pilot investigation of emotion regulation difficulties and emotion-based facets of impulsivity (i.e., negative and positive urgency) in relation to hoarding symptoms and cognitions in a non-clinical sample. In addition, this study aimed to examine an important component of the cognitive-behavioural model of compulsive hoarding (i.e., beliefs about possessions) in the relationship between emotion regulation difficulties and hoarding. A second questionnaire-based investigation aimed to replicate the findings from Study 1 in an independent non-clinical sample, and aimed to explore the relationships between hoarding phenomena and additional emotion regulation constructs (i.e., alexithymia, experiential avoidance, and the use of expressive suppression and cognitive reappraisal strategies). Furthermore, Study 2 aimed to analyse the respective contributions of multiple ER facets in the prediction of hoarding, and investigate how some of these ER constructs may be related to one another in predicting hoarding symptoms. Finally, to expand on the findings from the first two non-clinical studies, Study 3 was designed as a pilot investigation of emotion regulation in a clinical hoarding sample. This study aimed to explore how individuals with clinically significant hoarding symptoms experience and understand their emotions, their attempts at regulating their emotions, and how aspects of their hoarding behaviour might serve an emotion regulatory function. As such, Study 3 was predominantly a qualitative investigation, and utilised in-depth interviews to obtain a rich and detailed understanding of individuals’ experiences and perceptions in these areas. In addition, the clinical participants completed the questionnaire measures from Study 2, and the data was compared to an age-matched sample from Study 2.

This thesis contains nine chapters, including this current overview (Chapter 1). A review of the literature that informed the current research project and provides the basis for the three studies of the current project is presented in Chapters 2 to 4. Specifically, Chapter 2 presents background information on compulsive hoarding and Chapter 3 reviews the theory and empirical research on emotion regulation. Chapter 4 commences with a theoretical rationale for this research area, followed by a review of the empirical research conducted, to date, on emotion regulation constructs in relation to hoarding behaviour. Chapter 5 provides an overview of the current research project,
including the overall project study design and aims of each of the three studies. The first two quantitative studies are presented in Chapters 6 and 7 respectively, and the qualitative study is presented in Chapter 8. A general discussion of the entire research project is presented in Chapter 9, which summarises the major findings across the three studies, and discusses the theoretical and clinical implications of these findings. This chapter also evaluates the methodological and theoretical limitations of the current project, and proposes directions for future research in the area of emotion regulation and compulsive hoarding.
Chapter 2: Compulsive Hoarding

Collecting and saving is a widespread human behaviour. From an evolutionary perspective, the amassing of goods can be considered an adaptive behaviour for survival when resources become scarce (Grisham & Barlow, 2005; Preston, 2014). According to James (1918), the acquisitive desire is a basic human instinct, and most young children have a collection of some sort (Evans et al., 1997; Zohar & Felz, 2001). Individuals are rewarded, both financially and in terms of social recognition, for saving valuable possessions (e.g., art, antiques) and for managing to acquire, organise, and display a complete collection (e.g., figurines, coins, trading cards) (Grisham & Barlow, 2005). However, like most human behaviours, collecting and saving can vary between normal or adaptive to excessive or pathological (Mataix-Cols, Pertusa, & Snowdon, 2011). For individuals who compulsively hoard, there is a powerful urge to acquire and save possessions, which can result in high levels of clutter in the home and cause distress and impairment to daily living and personal functioning (Frost & Gross, 1993; Frost & Hartl, 1996).

Historical Background

Hoarding behaviours occur naturally in several species of nonhuman animals, in the form of food storing which is adaptive for survival (Andrews-McClymont, Lilienfeld, & Duke, 2013; Preston, 2014). As hoarding behaviour is present in a host of animal species such as rodents, monkeys, and birds, there are evolutionary approaches to understanding the behaviour in humans which are derived from research on food storing and nesting behaviour and biological theories on site-secure larder hoarding (see Kellett, 2007; Preston, 2014). A detailed exploration of animal models of hoarding is outside the scope of the current thesis; however, for detailed reviews please see Andrews-McClymont, Lilienfeld, and Duke (2013), and Preston (2014).

In humans, hoarding behaviour appears to have existed for centuries in one form or another, dating back approximately 10,000 years to our early hunter-gatherer ancestors who stored and hid supplies from other humans and animals (for a review, see Penzel, 2014). Throughout history, hoarding has taken on a different forms and purposes across different cultures and eras (Penzel, 2014), however hoarding behaviour appears to be a universal phenomenon evident across the globe (Steketee & Frost,
The nature of ownership has a long philosophical history dating back to Plato in the fourth century B.C.E., and hoarding is mentioned in literature as far back as the fourteenth century (see Frost & Steketee, 2010; Penzel, 2014).

However, empirical research on hoarding has a relatively short history, with few studies published in the mental health literature prior to 1993 (Frost, Steketee, & Tolin, 2012). Hoarding was first described as a character trait in early twentieth century psychoanalytic literature. Freud (1908) theorised that the anal personality type was characterised by a constellation of three traits, or the “anal triad”: obstinacy, orderliness, and parsimony. The latter leg of the triad included the hoarding of money, which Freud conceived to be a symbolic representation of fecal retention, and Jones (1912) later extended upon this idea by proposing that the parsimony leg included the hoarding of objects. By the middle of the twentieth century, Fromm (1947) had developed a theory of character, postulating that “a hoarding orientation” was one of four types of “non-productive” character. He maintained that individuals with a “hoarding orientation” derive a sense of security and safety from amassing and saving things, and described such individuals as withdrawn, suspicious, compulsive, orderly, and overly preoccupied with punctuality and cleanliness (Fromm, 1947). Similarly, Salzman (1973) regarded hoarding as a way of exerting control over one’s environment in order to create a sense of security.

While some individual cases of hoarding behaviour have been described in the psychological literature (e.g., Frankenburg, 1984; D. Greenberg, 1987), there was no systematic definition or investigation of hoarding until the early 1990’s when it was first defined as “the acquisition of and failure to discard a large number of possessions which appear to be useless or of limited value” (Frost & Gross, 1993, p. 367). This definition was later extended upon in order to distinguish hoarding behaviour from clinically significant hoarding, with the latter being defined as: “(1) the acquisition of, and failure to discard a large number of possessions that appear to be useless or of limited value; (2) living spaces sufficiently cluttered so as to preclude activities for which those spaces were designed, and (3) significant distress or impairment in functioning caused by the hoarding” (Frost & Hartl, 1996, p. 341). Since then, the level of interest in and attention to hoarding behaviour has significantly escalated, both in terms of empirical research and in popular culture (Mataix-Cols et al., 2010).
Diagnostic Features

Historically, hoarding has been considered a feature of obsessive-compulsive personality disorder (OCPD), or as a symptom or subtype of obsessive-compulsive disorder (OCD). However, an expanding body of knowledge on symptom phenomenology, genetic profile, neurobiological substrates, comorbidity profile, cognitive-behavioural processes, impact and disability, and treatment response suggests that hoarding is a discrete diagnostic entity, separate from both OCPD and OCD (for detailed reviews, see Mataix-Cols et al., 2010; Pertusa et al., 2010; Rachman, Elliott, Shafran, & Radomsky, 2009; S. Saxena, 2008). Consequently, hoarding disorder (HD) was officially recognised as an independent psychiatric disorder and included under the ‘Obsessive-Compulsive and Related Disorders’ chapter of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association [APA], 2013).

In order to fulfil a diagnosis of HD, all six of the following diagnostic criteria must be met. Criterion A refers to the central feature of HD, a “persistent difficulty discarding or parting with possessions, regardless of their actual value” (APA, 2013, p. 247). The difficulty is not limited to throwing things away, but refers to any attempt to discard possessions, including recycling, selling, or giving them away (Frost et al., 2012). The term ‘persistent’ distinguishes long-standing difficulties with discarding from other transient life circumstances that may result in excessive clutter, such as inheriting property after the death of a loved one or moving house (Mataix-Cols & Fernández de la Cruz, 2014). The most frequently hoarded items are newspapers, magazines, old clothing, books, bags, paperwork, letters, receipts, and bills (Frost & Gross, 1993; Mogan, Kyrios, Schweitzer, Yap, & Moulding, 2012; Pertusa et al., 2008), which when accumulated may appear worthless or of limited value to an outside observer. However, hoards are commonly a mixture of valuable as well as worthless items (Frost et al., 2012) with some items still having price tags attached or in their original packaging (Frost & Hartl, 1996).

Individuals may have difficulty discarding items because of the perceived instrumental or aesthetic value of items (Frost et al., 2012), or a sentimental attachment to possessions that may be associated with a significant event, person, place, or time (Frost, Hartl, Christian, & Williams, 1995). Individuals with and without hoarding difficulties report these same main reasons for why they save items (Frost & Gross,
1993), although they differ in terms of the quantity and variety of objects they assign these values to (Frost et al., 2012). Saving behaviour is also related to feeling responsible for possessions, which may manifest as concern that harm may come to their possessions, a need to carry a large number of items to be prepared (i.e., “just in case”), not wanting to waste something that still has a possible use, and feelings of guilt for discarding something (Frost & Gross, 1993; Frost & Hartl, 1996; Steketee, Frost, & Kyrios, 2003). Fears of losing important information is another common motive for saving behaviour, and often possessions are kept in sight as visual memory aids (Hartl et al., 2004; Steketee et al., 2003). Research also suggests that individuals who hoard have an excessive desire for control over their possessions, are less willing to share their possessions or to have others touch or move their possessions, and commonly experience intense emotional reactions as a result of unauthorised touching (Frost et al., 1995; D. Greenberg, 1987).

Criterion B specifies that the difficulty discarding is “due to a perceived need to save the items and to distress associated with discarding them” (APA, 2013, p. 247). This criterion refers to deliberate and intentional saving behaviour and the associated distress with discarding (Frost et al., 2012), which distinguishes HD from other forms of psychopathology that are represented by the passive accumulation of items or a lack of distress associated with the removal of possessions, such as organic brain disorders or dementia (Mataix-Cols & Fernández de la Cruz, 2014).

Criterion C pertains to the most visible symptom of HD - clutter, which occurs as a direct result of Criterion A and B. Clutter is defined as “a large group of usually unrelated or marginally related objects piled together in a disorganised fashion in spaces designed for other purposes (e.g., table tops, floor, hallway)” (APA, 2013, p. 248). This criterion refers to cluttered “active” living areas as opposed to more peripheral areas of the home (e.g., garages, attics, basements) that may also be cluttered in the homes of individuals without HD (APA, 2013; Frost et al., 2012). In order to meet this criterion, the individual’s ability to use active living areas of the home for their intended use must be substantially compromised. For example, a person meeting HD criteria may be unable to cook in their kitchen, have a bath/shower, or sleep in his or her bed. If the living area can be used, it is only with great difficulty. Often, individuals with HD have clutter that spreads beyond the active living spaces and compromises other areas such as yards, gardens, vehicles, workplaces, and the homes of other friends and relatives.
Criterion C also allows for a diagnosis to be applied to individuals who have uncluttered living spaces due to the intervention of family members or local authorities, given that their homes are likely to fill up with clutter after the external influence is gone (Mataix-Cols & Fernández de la Cruz, 2014). The condition of the homes of individuals with HD can range from somewhat cluttered to neglected and characterised by squalor (H. J. Kim, Steketee, & Frost, 2001).

Criterion D is met when hoarding symptoms (i.e., difficulties discarding and/or clutter) cause clinically significant distress for the individual or impairment in functioning in various domains of their life (e.g., social, occupational, safety). In some instances, individuals may not report distress. This is particularly in the case for those with poor insight, and the impairment may only be evident to others. However, any attempt to discard or remove possessions by third parties will cause a high level of distress for the individual (APA, 2013). Hoarding is associated with impaired functioning in a range of areas (discussed later under functional consequences).

Criterion E and F refer to differential diagnosis. Given that hoarding symptoms can be evident in a range of organic and psychiatric conditions, other medical and mental disorders must be ruled out in order to give a diagnosis of HD (APA, 2013). For example, research shows that patients with damage to the anterior ventromedial prefrontal and cingulate cortices exhibit excessive acquisition behaviours, which were not present prior to injury, but appeared shortly after injury (Anderson, Damasio, & Damasio, 2005; Mataix-Cols et al., 2011). Hoarding behaviours are also seen in individuals with genetic conditions such as Prader-Willi syndrome, neurocognitive disorders such as frontotemporal lobar degeneration or Alzheimer’s disease, neurodevelopmental disorders such as autism spectrum disorder or intellectual developmental disorder, and psychiatric conditions such as schizophrenia, OCD, and major depressive disorder (for a review, see Pertusa & Fonseca, 2014). In such cases, a diagnosis of HD would be ruled out as the hoarding behaviour would be considered secondary to the medical or psychiatric condition. In some cases, both a diagnosis of OCD and HD may be given, when the hoarding appears concurrently with other characteristic symptoms of OCD (APA, 2013; Mataix-Cols et al., 2010).

For individuals fulfilling a diagnosis of HD, two specifiers need to be coded. The first specifier refers to whether the “difficulty discarding possessions is accompanied by excessive acquisition of items that are not needed or for which there is
no available space” (APA, 2013, p. 247). Among individuals who hoard, approximately 80% to 90% are believed to have excessive acquisition behaviours, with excessive buying being the most common form, followed by the acquisition of free things (Frost, Rosenfield, Steketee, & Tolin, 2013; Frost, Steketee, & Tolin, 2011; Frost, Tolin, Steketee, Fitch, & Selbo-Bruns, 2009; Mataix-Cols, Billotti, Fernández de la Cruz, & Nordsletten, 2013). Stealing is a third form of acquisition, although it is far less common (Frost, Steketee, et al., 2011). Compared to individuals without self-reported excessive acquisition behaviour, individuals with acquiring problems tend to have more severe hoarding symptoms including clutter, difficulty discarding, distress, and interference (Frost et al., 2013; Frost et al., 2009; Timpano, Exner, et al., 2011). Furthermore, those who participate in both excessive buying and the free acquisition of things typically have more severe hoarding symptoms compared to those who use only one method of acquisition (Frost et al., 2009). Excessive acquisition is included as a specifier for HD rather than a key criterion given that a significant minority of individuals with HD do not have excessive acquisition behaviours (Timpano, Exner, et al., 2011).

The second specifier refers to an individual’s level of insight or awareness that their hoarding-related beliefs and behaviours are problematic, and can be rated as either “good/fair”, “poor”, or “absent/delusional” (APA, 2013). One of the most astounding features of HD is that despite clear evidence, some individuals are unable to recognise that they have a problem. They can be seemingly ‘blind’ to the degree of clutter, and appear oblivious to the consequences of their behaviour such as the detrimental effects on self and family members, health and safety consequences, and impairment to living (Mataix-Cols & Fernández de la Cruz, 2014). Indeed, family members, clinicians, social workers, and health officers tend to rate the individuals they are in contact with as having “poor insight” or as “lacking insight/delusional” (Frost et al., 2000; H. J. Kim et al., 2001; Tolin, Fitch, Frost, & Steketee, 2010). However, research shows that individuals with hoarding difficulties vary in their level of insight, which in turn is likely to impact on their motivation to seek help and their adherence to treatment (Tolin, Fitch, et al., 2010). For example, the majority of participants who volunteer for research studies appear to have reasonably good or fair insight (Mataix-Cols et al., 2013; Tolin, Frost, Steketee, & Fitch, 2008), while participants referred by third parties tend to be reluctant to acknowledge their behaviour is problematic and may refuse treatment (for a
review, see Worden, DiLorento, & Tolin, 2014). This specifier is important as treatment approaches may well differ depending on the individual’s degree of insight (Mataix-Cols & Fernández de la Cruz, 2014).

While it is not a specifier for HD criteria, animal hoarding may be a subtype of HD which shares similar symptoms to the hoarding of possessions, although it appears to produce more detrimental consequences to the individual, animals, and home environment (for a review of animal hoarding, see Patronek & Ayers, 2014). Likewise, up to a third of individuals meeting criteria for HD may live in squalor (for a review on severe domestic squalor, see Norberg & Snowdon, 2014). The presence of either of these features increases the severity of the condition, and will necessitate additional and/or modified interventions.

Comorbidity

Many individuals with HD also meet diagnostic criteria for other psychiatric disorders, however most studies on comorbidity have been hindered by methodological issues such as using non-validated hoarding assessments and recruiting participants from OCD samples (Frost et al., 2012), and comorbidity patterns may differ for males and females (for a discussion, see Wheaton & Van Meter, 2014).

Although HD and OCD are now considered separate disorders, they can, and do, occur together. In OCD samples, hoarding symptoms are relatively common with rates ranging from 20% to 40%, while the rates of OCD in samples recruited specifically for hoarding difficulties are less than 20% (for a review, see Wheaton & Van Meter, 2014). However, the most common diagnosis found among HD individuals is major depressive disorder (MDD), occurring in over 50% of participants, which is not surprising given the distress and impairment associated with hoarding symptoms (Frost, Steketee, et al., 2011; Tolin, Stevens, et al., 2012). Research also suggests that 50% of participants in hoarding samples have at least one comorbid anxiety disorder, the most frequent being generalised anxiety disorder (GAD) (24.4%) and social phobia (23.5%) (Frost, Steketee, et al., 2011). Hoarding is also associated with attention-deficit/hyperactivity disorder (ADHD), at rates of 27.8% for the inattentive type and 13.7% for the hyperactive type (Frost, Steketee, et al., 2011).

Impulse control disorders (ICDs) have often been associated with HD. For example, in a large community sample approximately two thirds of participants
categorised with hoarding also suffered from compulsive buying, traditionally considered an ICD not elsewhere specified (Mueller, Mitchell, Crosby, Glaesmer, & de Zwaan, 2009), and hoarding has been found to be as strongly correlated with compulsive buying as it is with OCD symptoms (Hayward & Coles, 2009). Frost, Steketee, et al. (2011) found that approximately 60% of participants with HD experienced problems with compulsive buying and the acquisition of free things, and almost 10% also experienced problems with kleptomania. Furthermore, research suggests that HD may be associated with other problematic impulse control behaviours such as skin picking, trichotillomania, and nail biting (Samuels et al., 2002). While some research has found that pathological gamblers report significantly more hoarding symptoms and compulsive buying compared to light gamblers (Frost, Meagher, & Riskind, 2001), other research has found no significant correlation between a measure of gambling and hoarding symptoms (Hayward & Coles, 2009).

There are mixed findings in the literature on the frequency with which HD co-occurs with bipolar spectrum disorders, substance and alcohol use disorders, and eating disorders (for a review, see Wheaton & Van Meter, 2014). Regarding personality disorders, 68% of participants with hoarding symptoms from an OCD sample also had at least one personality disorder (Samuels et al., 2002). Possibly due to diagnostic criteria overlap, the most commonly comorbid personality disorder is OCPD (56.8% in Landau et al., 2011; 45% in Samuels et al., 2002), however when the ‘inability to discard’ criterion is removed OCPD still appears to be frequently comorbid in HD (Landau et al., 2011). Other diagnoses such as avoidant and borderline personality disorder (BPD), and paranoid and schizotypal personality traits are also associated with HD (Frost, Steketee, et al., 2011; Samuels et al., 2008; Samuels et al., 2002). For a detailed review of the literature on comorbidity patterns in HD, see Wheaton and Van Meter (2014).

Prevalence

International studies suggest that the prevalence of hoarding is between 2% to 6% of the population (Bulli, Melli, Carraresi, & Stopani, 2014; Iervolino et al., 2009; Mueller et al., 2009; Samuels et al., 2008; Timpano, Exner, et al., 2011). However, one review suggests that this may be an overestimation due to sampling and varying definitions of problematic hoarding, as face to face evaluations of hoarding revealed a
lower boundary of 1.5% (Nordsletten et al., 2013). A more recent study of the prevalence of obsessive-compulsive spectrum and anxiety disorder symptoms in a large Australian adult twin sample found the prevalence rate of hoarding to be 2.6% for the total sample, 3.3% for female twins, and 1.6% for male twins (López-Solà et al., 2014), which is consistent with another large twin study conducted in the United Kingdom (2.3% for total sample; Iervolino et al., 2009). Research suggests that hoarding behaviour is a cross-cultural phenomenon, with similar features and prevalence rates across cultures (for a review, see Steketee & Frost, 2014a).

**Onset and Course**

Initial studies on the age of onset of hoarding involved OCD samples, with some research suggesting an earlier onset for individuals with OCD and hoarding symptoms compared to those with OCD and no hoarding, while other studies did not find this pattern (for a review, see Steketee & Frost, 2014a). Most of the research on samples specifically recruited for hoarding problems suggests that hoarding has an early onset, with symptoms apparent in childhood or adolescence (average age 11-15 years), although some individuals have symptom onset in their early-to-mid-twenties (Frost & Gross, 1993; Grisham, Frost, Steketee, Kim, & Hood, 2006; Tolin, Meunier, Frost, & Steketee, 2010). One study utilising a retrospective assessment of hoarding symptoms found that mild symptoms of hoarding started in middle adolescence (i.e., 60% by age 12; 80% by age 18), while symptoms reached moderate levels in the early-to-mid-twenties, and severe levels a decade later (Grisham et al., 2006). Symptoms of clutter and difficulty discarding reportedly began around the same age, while acquiring behaviours developed somewhat later (Grisham et al., 2006). Another study found that only 33% of participants reported moderate or severe hoarding by 20 years of age, while 75% reported onset of moderate or severe hoarding by age 40 (Tolin, Meunier, et al., 2010). However, other research has found later average ages of onset for initial and clinically significant symptoms (for a review, see Steketee & Frost, 2014a) and factors such as traumatic life events appear to be temporally linked with later onset (e.g., Grisham et al., 2006; Tolin, Meunier, et al., 2010; discussed further under biological and psychosocial vulnerabilities).

Hoarding appears to be a progressive and chronic condition. For example, Ayers, Saxena, Golshan, and Wetherell (2010) found that for elderly individuals with
clinically significant hoarding, the severity of symptoms increased with each decade of life. In a large internet-based study, most of the participants (73%) reported a chronic course of illness after symptom onset, while 21.2% reported increasing severity, 5.2% reported a relapsing and remitting course, and only 0.7% reported a decreasing course (Tolin, Meunier, et al., 2010). Overall, the research suggests that hoarding starts early, progressively worsens over the subsequent decade or two, and then remains fairly stable at moderate to severe levels into later life (Steketee & Frost, 2014a).

**Demographic Characteristics**

Given that the average age of an individual seeking treatment for hoarding is approximately 50 (Grisham et al., 2006), and the mean age of participants in research studies is typically between 50-60 (Steketee & Frost, 2014a), it may appear that there is an association between hoarding and older age. However, there is inconsistency in the literature, with some research on hoarding samples finding a significant correlation between age and hoarding severity (e.g., Tolin, Meunier, et al., 2010), while other research has not (e.g., Tolin, Frost, Steketee, Gray, et al., 2008). Likewise, some research on OCD samples has found hoarding severity to be correlated with age (e.g., Torres et al., 2012) while other research has found no significant age difference between OCD individuals with and without hoarding (e.g., Cromer, Schmidt, & Murphy, 2007; Wheaton, Timpano, LaSelle-Ricci, & Murphy, 2008). Most of the epidemiological research suggests that there is no significant relationship between age and hoarding (Bulli et al., 2014; Fullana et al., 2010; Mueller et al., 2009; Timpano, Exner, et al., 2011).

Several studies have reported that hoarding tends to affect more men than women, at a ratio of approximately 2:1 (e.g., Iervolino et al., 2009; Samuels et al., 2008), while some studies have found a higher prevalence of hoarding in females (e.g., López-Solà et al., 2014; Pertusa et al., 2008). However, as reviewed by Steketee and Frost (2014a), most of the research shows no significant gender differences (e.g., Bulli et al., 2014; Frost, Steketee, et al., 2011; Mueller et al., 2009; Steketee & Frost, 2014a). While some studies have found no significant marital differences for individuals who hoard (e.g., Bulli et al., 2014; Mueller et al., 2009), the majority of research suggests that individuals with hoarding difficulties are less likely to marry and more likely to live alone compared with other clinical and non-clinical individuals (Frost & Gross, 1993;
Two studies have found lower levels of education to be associated with hoarding (Landau et al., 2011; Nordsletten et al., 2013), however most of the research suggests that hoarding is not significantly associated with lower levels of education (e.g., Bulli et al., 2014; Frost, Steketee, et al., 2011; Mueller et al., 2009; Pertusa et al., 2008; Samuels et al., 2008; Timpano, Keough, et al., 2011; Torres et al., 2012; Wheaton et al., 2008). There is inconsistency in the literature about the relationship between hoarding and household income levels. Samuels et al. (2008) found the prevalence of hoarding in a community sample to be negatively associated with household income, even after controlling for age, sex, living arrangement, and current employment. Tolin and colleagues (2008) found that hoarding participants meeting diagnostic criteria were more likely to report that it was somewhat or very difficult to pay their bills than participants not meeting diagnostic criteria. Of those hoarding participants who were currently employed, 37.9% of the total hoarding sample reported receiving income levels below that year’s poverty threshold for a single individual (Tolin, Frost, Steketee, Gray, et al., 2008). Likewise, Wheaton et al. (2008) found that OCD participants with hoarding symptoms had significantly lower income levels and were more likely to fall in the lowest income bracket compared to OCD participants without hoarding symptoms. In contrast, other research has found no significant differences in monthly household income between hoarding and non-hoarding participants (Mueller et al., 2009), and between clinical OCD and hoarding samples (Frost, Steketee, et al., 2011). See Steketee and Frost (2014a) for a detailed review of the research on these demographic characteristics and hoarding.

**Functional Consequences of Hoarding**

Hoarding disorder is a serious and disabling condition that can have serious psychosocial, occupational, health, and safety consequences for the individual and his or her relatives, as well as posing a significant health and economic burden to the wider community (Frost et al., 2000; H. J. Kim et al., 2001; Lucini, Monk, & Szlatenyi, 2009; Tolin, Frost, Steketee, & Fitch, 2008; Tolin, Frost, Steketee, Gray, et al., 2008). For example, Tolin and colleagues (2008) found that hoarding participants were almost
three times more likely to be overweight or obese than their family members, and they demonstrated higher rates of medical conditions, and had a five-fold higher rate of mental health service utilisation than women in the general population. Individuals with clinically relevant hoarding miss, on average, seven work days per month, which is on par with the work impairment of individuals with bipolar disorder and schizophrenia. Hoarding also impacts on housing stability, with 8-12% of hoarding participants reporting being evicted or threatened with eviction as a result of their clutter (Tolin, Frost, Steketee, Gray, et al., 2008). Furthermore, hoarding has deleterious effects on the lives of family members, evidenced by high levels of family frustration, hostility, and rejecting attitudes (Tolin, Frost, Steketee, & Fitch, 2008; Wilbram, Kellett, & Beail, 2008).

In hoarding cases, cluttered living spaces can put individuals at increased risk for injuries due to fire and falling, and for illnesses due to poor sanitation, with these risks being an issue particularly for the elderly (Frost et al., 2000; H. J. Kim et al., 2001). For example, Kim et al. found that a large number of elderly hoarding participants had poor personal hygiene, and resided in a home environment that had an odour and was unsanitary. Of most concern, hoarding can create a number of safety hazards that can lead to the loss of life due to fire (Lucini et al., 2009). Such dangers include high fire load and blocked exits, which when combined with limited mobility in more elderly individuals, can make escaping a fire almost impossible (Frost et al., 2000; Lucini et al., 2009). In a survey of local health departments in Massachusetts, Frost et al. (2000) found that a life was lost in 6% of identified hoarding cases as a result of fire. A review of residential fires in Victoria, Australia, identified 48 hoarding-related fire incidents over a 10 year period from 1999-2009, although the researchers acknowledged that this was a significant underestimate due to poor record-keeping (Lucini et al., 2009). The review revealed that hoarding-related fires were on average more severe than ordinary fire incidents due to increased fire-loads, and therefore required more resources. For example, compared to ordinary household fires which required 7.7 firefighters to fight the fire at an average cost to the Metropolitan Fire Brigade of $2,120, a hoarding-related fire required 17.3 firefighters with an average cost of $34,100. In terms of dollar loss, the average cost of damages in a hoarding-related fire incident was $100,100, compared with the average dollar loss of $12,600 for residential fires since the year 2000. Of greatest concern, 10 of the 48 hoarding-related fire
incidents resulted in a fatality. These fatalities represented 24% of all preventable residential fire fatalities over that 10 year period (Lucini et al., 2009).

While the dollar amount of the economic burden of hoarding is unknown, there are high public costs associated with the high rate of community agency involvement in hoarding cases (Frost et al., 2000). For example, research on the frequency of hoarding complaints made to local health departments in Massachusetts found 79% of hoarding cases involved additional agencies on top of the health department, such as the fire department, the department of ageing, and mental health services, and nearly half of the cases involved two or more agencies (Frost et al., 2000). One health department spent US$16,000 in one year clearing out one house, only to be faced with the same problem 18 months later when the house was full again (Frost et al., 2000). The San Francisco Task Force on Compulsive Hoarding (2009) estimated that between 12,000 and 25,000 citizens in San Francisco have hoarding behaviours, with estimated costs to landlords and service providers of $6.43 million each year. Given the significant amount of time and resources required to address hoarding cases, many communities have formed multidisciplinary task forces (Bratiotis, 2013). At the time of publication, Bratiotis (2013) reported that there were approximately 85 hoarding task forces across the United States, Canada, and Australia, a number that has undoubtedly increased since that time, given the increasing public attention and awareness of HD.

**Etiology of Hoarding**

There are many approaches for understanding the etiology of hoarding, including genetic/biological (see Hirschtritt & Mathews, 2014), neurobiological (see Slyne & Tolin, 2014), ethological (see Preston, 2014), economic theories (see Vickers & Preston, 2014), and developmental and psychological models (see Kyrios, 2014). The scope of this thesis is limited to a discussion of the predominant psychological model (i.e., the cognitive-behavioural model of compulsive hoarding), which attributes biological and psychosocial factors to the development and maintenance of hoarding disorder.

According to the cognitive-behavioural model of hoarding (Frost & Hartl, 1996; Frost & Steketee, 1998, 2008; Steketee & Frost, 2003, 2014b), the main features of hoarding (i.e., excessive acquisition, difficulty discarding, and clutter) are thought to result from biological (e.g., genetic predisposition, neurobiological factors) and
psychosocial vulnerabilities (e.g., early experiences, negative mood, personality traits) that influence information processing (e.g., difficulties with attention, decision-making, organisation, and perception). These vulnerabilities give rise to mistaken beliefs about, and attachments to, possessions, which in turn, induce both negative and positive emotional responses, which then influence behaviour. That is, negative emotions such as anxiety, guilt, and sadness lead to avoidance behaviours (e.g., saving possessions to avoid the distress associated with discarding) and clutter, while positive emotions such as pleasure, excitement, and joy are associated with the objects themselves and acquiring behaviour. Therefore, both negative and positive emotional responses reinforce the excessive acquisition, saving, and clutter (Frost & Hartl, 1996; Frost & Steketee, 1998, 2008; Steketee & Frost, 2003, 2014b).

There is strong support for the cognitive-behavioural model of hoarding, with research from the biological, social, and psychological sciences substantiating various aspects of the model (for a detailed discussion, see Kyrios, 2014). The following section provides a brief overview of some of this research.

**Evidence for the Cognitive-Behavioural Model of Hoarding**

**Biological and psychosocial vulnerabilities.**

Research shows that hoarding has a strong familial component, suggesting a genetic vulnerability to the condition. Hoarding is more common among first-degree relatives of individuals who hoard, compared with non-hoarding controls (Frost & Gross, 1993; Pertusa et al., 2008; Samuels et al., 2007; Samuels et al., 2002; Winsberg, Cassic, & Koran, 1999) and genetic epidemiology studies also provide evidence for the heritability of hoarding. For example, in a large study of twins from the United Kingdom, hoarding was established to be highly heritable, at least in women, with genetic factors accounting for approximately half of the variance in hoarding (Iervolino et al., 2009). A recent twin study on a large sample from the Netherlands found somewhat lower rates of heritability, with genetic factors accounting for 36% of the variance in hoarding; however there was no evidence of sex differences in genetic contribution to hoarding (Mathews, Delucchi, Cath, Willemsen, & Boomsma, 2014). In contrast, a recent study on Australian twins found a higher heritability of hoarding symptoms in females (38%) compared to males (25%) (López-Solà et al., 2014). There are also promising results from research investigating genes and chromosomal regions
that may be involved in hoarding, although a discussion of this falls outside the scope of this thesis (for a review, see Hirschtritt & Mathews, 2014).

In addition to genetic and neurobiological vulnerabilities, early experiences also appear to influence the development of hoarding problems. For example, in a small case study of 15 individuals with clinically significant hoarding, participants reported that factors such as emotional deprivation in childhood, material deprivation, having a family member who hoarded, and having parents who did not allow them to keep items, contributed to their hoarding behaviour (Seedat & Stein, 2002). Hoarding participants report experiencing less emotional warmth in their families of origin than both non-hoarding OCD participants and healthy controls, and lack of warmth has been found to be a unique predictor of hoarding severity (Mogan, 2006).

While other research did not find lack of family warmth to be associated with acquisition, attachment uncertainty has been shown to be associated with the acquisition of free things even after controlling for symptoms of depression and decision-making problems (Frost, Kyrios, McCarthy, & Matthews, 2007). In addition, self-ambivalence accounted for significant variance in hoarding symptoms over and above depression and indecisiveness (Frost et al., 2007). As negative early developmental conditions are thought to impact on attachment patterns and core beliefs about the self, this increases psychological vulnerability for anxiety, depression, and obsessive-compulsive tendencies, and therefore may be implicated in the formation of strong attachments to possessions in hoarding (for discussion, see Kyrios, 2014).

Other vulnerability factors for HD include comorbid disorders (e.g., MDD, social phobia, GAD, and ADHD), and personality traits such as dependent, avoidant, and paranoid traits (Frost, Steketee, et al., 2011; Samuels et al., 2008; Samuels et al., 2007; Samuels et al., 2002). Temperamental risk factors such as perfectionism and indecisiveness have also been associated with the disorder. For example, individuals with hoarding problems score higher on measures of perfectionism compared with community controls (Frost & Gross, 1993), and perfectionism has been positively associated with hoarding severity and hoarding-related beliefs (Steketee et al., 2003). Likewise, there is an established link between indecisiveness and hoarding (Frost & Gross, 1993; Frost, Tolin, Steketee, & Oh, 2011; Samuels et al., 2007; Samuels et al., 2002). For example, in a sample recruited specifically for hoarding symptoms, indecisiveness was found to be associated with hoarding severity, and was predictive of
acquiring, difficulty discarding, and clutter even after controlling for depression, anxiety, and OCD symptoms (Frost, Tolin, et al., 2011). Furthermore, the children of adults with hoarding problems reported greater decision-making difficulties than did spouses of adults with hoarding problems, highlighting the possibility that indecision may run in families (Frost, Tolin, et al., 2011).

The experience of traumatic or stressful life events also appears to be a risk factor for hoarding behaviour. Compared to community controls, individuals with hoarding problems experience a greater number and frequency of different types of traumatic events, such as having something taken from them by force, being physically roughly handled, and experiencing forced sexual activity both before and after the age of 18 (Hartl, Duffany, Allen, Steketee, & Frost, 2005). Individuals with OCD and hoarding symptoms are significantly more likely to report at least one traumatic event in their lifetime than OCD individuals without hoarding (Cromer et al., 2007). Furthermore, hoarding behaviour and traumatic exposure has been found to be associated with greater hoarding symptom severity (even after controlling for other covariates such as depression, anxiety, or other obsessive-compulsive symptoms), with clutter being the hoarding symptom most strongly associated with exposure to traumatic life events, which suggests that clutter may provide a protective function (Cromer et al., 2007).

Several studies have found that traumatic or stressful events may be temporally linked to the onset of hoarding problems. For example, Grisham et al. (2006) found that 55% of their hoarding sample had experienced a stressful (positive or negative) life event at the onset of hoarding symptoms, and these individuals had a significantly later onset than individuals who reported no stressful event at age of onset (Grisham et al., 2006). This indicates that some individuals appear to develop hoarding behaviour in response to a stressful or traumatic life event that they have trouble coping with, while others may have a predisposition to hoarding that begins early and progressively worsens over time (Grisham et al., 2006). Regardless of the nature of onset, participants in the study did not differ in terms of the current severity of their hoarding behaviour, and few participants reported remission of hoarding symptoms over the course of their lives (Grisham et al., 2006). Tolin, Meunier, et al. (2010) also found that interpersonal violence and changes in relationships were temporally linked to symptom onset and exacerbation, with greater rates of stressful or traumatic events found for later onset
hoarding. The authors suggested that late-onset hoarding may be etiologically distinct from early-onset hoarding, with traumatic life events playing a greater role in late-onset hoarding (Tolin, Meunier, et al., 2010). Indeed, while approximately half of hoarding participants report that onset was linked to stressful life events, this is significantly less common for those participants with early-onset hoarding (Landau et al., 2011). More recently, Przeworski, Cain, and Dunbeck (2014) found that traumatic events were common in clinical groups: 89.3% in OCD alone, 97.9% in hoarding alone, and 96.2% in comorbid OCD and hoarding, although there were no significant group differences in these rates. After controlling for age and gender, hoarding severity was not associated with the number of lifetime traumatic events. However, the findings indicated that as the number of traumatic life events before symptom onset increased, so did the severity of hoarding. The authors postulated that individuals with cumulative trauma may become increasingly attached to objects, which therefore increases hoarding severity (Przeworski et al., 2014). Collectively this research suggests that for some individuals, hoarding behaviours may develop, at least in some part, as a way of seeking comfort, safety, or security in response to traumatic or stressful life events that they have had difficulty coping with.

**Information processing deficits.**

The cognitive-behavioural model of hoarding postulates that the key symptoms of hoarding occur in part as a result of information processing deficits, including impaired attention, deficits in categorisation/organisation, memory difficulties, and impaired decision-making abilities (Frost & Hartl, 1996; Frost & Steketee, 1998, 2008; Steketee & Frost, 2003, 2014b). Indeed, clinical observations reveal that individuals who hoard find it difficult to stay on task, are easily distracted, can display tangential speaking styles, rely on physical objects to allay fears about forgetting things, exhibit extreme difficulties with categorising and organising clutter, and experience high levels of indecision about what possessions to save or discard, which can be so distressing that they avoid the decision-making process altogether (Steketee & Frost, 2003; Timpano, Smith, Yang, & Çek, 2014). Support for these aspects of the cognitive-behavioural model is also provided by self-reported and neurological research, some of which is briefly outlined below.
In support of an attentional deficit in HD, research demonstrates that HD is comorbid with ADHD (Frost, Steketee, et al., 2011; Sheppard et al., 2010), and a recent review suggests that this comorbidity may, in part, be explained by shared executive functioning deficits (F. A. Lynch, McGillivray, Moulding, & Byrne, 2015). While some research has found associations between hoarding and both inattentive and hyperactive-impulsive ADHD symptoms (e.g., Grisham, Brown, Savage, Steketee, & Barlow, 2007; Hartl et al., 2005), other research suggests a stronger link between the inattentive subtype and hoarding (e.g., Frost, Steketee, et al., 2011; Sheppard et al., 2010; Tolin & Villavicencio, 2011). Specifically, the inattentive symptoms of ADHD have been found to significantly predict severity of clutter, difficulty discarding, and acquiring even after controlling for general negative affect and OCD symptoms (Tolin & Villavicencio, 2011). In particular, inattention appears to be a strong predictor of hoarding symptoms across the lifespan (Hacker et al., 2012; Tolin & Villavicencio, 2011). Some neuropsychological research has found significant impairments in sustained and spatial attention in hoarding participants compared to both community participants and mood and anxiety disorder controls (Grisham et al., 2007), while other research has found individuals with hoarding difficulties to have poorer sustained attention than healthy controls, but not OCD clinical controls (Tolin, Villavicencio, Umbach, & Kurtz, 2011). Overall, the literature suggests that hoarding is associated with attentional difficulties, although there are some inconsistent findings and methodological limitations (for reviews, see Timpano, Smith, et al., 2014; Woody, Kellman-McFarlane, & Welsted, 2014).

Other research utilising self-report measures has demonstrated that hoarding symptoms are strongly related to attentional and motor impulsivity, the tendency to engage in impulsive behaviours when experiencing negative emotions, and difficulty persevering with tasks (Phung, Moulding, Taylor, & Nedeljkovic, 2015; Timpano, Rasmussen, et al., 2013). While one neuropsychological study found that increased impulsivity and slower reaction time was significantly associated with hoarding symptoms even after controlling for depression, schizotypy, and other OCD symptoms (Grisham et al., 2007), other neuropsychological studies of impulsivity and response inhibition in relation to hoarding have shown inconsistent findings (for discussion, see Timpano, Smith, et al., 2014). A more detailed discussion of the empirical research on impulsivity and hoarding is covered in Chapter 4.
Research suggests that hoarding is associated with compromised categorisation and organisational abilities (Hartl et al., 2004; Hayward, 2011; Luchian, McNally, & Hooley, 2007; Mackin, Areán, Delucchi, & Mathews, 2011; Tolin et al., 2011; Wincze, Steketee, & Frost, 2007). For example, Luchian et al. (2007) found that compared to control participants, a sample of self-identified ‘pack rats’ rated a categorisation task as more stressful, generated more categories for items, and took longer to complete the task. Similarly, in another study where participants were asked to sort personal items, individuals with hoarding difficulties took longer and created more categories compared to healthy controls or OCD participants (Wincze et al., 2007). The role of emotion during categorisation has also been investigated, with research demonstrating that compared to non-clinical controls, individuals with hoarding problems created more potential categories for sorting stimuli, expressed more difficulties with emotion regulation, and became more anxious both before and after an emotionally-induced sorting task (Hayward, 2011). In contrast to this research, Grisham, Norberg, Williams, Certoma, and Kadib (2010) did not find that individuals with hoarding difficulties created more categories than clinical and non-clinical controls, although individuals with hoarding did report more anxiety during the task and took longer to complete the task.

With regard to memory difficulties, some neuropsychological studies indicate that compared to healthy controls, individuals with hoarding difficulties exhibit implicit memory deficits (Blom et al., 2011), and deficits in immediate and delayed recall of verbal information and delayed recall of visual information (Hartl et al., 2004). However, other research has found no evidence of impaired verbal memory (Tolin et al., 2011) or nonverbal memory (Mackin et al., 2011) in HD participants compared with other control groups. Hoarding problems may arise from fears about having a poor memory rather than actual memory deficits, and research has shown that compared to healthy controls, individuals with hoarding problems report lower confidence in their memories, more negative consequences of forgetting information, and a stronger need to keep objects in sight to assist memory (Hartl et al., 2004). Indeed, concerns about memory is one of the strongest predictors of hoarding behaviours, even after controlling for relevant covariates such as age, general distress, and OCD symptoms (Steketeet et al., 2003). The inconsistencies in the research may be related to the use of different neuropsychological assessments to measure memory domains, with some suggesting
that further research needs to account for confounding factors such as age and comorbid depression (for reviews, see Timpano, Smith, et al., 2014; Woody et al., 2014).

As noted previously, the association between indecisiveness and hoarding has been established (Frost & Gross, 1993; Frost, Tolin, et al., 2011; Samuels et al., 2007; Samuels et al., 2002). Research suggests that decision-making difficulties in hoarding are linked with a fear of making mistakes (Frost & Gross, 1993; Frost & Hartl, 1996; Frost, Tolin, et al., 2011; Samuels et al., 2007) and may also be due to executive functioning deficits (Steketee & Frost, 2003). Despite the support from self-report and imaging research with regard to decision-making difficulties in hoarding, findings from neuropsychological research on decision-making deficits in hoarding have shown mixed findings. For example, while one study found that OCD individuals with hoarding difficulties exhibited impaired decision-making abilities on a laboratory-based assessment (i.e., the Iowa Gambling Task; Bechara, Damasio, Damasio, & Anderson, 1994) compared to non-hoarding OCD individuals and controls (Lawrence et al., 2006), other studies utilising the same measure have found no such deficits (Blom et al., 2011; Grisham et al., 2007; Tolin et al., 2011). Such discrepancies may be due to the use of OCD hoarding samples versus “pure” hoarding samples and the use of different covariates (for a detailed review of the empirical research on decision-making and hoarding, see Timpano, Smith, et al., 2014).

In summary, despite some inconsistencies in the literature, there is empirical support for the role of information processing difficulties in hoarding, in the areas of attention, impulsivity, categorisation, organisation, memory, and decision-making. Furthermore, neuroimaging and neuropsychological studies overall suggest that individuals with hoarding difficulties exhibit dysfunction in the neural systems that mediate decision-making, attention, impulse control, and emotion regulation (e.g., Mataix-Cols et al., 2000; S. Saxena et al., 2004; Tolin, Kiehl, Worhunsky, Book, & Maltby, 2009; Tolin, Stevens, et al., 2012), providing support for the role of information processing deficits in the cognitive-behavioural model of HD. For example, research suggests that HD individuals exhibit abnormal functioning in the anterior cingulate cortex (ACC) and associated frontal and medial regions (An et al., 2009; S. Saxena et al., 2004; Tolin et al., 2009). Indeed, Tolin, Stevens, et al. (2012) found evidence for a biphasic abnormality in the ACC and insula function in HD individuals, which is indicative of difficulty with identifying the emotional significance of a stimulus,
generating an appropriate emotional response, or regulating affective state during decision-making. For detailed reviews on the information processing deficits in HD, and discussion of neuropsychological and neuroimaging studies, see Slyne and Tolin (2014), Timpano, Smith, et al. (2014), Woody et al. (2014) and Grisham and Baldwin (2015).

Beliefs about, and attachment to, possessions.

Maladaptive beliefs associated with hoarding include exaggerations about particular features of possessions such as their aesthetic, instrumental, or sentimental value (Frost & Steketee, 2008; Steketee & Frost, 2014b), as well as general beliefs about emotional attachment to possessions, memory-related concerns, control over possessions, and responsibility for possessions (Steketee et al., 2003). Emotional attachment to possessions involves beliefs about the emotional comfort of possessions, value of possessions, and feelings of loss. Memory-related concerns involve using possessions as memory aids, while beliefs about control refers to needing to control how objects are used and restricting others from touching, borrowing, or moving possessions. Responsibility for possessions reflects the perceived sense of responsibility for the correct use and well-being of the object and concerns about waste (Steketee et al., 2003). Individuals with hoarding problems also tend to hold unhelpful perfectionistic beliefs which can interfere with decision-making and lead to procrastination/difficulties discarding due to fears about making a mistake (Frost & Gross, 1993; Frost & Hartl, 1996; Timpano, Exner, et al., 2011).

Research confirms that individuals who hoard form strong emotional attachments to their possessions (e.g., Frost & Gross, 1993; Frost et al., 1995; Hartl et al., 2005), scoring significantly higher on measures of emotional attachment to possessions than do clinical or community controls (Grisham, Steketee, & Frost, 2008; Steketee et al., 2003). Individuals with hoarding difficulties save more possessions for sentimental reasons than do non-hoarding individuals, and see possessions as an extension of themselves, whereby parting with an object is like losing a piece of themselves or their past, or feels like the death of a close friend (Frost et al., 1995; Steketee et al., 2003). This is supported by a qualitative investigation which revealed that emotional connection to the past (events, places, people) was a key motivation for accumulating, saving, and being reluctant to discard possessions (Cherrier & Ponnor,
Emotional attachment can also be seen in the tendency for individuals who hoard to give their possessions human-like qualities (i.e., anthropomorphism) (Frost et al., 1995; Frost et al., 2012). Indeed, qualitative research reveals that strong emotional attachments to possessions may manifest in a tendency to anthropomorphize possessions, or to feel a sense of fusion with them (Kellett, Greenhalgh, Beail, & Ridgway, 2010). Empirical research demonstrates that anthropomorphising is associated with greater saving behaviours, the acquisition of free items, and beliefs about emotional attachment and responsibility, even after controlling for symptoms of depression and anxiety (Timpano & Shaw, 2013). Furthermore, individuals with a high tendency toward anthropomorphising and high hoarding beliefs demonstrated higher levels of acquisition and emotional attachment to a novel object, suggesting that anthropomorphism is a mechanism involved in the strong emotional attachment to possessions (Timpano & Shaw, 2013).

Individuals with HD also rely on possessions for a source of emotional comfort and security. That is, possessions become associated with ‘safety signals’, and the thought of discarding a possession threatens this feeling of safety, leading to feelings of distress or anxiety (Frost & Hartl, 1996; Steketee & Frost, 2003). Indeed, hoarding participants report a significantly higher degree to which possessions provide them with a sense of protection, comfort, and security compared with non-clinical controls (Hartl et al., 2005), and traumatic life events may play a role in increasing attachment to objects (Przeworski et al., 2014).

While research has found that OCD individuals with hoarding do not have more insecure attachment to people or more secure attachment to objects than non-hoarding OCD participants, they do endorse higher levels of emotional over-involvement with inanimate objects, more fear of losing their inanimate objects, greater levels of compulsive care-seeking from objects, and less ability to use their objects in times of need (Nedelisky & Steele, 2009). One experimental study examining the formation of attachment to possessions revealed that only beliefs about the emotional value of possessions and acquisition behaviours were found to be unique predictors of initial attachment, which may suggest emotional factors are particularly relevant in attachment formation (Grisham et al., 2009). Finally, the difficulties and greater distress experienced by individuals with hoarding problems when categorising personal versus
non-personal items may also be related to strong emotional attachment to possessions (Grisham et al., 2010; Wincze et al., 2007).

Overall, the research literature suggests that maladaptive beliefs about possessions play an important role in HD. A recent critical review suggests that strong emotional attachments to possessions are an important construct in HD, given the large effect sizes seen for hoarding samples compared to clinical and non-clinical samples, and a few studies which have shown that hoarding interventions can reduce levels of emotional attachment (see Kellett & Holden, 2014).

**Emotions and their role in reinforcing hoarding behaviour**

According to the cognitive-behavioural model of hoarding, both positive and negative emotions play a key role in hoarding, and are implicated in etiological and maintenance processes (Frost & Hartl, 1996; Frost & Steketee, 1998, 2008; Steketee & Frost, 2003, 2014b). Indeed, hoarding is highly comorbid with MDD, and other negative emotions are also associated with hoarding (Frost, Steketee, et al., 2011). For example, anxiety or distress is typically experienced at the notion of discarding a valued possession; sadness or grief is experienced over the loss of an important possession; frustration is felt about being unable to make a decision; distress is felt about making a mistake with a decision; or guilt is experienced over violating one’s perceived responsibility (e.g., being wasteful). In order to escape from the distress and negative emotions associated with discarding, individuals with hoarding problems avoid discarding, which negatively reinforces saving and clutter. However, avoiding discarding prevents corrective feedback to distorted beliefs, maintains saving behaviours and levels of clutter in the home, and therefore perpetuates the negative emotions associated with the problem behaviour. Likewise, the act of saving is a way of circumventing decision-making and therefore, a way of avoiding the negative emotions associated with making decisions. Positive emotions such as pleasure, joy, excitement, pride, and relief are triggered by beliefs about the sentimental, instrumental, and aesthetic values of objects, by the acquisition of new possessions, and when finding prized possessions while sorting through clutter. As such, these positive emotions reinforce acquiring and saving behaviours (Frost & Hartl, 1996; Frost & Steketee, 1998, 2008; Steketee & Frost, 2003, 2014b).
Support for the role of emotions in hoarding behaviour can be drawn from the compulsive buying literature. Motivational factors underlying compulsive buying include changing one’s mood state or arousal level, with research showing that compulsive shoppers experience negative mood states more often before shopping and positive mood states more often during shopping, compared to other consumers (Faber & Christenson, 1996). As such, negative mood states may lead to excessive buying due to the belief that buying can neutralise depression or negative feelings (Kyrios, Frost, & Steketee, 2004). While acquisition may provide short-term relief from negative mood states, or short-term feelings of euphoria/gratification, it leads to the reliance on shopping as a coping strategy, and ultimately creates problems that lead back to negative mood states (Faber & O'Guinn, 2008; Kyrios, 2014). Indeed, one study found that a group of individuals with clinically significant hoarding and high rates of comorbid depression was characterised by high levels of impulsivity, acquiring behaviours, poor emotion regulation strategies and poor self-control, lending support to the idea that compulsive acquisition may reflect a maladaptive way of regulating mood (Hall, Tolin, Frost, & Steketee, 2013). A review of the empirical literature supporting the role of emotional processing and regulation difficulties in HD is covered in detail in Chapter 4.

**Treatment of Hoarding Disorder**

Hoarding symptoms have historically been considered difficult to treat, with factors such as limited insight, indecisiveness, and ambivalence about de-cluttering considered to interfere with treatment (Brakoulias & Milicevic, 2015). Indeed, professionals tend to describe hoarding clients as having less insight and understanding, engaging in a higher level of therapy-interfering behaviours, and lowered adherence to treatment compared to non-hoarding clients (Tolin, Frost, & Steketee, 2012). Furthermore, poor insight and difficulty answering questions appropriately were found to be the strongest predictors of rejecting attitudes toward the hoarding client (Tolin, Frost, et al., 2012). Initial studies on treatment outcomes utilising interventions that are effective for OCD demonstrated little benefit for treating hoarding (Steketee & Frost, 2003). For example, hoarding symptoms have typically been associated with poor response to pharmacological treatments for OCD (e.g., Black et al., 1998; Mataix-Cols, Rauch, Manzo, Jenike, & Baer, 1999; Winsberg et al., 1999), cognitive and/or
behavioural interventions for OCD (e.g., Abramowitz, Foa, & Franklin, 2003; Black et al., 1998; Mataix-Cols, Marks, Greist, Kobak, & Baer, 2002; Rufer, Fricke, Moritz, Kloss, & Hand, 2006), and combined treatments (e.g., Black et al., 1998; Winsberg et al., 1999). A recent meta-analysis reported that individuals with OCD and hoarding symptoms were significantly less likely to respond to traditional OCD treatments (across all modalities) than those without hoarding (Bloch et al., 2014).

The limited success of treating hoarding with the “gold standard” behavioural treatment for OCD (i.e., exposure and response prevention) led researchers to develop alternative methods for treating hoarding. Accordingly, a specialised cognitive-behavioural therapy (CBT) protocol for hoarding was developed based on the cognitive-behavioural model of hoarding, first formalised in a therapist guide and client workbook (Steketee & Frost, 2007a, 2007b), later elaborated on in a self-help book (Tolin, Frost, & Steketee, 2007a), and more recently, second editions of the therapist guide and client workbook (Steketee & Frost, 2014b, 2014c) and a group treatment therapist guide (Muroff, Underwood, & Steketee, 2014) have been released to reflect DSM-5 criteria for HD.

The current manualised CBT treatment protocol for HD (Steketee & Frost, 2007a, 2014b) is designed to be delivered in 26 weekly sessions spread over a half year period, with one monthly visit to the individual’s home or acquisition site. Briefly, the treatment protocol consists of: 1) assessment and personalised case formulation including psychoeducation about hoarding; 2) motivational enhancement, goal setting and treatment planning; 3) cognitive techniques for hoarding-related beliefs; 4) skills training and practice in sorting, organisation, problem-solving, and decision-making; 5) exposure methods to non-acquisition and discarding; and 6) relapse prevention. Treatment is accompanied by the client workbook which reinforces what individuals learn during sessions.

Treatments based on the cognitive-behavioural model and treatment manual for hoarding have been evaluated in individual case studies (Cermele, Melendez-Pallitto, & Pandina, 2001; Hartl & Frost, 1999), open trials of individual treatment (Tolin, Frost, & Steketee, 2007b) and group format treatments (Gilliam et al., 2011; Muroff et al., 2009; Steketee, Frost, Wincze, Greene, & Douglass, 2000), along with a waitlist controlled trial of individual treatment (Steketee, Frost, Tolin, Rasmussen, & Brown, 2010) and a follow-up study 3 – 12 months after treatment (Muroff, Steketee, Frost, & Tolin, 2014).
Overall, this research suggests that CBT specialised for hoarding is successful in reducing hoarding symptoms, with effect sizes ranging from moderate-to-large (for reviews, see Muroff et al., 2011; Steketee, 2014). A recent meta-analytic review of 12 CBT studies conducted with HD samples established that the severity of hoarding symptoms significantly decreased across studies, with a large effect size (Tolin et al., 2015). The strongest effects were observed for difficulty discarding, followed by clutter and acquiring, and predictors of better response to CBT treatment included being female, of younger age, and having a greater number of sessions and home visits. However, while pre- to post-treatment change was significant, the majority of participants had post-treatment scores that were in or closer to the clinical range than the normal range, suggesting that although CBT is a promising treatment for HD there remains substantial room for improvement (Tolin et al., 2015). Another recent systematic review found that CBT interventions designed to treat hoarding symptoms associated with OCD or HD demonstrate improvements in hoarding symptoms, although more research is required (M. Williams & Viscusi, 2016).

One recently published treatment outcome demonstrated the effectiveness of a short-term (i.e., 12 session) format of group CBT treatment for individuals with clinically significant hoarding in a community-based setting (Moulding, Nedeljkovic, Kyrios, Osborne, & Mogan, 2016). Over a three-year period, 12 group programmes were completed by a total of 77 participants. Results demonstrated that for those participants who completed post-treatment assessment (n = 41), hoarding symptoms had significantly decreased, with a large effect size, while hoarding beliefs (i.e., emotional attachment and responsibility) and depressive symptoms had significantly decreased, with a moderate effect size. Furthermore, a third of all participants who completed post-treatment assessment experienced clinically significant change – a substantial outcome considering the short duration of the programme compared to the long-standing nature of the disorder (Moulding, Nedeljkovic, et al., 2016).

Research has also investigated the effectiveness of short-term (i.e., 12 session) individualised CBT for individuals with mild intellectual disabilities and hoarding difficulties, with results demonstrating high treatment acceptability (i.e., zero dropout rate), significant reductions in hoarding symptoms as measured by self-report and an environmental assessment of clutter, and maintained gains at six-month follow-up (Kellett, Matuozzo, & Kotecha, 2015).
There are also alternative formats for delivering cognitive and behavioural
treatments for hoarding such as support groups, online interventions, and peer support
groups, which have also shown promising results (for a review, see Muroff, 2014).
Other treatments for hoarding include family-based interventions and community
interventions; for a discussion, see Tompkins and Hartl (2014) and Bratiotis and Woody
(2014), respectively.

Finally, there are pharmacological approaches to treating HD, with one review
reporting that serotonin reuptake inhibitor (SRI) medications are as effective for HD as
they are for OCD, that symptom improvement from pharmacotherapy is similar to
improvement from CBT, and that the combination of CBT for hoarding and
pharmacotherapy is likely to be most effective (see S. Saxena, 2014). However, there
have only been two treatment outcomes studies on the effectiveness of SRI medication
in individuals with HD. A more recent meta-analytic review found that 37-76% of
participants with pathological hoarding across seven studies responded to
pharmacotherapy, although further research is required in the context of limitations such
as small sample size, the use of more than one medication or medications from different
classes, and the inclusion of individuals with a diagnosis of OCD and measures
assessing OCD symptoms more than HD features (Brakoulias, Eslick, & Starcevic,
2015).

Critique of the Cognitive-Behavioural Model and Treatment for HD

While there has been great progress in understanding the phenomenology of
hoarding over the past 20 years, and strong support for the cognitive-behavioural model
and treatment of hoarding, it remains a difficult condition to treat and ongoing research
is required. Given the serious nature of HD, there is room for improvement with regard
to treatment efficacy, client acceptability and adherence to interventions, treatment
length and costs, service delivery methods, and stability of positive outcomes (Muroff et
al., 2011; Steketee, 2014). Further research is also needed with more diverse and larger
samples, and should explore the impact of comorbid conditions on CBT outcomes to
determine whether modifications or additional interventions are required (Steketee,
2014). Furthermore, it will be important to examine which specific components of CBT
contribute to the most improvement and whether the components reduce the specific
symptoms they are designed to target (Muroff et al., 2011; Steketee, 2014). Future
research may reveal factors (other than cognitive or behavioural) that are relevant for hoarding, and ongoing research on the underlying etiological and maintaining factors and associated causal pathways is likely to contribute to the cognitive-behavioural model of hoarding and inform treatment for HD (Kyrios, 2014).

The cognitive-behavioural model of HD parallels existing cognitive-behavioural models of anxiety disorders and obsessive-compulsive spectrum disorders, which highlight avoidance behaviour as a maintaining factor of symptoms (Barlow, 2002). However, Campbell-Sills and Barlow (2007) argue that one important shortcoming of cognitive-behavioural models of anxiety and mood disorders in general, is the tendency to reduce emotion to its associated thoughts and behaviours. It is suggested that this emphasis on cognition and behaviour may have obscured the recognition of fundamental disturbances in the way individuals suffering these disorders experience and respond to their emotions in general. Therefore, individual differences in emotion regulation may be related to vulnerability and resilience to anxiety and mood disorders, and many clinical features of anxiety and mood disorders (e.g., worry and behavioural avoidance) can be understood as maladaptive attempts to regulate unwanted emotions (Campbell-Sills & Barlow, 2007).

Indeed, while the cognitive-behavioural model of HD and empirical research suggests that the symptoms of the disorder are maintained by distorted beliefs about possessions (Coles, Frost, Heimberg, & Steketee, 2003; Frost & Hartl, 1996; Frost, Steketee, & Grisham, 2004; Steketee & Frost, 2003; Steketee et al., 2003), cognitions do not fully account for the presence of symptoms. Likewise, although the cognitive-behavioural model posits that emotional processes play an important role in hoarding and some of the research reviewed above suggests that hoarding behaviours are likely driven by difficult emotions, further research is required into the role of emotion regulation and the mechanisms by which some components of the CBT model contribute to hoarding behaviours (Grisham & Baldwin, 2015). For example, it is unclear why experiencing negative emotions would lead directly to avoidance behaviour in individuals with hoarding problems, when presumably non-hoarding individuals may hold similar beliefs and emotional attachments to their possessions and experience similar emotional experiences when discarding their possessions (Phung et al., 2015). Perhaps the difference between the two is related to the perceived aversiveness of the emotional experience itself, which may suggest that individuals with HD have
underlying difficulties with understanding and regulating their emotions. As such, individuals with HD would likely go to great lengths to alleviate negative emotional states, leading to the avoidance of emotions altogether, which would serve to reinforce hoarding behaviours as possessions may be depended upon for alleviating negative emotions (Phung et al., 2015).

Over the past decade and a half there has been a surge of interest and greater attention paid to the role of emotional processes and emotion regulation across a range of disorders (Gross, 2013). However, research on emotional variables with respect to hoarding was very limited at the commencement of this research project. Further research on understanding and treating HD is vital, given the serious consequences for the individual and society, and the role of emotion regulation is one important avenue for ongoing research. While current CBT treatments for the disorder include exposure work for tolerating uncomfortable feelings during sorting tasks, there may be a need for more basic emotion regulation skills training prior to exposure exercises and also for managing non-hoarding emotional experiences. The current research aims to contribute to and extend upon the emerging body of research on emotion regulation in hoarding behaviour, in the context of the existing CBT model of HD, which is likely to have implications for the model and treatment interventions. The following chapter turns to a discussion of emotion regulation theory and empirical research.
Chapter 3: Emotion Regulation Theory and Research

Over the past few decades there has been a surge of interest in, and advancement of, the theory and empirical research on emotion regulation (ER). Indeed, with thousands of new publications each year, ER appears to be one of the fastest growing areas within psychology (Koole, 2009; Tamir, 2011). This is perhaps unsurprising given that the majority of adults presenting to clinical settings are seeking help for some aspect of their emotional experiences (Sloan & Kring, 2010). While clinical presentations and symptoms may vary, the phenomenology of many psychiatric disorders appears to be largely characterised by ER difficulties – that is, impairments in the way individuals experience, evaluate, and behave in response to their emotions (Sloan & Kring, 2010). Indeed, researchers estimate that between 40% to 75% of psychiatric disorders are characterised by problems with emotion and ER (see Barlow, 2000; Berenbaum, Raghavan, Le, Vernon, & Gomez, 2003; Gross & Muñoz, 1995; Jazaieri, Urry, & Gross, 2013; Kring & Werner, 2004; Werner & Gross, 2010).

For some disorders, such as the mood and anxiety disorders, emotion dysregulation is so pronounced that these disorders are defined largely on the basis of disturbed emotions (Mineka & Sutton, 1992). However, emotion dysregulation is also evident across many other disorders such as borderline personality disorder (BPD), post-traumatic stress disorder (PTSD), substance use disorders, ICDs, eating disorders, and somatic symptom disorders (e.g., Badour & Feldner, 2013; for a review, see Berking & Wupperman, 2012; Brockmeyer et al., 2014; A. D. Williams, Grisham, Erskine, & Cassedy, 2012), with some suggesting that ER difficulties are a transdiagnostic factor underlying many forms of psychopathology (Barlow et al., 2004; Werner & Gross, 2010). Although ER is not a disorder-specific concept and the ER field is faced with challenges such as the heterogeneity of emotion-related processes, different definitions of emotion and ER, heterogeneity within psychiatric disorders, and uncertainty around causal mechanisms, the role of emotion and ER in different forms of psychopathology is an important avenue for ongoing research (Gross & Jazaieri, 2014).

The literature in the field of ER is too large to cover exhaustively, particularly given that there are diverse theoretical perspectives and different approaches to empirical research on ER from various areas of psychology, such as neurobiological (e.g., Gyurak & Ekin, 2014; Hartley & Phelps, 2010), developmental (e.g., Eisenberg,
2000; Thompson, 2014), cognitive (e.g., Garnefski, Kraaij, & Spinhoven, 2001; E. M. Miller, Rodriguez, Kim, & McClure, 2014), social (e.g., Coan & Maresh, 2014; Snyder, Heller, Lumian, & McRae, 2013), clinical (e.g., Linehan, 1993; Mennin & Fresco, 2014; Tull, Barrett, McMillan, & Roemer, 2007; T. L. Webb, Miles, & Sheeran, 2012), personality (e.g., Gross & John, 2003; John & Eng, 2014), organisational (e.g., Côrte, 2005; Grandey, Dieendorff, & Rupp, 2013), and health (e.g., Appleton & Kubzansky, 2014; DeSteno, Gross, & Kubzansky, 2013). Furthermore, the literature has some ambiguity, given a wide variety of ways in which emotion and ER are defined, conceptualised, and measured, which precludes a comprehensive account of the field. Therefore, the scope of this chapter is focused on several specific areas of relevance and of the greatest general influence on the field.

Firstly, the main features of emotion that are common across different approaches will be outlined. Next, an overview of two well-recognised conceptualisations of ER in the psychological literature will be provided (i.e., Gratz & Roemer, 2004; Gross, 1998b), along with some of the empirical support for each in relation to psychopathology. Briefly, the overlap and contrast between these two conceptualisations will be outlined. Subsequently, several other ER constructs thought to be implicated in the development and maintenance of psychopathology will be described (i.e., experiential avoidance, alexithymia, and impulsivity), including their overlap with and distinctness from other related ER constructs, and some of the empirical support for their role in various forms of psychopathology will be noted.

**Defining Emotion**

There are numerous approaches to understanding and defining emotion, such as physiological approaches (e.g., James, 1884; Lange, 1885), basic emotion approaches (e.g., Ekman, 1972), appraisal approaches (Lazarus, 1991; Scherer, Schorr, & Johnstone, 2001), social construction approaches (e.g., Harre, 1986) and psychological construction approaches (e.g., Barrett, 2009; Russell, 2003). Although there are key differences in these conceptualisations of emotion, Gross (2015a) suggests that there are three common features evident across these approaches. According to Gross, the first core feature concerns the multifaceted nature of emotion. That is, emotions are whole-body responses that include loosely coupled changes in experiential, behavioural, and physiological domains (Mauss, Levenson, McCarter, Wilhelm, & Gross, 2005). Some
researchers consider such changes to reflect the concept known as ‘emotional reactivity’ (Gross & Jazaieri, 2014). While the subjective experience of emotion is fundamental, emotions do more than make us feel - they also motivate us to act (Frijda, 1986). The impulse to act in some ways, and to not act in other ways, include the impetus to engage in instrumental actions that are specific to the situation, along with performing other actions such as changes in facial behaviour and body posture. Such changes in experience and behaviour are accompanied by autonomic and neuroendocrine responses that anticipate and follow emotion-related behaviours (Lang & Bradley, 2010). As highlighted by functionalist perspectives on emotion, the multifaceted nature of emotion often (but not always) can be beneficial for helping to achieve the goals that initially prompted the emotions (Levenson, 1999).

The second feature pertains to when emotions occur, as emotions unfold over time (Cunningham & Zelazo, 2007). According to appraisal theory, emotions arise when an individual attends to and appraises a situation as relevant to his or her currently active goals (Lazarus, 1991; Scherer et al., 2001). The goals underlying this appraisal may be enduring or transient, conscious or unconscious, commonly shared or idiosyncratic. Regardless of the nature of the goal, it is the meaning of the situation in light of the goal that gives rise to emotion. Over time the emotion changes as either the situation itself changes or the meaning the situation holds for the individual changes (Gross, 2014). The modal model of emotion (Gross, 1998b) is one way of depicting the various steps in the emotion-generative process. The sequence begins with 1) a psychologically relevant trigger or situation, either internal or external, which is then 2) attended to in various ways, and 3) appraised for its relevance to one’s active goals. This appraisal process then instigates 4) a multifaceted emotional response involving changes in experiential, behaviour, and neurobiological systems (Gross, 1998b).

Finally, emotions can be helpful or harmful, depending on the context (Gross, 2015a). The modal model of emotion involves a recursive aspect which depicts how emotions can change the environment, and influence ensuing emotions (Gross & Thompson, 2007). For example, if during a heated argument one person begins to cry, this emotional response changes the interpersonal situation, giving rise to a new response from the other person, perhaps compassion. This compassionate response further alters the interpersonal situation, eliciting other emotions in both people (Gross, 2014). Emotions can be harmful when their intensity, duration, frequency, or type is
inappropriate for a given situation, or when they erroneously bias cognition and behavior (Gross & Jazaieri, 2014). It is occurrences of unhelpful emotions (e.g., anger that leads to violence, anxiety that debilitates one’s capacity to work), that highlight the importance of ER (Gross, 2015a).

Before discussing the concept of ER, it is worth noting that there is some debate in the literature on whether emotions and ER are separate processes. For example, some argue that emotions are self-regulatory in their nature and the two processes are so intertwined that there is no clear distinction between them (e.g., Kappas, 2011; Thompson, 2011), while others maintain that emotions and ER are two distinct processes, whereby regulation can occur either before or after emotions occur (e.g., Gross, 1998b; Mennin & Fresco, 2009; see Gross, Sheppes, & Urry, 2011 for a discussion of when and in what ways the distinction between emotion generation and ER is useful). For the purposes of this research project, and drawing on the larger consensus in the literature, the experience of emotions and the regulation of emotions are viewed as separate processes.

Defining Emotion Regulation

There is a large range of definitions, conceptualisations, and classification systems of ER in the psychological literature (e.g., Bonanno & Burton, 2013; Campbell-Sills & Barlow, 2007; Garnefski & Kraaij, 2007; Garnefski et al., 2001; Gratz & Roemer, 2004; Gross, 1998b, 2015a, 2015b; Gross & Thompson, 2007; Koole, 2009; Mennin & Fresco, 2009, 2014, 2015; Tamir, Bigman, Rhodes, Salerno, & Schreier, 2015; Thompson, 1991, 1994, 2014; T. L. Webb, Gallo, Miles, Gollwitzer, & Sheeran, 2012). The scope of this chapter is limited to an overview of two contemporary conceptualisations of ER, the process model of ER (Gross, 1998b) and the multidimensional conceptualisation of ER and dysregulation (Gratz & Roemer, 2004).

The process model of emotion regulation.

According to Gross (1998b, 2015a), ER, coping, and mood regulation are specific forms of a higher-order construct of affect regulation. While there is overlap between these regulatory processes, coping is distinguished from ER by its main focus on alleviating negative emotion and stress responses over the long term (e.g., coping with bereavement over months), while moods tend to have less well-defined behaviour
response tendencies than emotions and mood regulation has a predominant emphasis on altering subjective feeling states (Gross, 1998b, 2015a). In contrast, ER refers to the processes by which we attempt to influence what emotions we have, when we have them, and how we experience and/or express them (Gross, 1998b).

The defining feature of ER is the activation of a goal to influence the emotion-generative process (Gross, Shippes, & Urry, 2011). The goal may be intrinsic (i.e., regulating one’s own emotions) or extrinsic (i.e., regulating another person’s emotions), although in some situations the two can co-occur. Individuals can regulate either positive or negative emotions. While everyday ER tends to involve efforts to downregulate negative emotions and upregulate positive emotions, individuals also are motivated to upregulate negative emotions and downregulate positive emotions in order to achieve instrumental, non-emotional goals (Gross, 2014). Individuals can modify the intensity of emotions by increasing or decreasing emotional experience or behaviour, they can change the duration of emotion by decreasing or drawing out how long an emotion lasts, and they can also alter the quality of an emotional response (Gross, 2015a). In order to achieve these goals, individuals utilise various regulation strategies, which are thought to lie along a continuum from explicit, conscious, effortful, and controlled regulation, to implicit, unconscious, effortless, and automatic regulation (Gross, 2014; Gyurak & Ekin, 2014).

Given the vast number of strategies that individuals use to regulate their emotions, researchers in the field have attempted to develop ways of organising these strategies and assessing whether different strategies are associated with different outcomes (Gross, 2015a). The process model of ER (Gross, 1998b) is perhaps the most widely used framework for organising ER strategies (T. L. Webb, Miles, et al., 2012) and builds upon the modal model of emotion, proposing that each of stage of the emotion-generative process can be targeted for regulation. Specifically, the process model identifies five families of ER processes along the timeline of the emotion process: situation selection, situation modification, attentional deployment, cognitive change, and response modulation (Gross, 1998b). These families are distinguished according to the point in the emotion-generative process at which they have their primary impact, although regulation strategies can be and often are used in combination (Gross, 1998b, 2015a). The process model of ER proposes that intervening at different points in the emotion-generative process should lead to different patterns of emotion
experience, expression, and physiology, and that different strategies will modify the emotion trajectory in different ways (Gross, 1998b, 2015a). The following section provides an overview of the five families of ER strategies depicted in the process model of ER.

Situation selection refers to influencing whether one will end up in a situation that one expects will generate an emotion (either desired or undesired). That is, choosing to approach or avoid particular places, people, or activities either increases or decreases the likelihood of experiencing an emotion (Gross, 1998b, 2015a). The use of situation selection as an ER strategy can easily become problematic when used perversively and inflexibly, as seen in the anxiety disorders (e.g., social anxiety disorder, panic disorder) where the individual repeatedly avoids situations which reduces their anxiety in the short-term, but over the long-term is believed to maintain their fear and to impact negatively on their quality of life (Campbell-Sills & Barlow, 2007; Werner & Gross, 2010).

Upon selecting a situation to enter into, the external features of the environment can be modified in an effort to alter its emotional impact. It can sometimes be difficult to distinguish between situation selection and situation modification, given that modifying a situation can create a ‘new’ situation (Gross, 1998b, 2015a). Situation modification strategies can be maladaptive when they impede full exposure to the feared situation (Werner & Gross, 2010). For example, individuals with social anxiety disorder often prevent themselves from fully experiencing the feared situation because they engage in safety behaviours designed to modify the situation (e.g., drinking prior to or during social interactions). In such instances, when the individual’s feared expectations do not eventuate, this non-occurrence is attributed to the safety behaviour rather than recognising that the situation itself was not dangerous (Clark, 2001; Werner & Gross, 2010). Situation modification can also be problematic when it dominates cognitive resources, draws more attention to the individual, or increases self-monitoring and negative self-focused attention (Clark, 2001; Werner & Gross, 2010).

Attentional deployment involves directing attention within a situation in such a way as to influence emotions. For example, one of the most common forms of attentional deployment is distraction, which refers to focusing attention away from the situation and onto other aspects of the environment, or changing internal focus (Gross & Thompson, 2007). Research has demonstrated that the use of distraction is associated
with diminished emotional responses to negative emotion-eliciting material (e.g., Bennett, Phelps, Brain, Hood, & Gray, 2007), reductions in depressed mood (e.g., Nolen-Hoeksema & Morrow, 1993), and lowered amygdala activity (e.g., Kanske, Heissler, Schönfelder, Bongers, & Wessa, 2011). Rumination is another form of attentional deployment which refers to a passive fixation on the nature, causes, and consequences of one’s emotional distress (Gross, 1998b; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). This form of attentional deployment is problematic as it is passive in nature, and not actively involved in trying to change or address the problem (Nolen-Hoeksema et al., 2008). Research demonstrates that rumination is associated with anxiety, depression, eating, and substance use psychopathology (see Aldao, Nolen-Hoeksema, & Schweizer, 2010), and rumination and worry are also associated with increased cardiovascular, immune, endocrine, and sympathetic nervous systems activity (Brosschot, Gerin, & Thayer, 2006).

Cognitive change refers to choosing which of several possible emotional meanings will be attributed to a situation, and it is this emotional meaning that gives rise to the experiential, behavioural, and physiological responses that define emotion (Gross, 1998b, 2015a). Cognitive change can be applied to internal or external situations, and represents efforts to change the meaning of the situation in an attempt to alter its emotional impact. It can involve changing how one thinks about the situation (i.e., reappraisal), or changing how one thinks about their capacity to manage the situation (Gross, 1998b, 2015a). According to Gross (2015a), reappraisal is a broad term reflected in the entire family of cognitive change strategies, which is generally used to decrease negative emotion, although it can also be used to increase or decrease negative or positive emotions (Ochsner & Gross, 2005). While cognitive reappraisal is considered an adaptive ER strategy and is associated with a range of positive outcomes (to be discussed in detail in the following sections), reappraisal can be problematic when it takes the form of unhelpful beliefs about the acceptability of emotions. That is, the initial emotional responses to life experiences are deemed to be not so problematic, but rather it is the reappraisals that individuals have towards their initial emotional reactions that can exacerbate and maintain psychological suffering (L. S. Greenberg & Safran, 1990; S. C. Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Mennin, Holaway, Fresco, Moore, & Heimberg, 2007). Beliefs about the acceptability of emotions leads to having emotions about emotions, and when these emotions about emotions are negative
(e.g., “I hate myself for feeling depressed”), individuals may make frantic attempts to diminish this secondary emotional experience (Werner & Gross, 2010). How an individual chooses to appraise the situation, the emotions they are experiencing, and their capacity to manage them, will impact on their emotional response (Gross, 1998b, 2015a).

Response modulation relates to efforts to directly change one or more of the experiential, behavioural, or physiological response tendencies after they have been activated. There are various forms of response modulation, for example alcohol, drugs, and food may be used to modify one’s emotional state, or relaxation techniques may be used to reduce one’s physiological symptoms of anxiety (Gross, 1998b, 2015a). Perhaps the most well-studied form of response modulation is expressive suppression, which refers to efforts to inhibit ongoing negative or positive emotion-expressive behaviour (Gross & John, 2003; Gross & Levenson, 1993) and is associated with a range of negative outcomes that are inconsistent with the aims of effective ER (to be discussed in detail in the following sections). According to Werner and Gross (2010), experiential avoidance is another form of response modulation, which involves an unwillingness to experience internal events such as emotions, which may have the paradoxical effect of maintaining those emotions (S. C. Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Further detail on the construct of experiential avoidance will be discussed later in the chapter.

The first four ER families represent antecedent-focused ER processes, as they occur before the generation of a full emotional response. In contrast, response-focused ER processes occur after the emotional response is generated (Gross, 1998a). While individuals move through the process in any given emotion-generative cycle, the emotional response can have many points of feedback, given the dynamic nature of emotion and ER. In everyday life it is common for individuals to engage in behaviours that represent various combinations of different strategies, as opposed to the use of a single strategy (Gross, 2014). Indeed, experimental research demonstrates that in response to an emotion-eliciting film clip, individuals spontaneously implement multiple strategies to regulate their emotions (Aldao & Nolen-Hoeksema, 2013). It is also important to note that ER strategies can be adaptive or maladaptive depending on the context, the emotion, and the individual (Aldao & Nolen-Hoeksema, 2012), and that there is significant variation both between and within families of ER processes (T. L.
Webb, Miles, et al., 2012). Indeed, Gross (2014) cautions against classifying ER strategies as better or worse than others. For example, the benefits of reappraisal are influenced by context, in that when emotional intensity is already high, reappraisal does not exert the same experiential or physiological benefits seen in other contexts (Sheppes, Catran, & Meiran, 2009).

According to Gross (2015a), the process model does not explain what leads an individual to use one ER strategy rather than another of the various ER strategies described by the model. To address this, Gross has proposed the extended process model of ER (Gross, 2015a) which considers ER to be one type of valuation and distinguishes three stages of ER (i.e., identification, selection, and implementation). A discussion of the extended process model is beyond the scope of the current thesis; please refer to Gross (2015a, 2015b) for more detail.

**How emotion regulatory processes may be implicated in psychopathology.**

Many forms of psychopathology are characterised by problems with emotional responding in the domains of emotional intensity, duration, frequency, and type (see Gross & Jazaieri, 2014 for an illustration of these emotional responding problems in various psychiatric disorders). However, it is important to differentiate between emotional problems and ER problems (Gross & Jazaieri, 2014). While some of the emotional problems seen in psychopathology may be explained by individual differences in emotional reactivity and environmental factors which can cause disturbances in the emotion-generative process, other emotional problems are the result of emotion dysregulation, due to either ER failure or emotion misregulation (Gross & Jazaieri, 2014).

According to Gross (2013), there are many pathways to ER failure (i.e., not engaging in regulation strategies when it would be helpful to do so), and emotion misregulation (i.e., using a form of ER that is poorly matched to the situation). As successful ER involves accurate tracking of emotional responses either implicitly and explicitly, simple tracking failures might lead to ER failure. However, even if emotions are accurately tracked, individuals may still fail to activate a goal, or make an error in the selection of the ER goal. Furthermore, even after an ER goal has been activated, there is a multitude of strategies that could be utilised, some of which will be more appropriate to the context than others. Context-specific factors such as the intensity of the emotion will influence strategy selection, while stable factors such as beliefs about
emotions will also influence ER. Even if an individual adopts a potentially appropriate strategy, successful ER is not inevitable. Successful regulation necessitates that the goal to regulate a particular emotion in a particular way is safeguarded from other competing goals, and is sustained and then flexibly altered if circumstances change (Gross, 2013). Indeed, there are several important factors for selecting an appropriate ER strategy to use in a given context (Gross & Jazaieri, 2014). Firstly, the overall effectiveness of the strategy is important, given that research suggests that strategies do differ in terms of their effectiveness (T. L. Webb, Miles, et al., 2012). Secondly, the availability of resources required to implement a strategy is important. Different forms of ER make different cognitive demands, and individuals are unlikely to employ strategies that exceed their available resources (Urry & Gross, 2010). Furthermore, the intensity of the emotion to be regulated will influence strategy selection as some strategies are more or less effective depending on the level of emotional intensity. Gross and Jazaieri (2014) maintain that healthy ER choice involves an accurate awareness of the key elements of the particular situation (e.g., the intensity of the emotion), an awareness of the differential effectiveness of various strategies, and a realistic assessment of the resources required to implement the strategy. As such, difficulties in any one or more of these steps, or with the ability to appropriately weigh these often competing factors, are likely implicated in various forms of psychopathology (Gross & Jazaieri, 2014).

In sum, in order to successfully change problematic emotions, individuals need to have an awareness of the emotion and the relevant context, knowledge of their short- and long-term goals, and to skilfully select and apply these ER strategies to move from their current state to their desired goal state (Gross & Jazaieri, 2014). Difficulties in each of these areas are implicated in psychopathology. For example, Gross and Jazaieri (2014) maintain that individuals with panic disorder appear to have problems with emotional awareness, given that the disorder is characterised by hypervigilance and a hyperawareness of physiological sensations (e.g., N. B. Schmidt, Lerew, & Trakowski, 1997). According to Gross and Jazaieri, Bipolar I disorder may be characterised by dysfunctional emotion regulatory goals, given that affected individuals appear to have an inability to adequately consider long-term consequences and down-regulate positive emotions during manic states. Emotion regulation choice appears to be problematic in agoraphobia which is characterised by the overuse of situation selection (i.e. avoiding feared situations). Similarly, ER choice appears to be problematic in the case of OCD,
which is characterised by the overuse of compulsions as a way of suppressing or avoiding the experience of emotions evoked by intrusive thoughts (Calkins, Berman, & Wilhelm, 2013; Stern, Nota, Heimberg, Holaway, & Coles, 2014). Finally, ER implementation may be problematic in ADHD given that inattention likely impacts on the affected individual’s ability to shield regulation goals from other competing goals (for more detail, see Gross & Jazaieri, 2014).

In particular, the implementation aspect of ER has been an important focus for research, given that various forms of psychopathology appear to involve problems with the implementation of ER strategies (Aldao & Dixon-Gordon, 2014; Aldao et al., 2010; Berking & Wupperman, 2012; Gross, 2015a; Hu et al., 2014). There is a wide range of ER strategies encapsulated by the process model of ER. For example, distraction, rumination, thought suppression, and worry represent attentional deployment strategies; cognitive reappraisal, distancing, and the use of humour are examples of cognitive change strategies; and expressive suppression, experiential avoidance, exercise, and substance use are examples of response modulation strategies (Gross, 1998b, 2014). However, the two most commonly researched ER strategies are cognitive reappraisal and expressive suppression, and the following section provides an overview of the empirical research pertaining to these two strategies.

**Empirical research on cognitive reappraisal and expressive suppression.**

As mentioned previously, cognitive reappraisal refers to reinterpreting an event in order to alter its emotional impact, and therefore represents an antecedent-focused strategy that has its impact early in the emotion-generative process before emotion response tendencies have been fully activated (Gross, 1998b; Gross & John, 2003). When used to down-regulate negative emotions, reappraisal should effectively reduce the experiential and behavioural elements of negative emotion (Gross & John, 2003). In contrast, expressive suppression refers to inhibiting emotion-expressive behaviour and is a response-focused strategy occurring late in the process after the emotional response has been triggered (Gross, 1998b; Gross & John, 2003). As such, expressive suppression should be successful in decreasing the behavioural expression of negative emotion, but not necessarily the subjective experience of emotion (Gross & John, 2003). Furthermore, expressive suppression is proposed to inhibit the expression of positive emotion, to be cognitively taxing as one tries to manage emotional responses as they
continually arise, and may create a sense of inauthenticity given the incongruence between one’s inner experience and outer expression (Gross & John, 2003).

Gross and John (2003) developed the Emotion Regulation Questionnaire (ERQ) to measure individual differences in the use of cognitive reappraisal and expressive suppression, and these constructs have become the focus on much research. As the correlation between the two constructs tends to be close to zero (e.g., Balzarotti, John, & Gross, 2010; Gross & John, 2003; Melka, Lancaster, Bryant, & Rodriguez, 2011; Moore, Zoellner, & Mollenholt, 2008), cognitive reappraisal and expressive suppression are considered to be two independent regulatory strategies that different individuals use to different degrees (Gross & John, 2003). Some research has found significant cultural differences in the use of these strategies, with individuals from cultures that value independence tending to use suppression less than individuals from cultures that value interdependence and social order (e.g., Gross & John, 2003; Matsumoto, Yoo, Nakagawa, & 37 members of the Multinational Study of Cultural Display Rules, 2008). In addition, some studies have reported statistically significant gender differences on the use of suppression, with males scoring higher than females (Gross & John, 2003; Melka et al., 2011).

Research has shown the cognitive reappraisal subscale of the ERQ to be associated with greater positive affect, mood repair, life satisfaction, social functioning, and coping through interpretation, and negatively correlated with neuroticism, negative affect, anxiety, rumination, depression, and stress-related symptoms (Bastioni, Ordonez, da Silva, Nascimento, & Cachioni, 2013; Brans, Koval, Verduyn, Lim, & Kuppens, 2013; Cabello, Salguero, Fernández-Berrocal, & Gross, 2013; Gross & John, 2003; Moore et al., 2008; Wiltink et al., 2011). The expressive suppression subscale has been negatively associated with extraversion, mood repair, life satisfaction, social functioning, and positive affect, and positively related to negative affect, depression, inauthenticity, rumination, stress-related symptoms, and coping through venting (Brans et al., 2013; Cabello et al., 2013; Gross & John, 2003; Moore et al., 2008). With regard to the health domain, there is some evidence that higher levels of suppression may be associated with increased risk for cardiovascular diseases, while higher levels of reappraisal may be protective against such diseases (for a review see, Appleton & Kubzansky, 2014).
There are also experimental findings demonstrating the differential effects of using these two strategies. Experimental research typically involves randomly assigning participants to act naturally (i.e., control condition), or to use cognitive reappraisal or expressive suppression strategies in response to emotion-eliciting tasks or situations. Such research demonstrates that expressive suppression decreases the behavioural expression of emotion compared to control conditions, however it does not reduce the subjective experience of negative emotion (Gross, 1998b, 2002; Gross & Levenson, 1997). Rather, compared to no regulation efforts, the use of expressive suppression decreases the subjective experience of positive emotion (e.g., Brans et al., 2013; Gross, 1998a; Gross & Levenson, 1993), increases sympathetic nervous system activation (e.g., Demaree et al., 2006; Gross, 1998a; Gross & Levenson, 1993, 1997), and leads to greater activation of the amygdala (Goldin, McRae, Ramel, & Gross, 2008). Given that the goal of ER is to decrease negative emotional experience, expressive suppression is considered a maladaptive strategy, as it is not only ineffective for decreasing negative emotions in the short-term, it actually enhances physiological arousal and is associated with difficulties in the long-term, such as the experience of greater negative emotion and less positive emotion overall, poorer interpersonal functioning, and lower wellbeing (Gross & John, 2003). While expressive suppression may be adaptive in some contexts and Gross (2014) cautions against classifying some ER strategies as worse than others, the habitual use of expressive suppression is considered maladaptive given these negative outcomes for health and wellbeing.

In contrast, experimental research demonstrates that cognitive reappraisal leads to decreased levels of negative emotional experience (e.g., Feinberg, Willer, Antonenko, & John, 2012; Gross, 1998a; Lieberman, Inagaki, Tabibnia, & Crockett, 2011; Ray, McRae, Ochsner, & Gross, 2010; Wolgast, Lundh, & Viborg, 2011). Furthermore, individuals who employ reappraisal strategies experience and express more positive emotions, self-esteem, and psychological wellbeing, and less negative emotions, including fewer depressive symptoms (e.g., Gross & John, 2003; Nezlek & Kuppens, 2008). Research shows that reappraisal has either no impact or actually decreases sympathetic nervous system responses (e.g., Gross, 1998a; S. H. Kim & Hamann, 2012; Wolgast et al., 2011) and is associated with lowered activation in emotion-generative brain regions such as the amygdala (e.g., Goldin et al., 2008; Kanske et al., 2011; Ochsner & Gross, 2008).
To illustrate the differential effects of strategy use, research has shown that compared to individuals assigned to an ‘acceptance of emotions’ group, individuals assigned to a ‘suppression group’ exhibited higher negative affect after watching an emotion-provoking film, and the suppression group had increased heart rate, while the acceptance group had decreased heart rate (Campbell-Sills, Barlow, Brown, & Hofmann, 2006b). Likewise, research has found that compared to a control group, participants in both a reappraisal group and an acceptance group exhibited significantly less subjective distress, physiological responses and behavioural avoidance (Wolgast et al., 2011). Other research suggests that the use of reappraisal, distraction, and affect labelling (i.e., putting feelings into words) have similar effects on self-reported distress (Lieberman et al., 2011).

Studies investigating the neurobiological underpinnings of the habitual use of these two strategies have revealed distinct brain structural variations and functional activation differences during cognitive reappraisal and expressive suppression (Cutuli, 2014). For example, studies utilising functional magnetic resonance imaging (fMRI) show that the use of cognitive reappraisal and mindfulness strategies lead to similar activity of the medial frontal cortex and amygdala, and that both strategies activate common neural circuits known to be involved in ER (Opialla et al., 2015). Likewise, affect labelling and reappraisal are associated with similar decreases in amygdala activity, and correlated reductions in self-reported distress (Burkland, Creswell, Irwin, & Lieberman, 2014). In contrast, expressive suppression is associated with increased activation in the prefrontal cortex, insular, and amygdala (Goldin et al., 2008; Vanderhasselt, Baeken, Van Schuerbeek, Luypaert, & De Raedt, 2013). For a review of the neural bases of cognitive reappraisal and expressive suppression, see Cutuli (2014).

**Empirical research on emotion regulation strategy use and psychopathology.**

Several meta-analytic reviews have investigated the relationship between psychopathology and some of the ER strategies described by the process model (Gross, 1998b, 2015a). In general, maladaptive ER strategies such as avoidance, rumination, and suppression (including expressive and thought suppression), are associated with greater psychopathology, and adaptive strategies, such as acceptance, problem solving, and reappraisal, are associated with less psychopathology (Aldao et al., 2010; Hu et al., 2014). However, some ER strategies appear to be more strongly related to overall psychopathology than others. For example, rumination is positively associated with
psychopathology to a large effect, while strategies such as avoidance, problem solving, and suppression demonstrate a medium to large effect, and reappraisal demonstrates a small to medium effect (Aldao et al., 2010).

In a meta-analytic review of experimental studies, T. L. Webb, Miles, et al. (2012) examined the strategies derived from Gross’ (1998b) process model of ER, and found that there are differences in the effectiveness of ER processes on emotional outcomes, as measured by experiential, behavioural, and physiological indicators. Overall, attentional deployment strategies demonstrated no effect on emotional outcomes, while cognitive change strategies had a small to medium effect, and response modulation strategies had a small effect on emotional outcomes (T. L. Webb, Miles, et al., 2012). Differences were also found within the process families. For example, within the attentional deployment family, the use of distraction strategies had a positive effect on emotional outcomes, while strategies involving concentration had a negative effect (see T. L. Webb, Miles, et al., 2012 for further details on the sub-types of distraction and concentration strategies). Within the cognitive change family, all forms of reappraisal demonstrated reliable positive effects. However, reappraising the emotional response was less effective than was reappraising the emotional stimulus or using perspective taking (T. L. Webb, Miles, et al., 2012). Within the response modulation family, expressive suppression had a small to medium effect on emotional outcomes, while suppressing thoughts of the emotion-eliciting event, or suppressing both the expression and the experience of emotions were not effective. These results suggest that individuals are effective at regulating their behavioural expressions of emotion, however this form of suppression appears to be distinct from experiential and physiological suppression (see T. L. Webb, Miles, et al., 2012).

Generally, the use of overt behaviours as serving an ER function has received less empirical attention than covert strategies that occur within the individual (Aldao & Dixon-Gordon, 2014). However, overt behaviours can, under various circumstances, serve ER functions and have been described under aspects of the process model of ER (Aldao & Dixon-Gordon, 2014). For example, overt strategies such as avoiding situations is an example of problematic situation selection, while drinking alcohol may represent a way of modifying the emotional impact of the situation, or an example of a response modulation strategy (Gross, 1998b, 2014). In one investigation, Aldao and Dixon-Gordon (2014) found that the use of overt strategies such as drinking alcohol,
avoiding situations, arguing with others, and seeking advice were significant predictors of some forms of psychopathology above and beyond the more frequently studied covert strategies (e.g., worry/rumination, self-criticism, cognitive reappraisal, expressive suppression). Such research suggests the importance of investigating both covert and overt ER strategies given the differential relationships between these strategies and different forms of psychopathology (Aldao & Dixon-Gordon, 2014; Aldao et al., 2010).

Indeed, research indicates that individuals diagnosed with various clinical disorders may differ in their use of ER strategies, such as expressive suppression and cognitive reappraisal. To illustrate, research has found that individuals diagnosed with PTSD use suppression more often and with more effort than do non-PTSD individuals, and suppress both positive and negative emotions more than non-PTSD individuals do (Roemer, Litz, Orsillo, & Wagner, 2001). Furthermore, the frequency of suppression use has been associated with PTSD symptom severity (Roemer et al., 2001). Other research demonstrates that individuals with MDD and SAD use expressive suppression and rumination to a greater extent, and reappraisal to a lesser extent, than never-disordered controls (D'Avanzato, Joormann, Siemer, & Gotlib, 2013). Specificity of strategy use was also found for these clinical disorders, with greater use of rumination and less frequent use of reappraisal for depressed individuals than for socially anxious individuals, and greater use of expressive suppression by SAD individuals than by MDD individuals (D'Avanzato et al., 2013). Research utilising self-report and fMRI methods has found that compared to controls, participants with a history of self-harm demonstrated a lower ability to regulate emotion via reappraisal (Davis et al., 2014). Interestingly, other research has found no association between the use of suppression and reappraisal in a group of pathological gamblers (A. D. Williams et al., 2012).

The role of ER strategy use in the development, maintenance, and treatment of psychopathology is supported by longitudinal, mediational, and treatment outcome studies. For example, longitudinal research has found that lower cognitive reappraisal and higher emotional suppression predicts continued self-injury one-year later, distinguishing between adolescents who continue to self-injure from those who cease the behaviour (Andrews, Martin, Hasking, & Page, 2013). Other research demonstrates that individuals low in social anxiety who frequently display their negative or positive emotions openly (i.e., low expressive suppression), demonstrate the greatest increases in
positive affect three months later (Kashdan & Breen, 2007). Similarly, Wirtz, Hofmann, Riper, and Berking (2014) found that over a five-year period, general ER skills were negatively predictive of anxiety symptom severity, over and above baseline anxiety symptom severity. Furthermore, as anxiety symptom severity did not predict subsequent ER deficits, this research suggests that ER skills may play a key role in the development and maintenance of anxiety symptoms (Wirtz et al., 2014). For a detailed review of longitudinal studies conducted on strategies of rumination, avoidance, suppression, and problem solving, see Aldao et al. (2010).

Mediational studies also suggest that specific ER strategies impact indirectly on psychological outcomes. For example, in clinical and non-clinical samples, T. R. Lynch, Robins, Morse, and Krause (2001) found that the relationship between negative emotional intensity and psychological distress was mediated by attempts to suppress thoughts and emotions. Similarly, recent research demonstrates that the relationship between adverse life experience and psychological distress in adolescence is partially mediated by cognitive reappraisal, expressive suppression, and rumination (Boyes, Hasking, & Martin, 2015).

Finally, research suggests that changes in ER strategies underlie the effects of treatment interventions on psychological outcomes. Indeed, cognitive-behavioural therapies emphasise teaching reappraisal skills in order to address the maladaptive appraisal processes that are thought to underlie depression and anxiety disorders (Beck, 1976; Beck, Rush, Shaw, & Emery, 1979). For example, research shows that cognitive reappraisal is a mechanism of change in CBT for social anxiety (Kocovski, Fleming, Hawley, Ho, & Antony, 2015), and that threat reappraisal statistically mediates the effect of CBT on anxiety reduction (Smits, Julian, Rosenfield, & Powers, 2012). In addition, therapies other than CBT also impact positively on reappraisal strategies. For example, increases in dispositional mindfulness from pre- to post-intervention (i.e., an 8-week mindfulness-based stress and pain management program) have been associated with reciprocal increases in positive reappraisal, which was found to mediate the stress-reductive effects of increased mindfulness irrespective of changes in catastrophising (Garland, Gaylord, & Fredrickson, 2011). Likewise, a recent trial of ER therapy for individuals with GAD and comorbid depression found that participants had improvements in symptom severity, impairment, and quality of life, along with improved outcomes such as mindful attending and acceptance, decentering, and
cognitive reappraisal, and that these gains were maintained at three and nine months post-treatment (Mennin, Fresco, Ritter, & Heimberg, 2015).

**Summary.**

In summary, the process model of ER (Gross, 1998b) emphasises individual differences in the use of cognitive and behavioural strategies to modulate the intensity or frequency of emotional experiences at various points in the emotion-generative process. Research demonstrates that strategies encapsulated under the five ER processes are implicated in psychopathology and differentially associated with positive and negative outcomes. In particular, there is empirical support for the role of cognitive reappraisal and expressive suppression in the development, maintenance, and treatment of psychopathology.

While the process model (Gross, 1998b) is perhaps the most prominent model in the ER literature, the multidimensional conceptualisation of ER and dysregulation (Gratz & Roemer, 2004) is another well-recognised model that has been implicated in psychopathology. The following section provides an overview of this conceptualisation and construct, along with some of the empirical support for the role of this construct in relation to various forms of psychopathology.

**The multidimensional conceptualisation of emotion regulation & dysregulation.**

In consideration of the existing literature on ER and emotion dysregulation, Gratz and Roemer (2004) propose an integrative, multidimensional conceptualisation of ER. Their multidimensional model draws upon conceptualisations of ER that emphasises the functional nature of emotions (e.g., Cole, Michel, & Teti, 1994; Thompson, 1994). Such approaches deem problematic ER to involve a diminished capacity to experience and differentiate the full range of emotions (not just negative affect) and to respond spontaneously. Given that healthy ER involves monitoring, evaluating, and modifying the emotional experience, the awareness and understanding of emotions is considered a crucial component (Thompson & Calkins, 1996).

The multidimensional model also draws upon the difference between the control of, and the acceptance of emotional experience and expression, with the former being associated with increased physiological arousal, which in turn, may increase the risk for emotion dysregulation (e.g., Flett, Blankstein, & Obertynski, 1996; Gross & Levenson,
Likewise, secondary emotional responses to an initial emotional reaction have been suggested to be maladaptive and associated with greater ER difficulties (Cole et al., 1994; S. C. Hayes, Strosahl, & Wilson, 1999). As such, Gratz and Roemer’s (2004) conceptualisation is consistent with those emphasising the importance of accepting and valuing emotional responses (e.g., Cole et al., 1994; S. C. Hayes et al., 1999; Linehan, 1993).

Furthermore, in line with research suggesting the importance of context and the need to consider the goals of the individual and situational demands when evaluating effective ER (Cole et al., 1994; Thompson, 1994; Thompson & Calkins, 1996), the multidimensional model includes a component of flexibility in the use of ER strategies. Gratz and Roemer (2004) also draw upon theories that maintain that healthy ER involves modulating the intensity or duration of an emotion as opposed to eliminating the specific emotion experienced (e.g., Thompson, 1994; Thompson & Calkins, 1996). The modulation of arousal is proposed to assist with reducing the urgency associated with the emotion so that the individual can control their behaviour, instead of controlling their emotions (Gratz & Roemer, 2004), and this aspect of ER is consistent with theories that highlight the ability to restrain impulsive or inappropriate behaviour, and act in accordance with desired goals, as important components of ER (e.g., Linehan, 1993).

As such, Gratz and Roemer (2004) conceptualise ER as involving a) the awareness and understanding of emotions, b) the acceptance of emotions, c) the ability to inhibit impulsive behaviour and behave in accordance with desired goals when experiencing negative emotions, and d) the access to and ability to flexibly use ER strategies that are appropriate to the situation and that effectively alter the intensity and/or duration of emotional responses in order to meet individual goals. Deficits in any of these domains are indicative of difficulties in ER, or emotion dysregulation. An important feature of this model is that specific strategies are deemed neither effective nor ineffective, but rather the context must be considered when evaluating the appropriateness of ER strategies, hence the focus on the flexible use of situationally appropriate strategies (Gratz & Roemer, 2004). This model of ER implies that awareness and understanding of emotions in turn improves the ability to monitor, experience, accept, and spontaneously respond to the full range of emotional experience (Gratz & Roemer, 2004).
A key component as to the success of this conceptualisation was that Gratz and Roemer (2004) developed a measurement tool, the Difficulties in Emotion Regulation Scale (DERS). An initial factor analysis in an undergraduate psychology sample (\(N = 357\)) provided support for the multidimensional conceptualisation of ER, revealing six distinct, although related, factors of ER where difficulties may arise: 1) lack of emotional awareness, which reflects inattention to and lack of acknowledgement of emotional responses; 2) lack of emotional clarity, which refers to the extent to which individuals know and are clear about the emotions they are experiencing; 3) non-acceptance of emotional responses, which represents a tendency to experience negative emotions in response to one’s own emotional reactions, or a lack of acceptance of one’s reactions to distress; 4) limited access to ER strategies, which represents the belief that there is little that can be done to regulate emotions effectively once one is upset; 5) impulse control difficulties, which refers to experiencing difficulties with remaining in control of one’s behaviour under conditions of negative emotion; and 6) difficulties engaging in goal-directed behaviour, which represents difficulties concentrating and accomplishing tasks under conditions of negative emotion. In contrast to their theoretical suggestions, the results from the initial factor analysis revealed that there is a distinction between being aware of one’s emotions and having a clear understanding about the nature of one’s emotional responses. Likewise, there is a difference between being able to refrain from acting in undesired ways and engaging in desired behaviour when experiencing negative emotions (Gratz & Roemer, 2004).

The equivalent six-factor structure found for the DERS in adult samples has been confirmed in community adolescent samples (\(N = 870; Neumann, van Lier, Gratz, & Koot, 2010; N = 428; Weinberg & Klonsky, 2009\)), and an adolescent inpatient sample (\(N = 218\)), with most items loading strongly on their respective latent factor (Perez, Venta, Garnaat, & Sharp, 2012). Support for the six-factor structure has also been found for the Turkish (Sarıtaş-Atalar, Gençöz, & Özen, 2015), Italian (Giromini, Velotti, de Campora, Bonalume, & Cesare Zavattini, 2012), French (Dan-Glauser & Scherer, 2013), and Greek (Mitsopoulou, Kafetsios, Karademas, Papastefanakis, & Simos, 2013) versions of the DERS. However, several studies have not replicated the six-factor structure. For example, Tejeda, García, González–Forteza, and Palos (2012) did not find support for the six-factor structure of the DERS in a sample of non-clinical Mexican adolescents (\(N = 455\)), rather finding a four-factor solution with 24 items.
instead of 36. In a sample of Korean psychology students ($N = 345$), a five-factor model with a method factor for reverse-worded items was found to more adequately fit the data, with results suggesting that the lack of emotional awareness and lack of emotional clarity subscales can be combined into one construct, controlling for the method factor (Cho & Hong, 2013). Another study investigating the latent structure of the DERS on a large female undergraduate sample from the United States ($N = 1037$) suggested that the lack of emotional awareness factor may not represent the same higher-order ER construct as the other factors, and found that a revised 5-factor model (which removed the lack of emotional awareness factor) more adequately fit the data and did not weaken concurrent associations between the DERS and outcomes relevant to ER (Bardeen, Fergus, & Orcutt, 2012).

Most recently, Bardeen, Fergus, Hannan, and Orcutt (2016) and Lee, Witte, Bardeen, Davis, and Weathers (2016) identified some of the psychometric limitations of the DERS, which collectively suggest that the awareness subscale may not belong to the same higher-order construct as the others DERS subscales, and that the computation of a DERS total score including this subscale may not be appropriate. Indeed, Lee et al. (2016) found across three independent undergraduate samples that the six-factor higher-order model did not fit the data well, which raises concerns about the suitability of using the DERS total score. While a five-factor lower-order model excluding the awareness subscale appeared to best fit the data across the three samples, the higher-order model was not a good fit, suggesting that the DERS items are not characterised by a single-factor emotion dysregulation construct (Lee et al., 2016). In consideration of the possibility that the psychometric limitations of the scale may be accounted for, in part, by a method effect, Bardeen et al. (2016) recently investigated the psychometric support for a modified 29-item version of the DERS which involved rewording all of the reverse-scored items in the scale and ensuring a uniform stem for all of the items. Results showed that the awareness subscale was not identified as a distinct factor, but rather, in line with the original hypothesis of Gratz and Roemer (2004), loaded onto a factor with the clarity items (i.e., termed an ‘identification’ factor). The five-factor model demonstrated adequate fit for the lower-order and higher-order model across three independent samples (Bardeen et al., 2016).

Despite some inconsistencies in the literature about the psychometric properties of the scale, Gratz & Roemer’s (2004) conceptualisation of ER has been found to be
associated with other theoretically related ER measures. For example, the DERS is positively associated with experiential avoidance (Fowler et al., 2014; Gratz & Roemer, 2004; McHugh, Reynolds, Leyro, & Otto, 2013), and the total and subscale scores have been found to account for a significant amount of additional variance in experiential avoidance, above and beyond that accounted for by an extant measure of ER (Gratz & Roemer, 2004). All six facets of the DERS are also negatively associated with the reappraisal subscale of the ERQ, while the suppression subscale is positively correlated with all facets of emotion dysregulation except for impulse control difficulties (Bardeen & Fergus, 2014). Research suggests that difficulties with ER, as measured by the DERS, are associated with physiological indices of ER. For example, lower resting heart variability is predictive of greater ER difficulties (D. P. Williams et al., 2015), and improvements in physiological responding to emotional challenge over time are associated with fewer later self-reported ER difficulties (Vasilev, Crowell, Beauchaine, Mead, & Gatzke-Kopp, 2009).

**Empirical research on emotion regulation difficulties and psychopathology.**

There has been extensive research conducted with the DERS (Gratz & Roemer, 2004), which provides support for the relationship between ER difficulties and various symptoms of psychopathology and psychological disorders. For example, the DERS has been positively associated with self-harm behaviour (e.g., Gratz & Roemer, 2004, 2008; Perez et al., 2012), symptoms of posttraumatic symptom severity (e.g., Badour & Feldner, 2013; Tull et al., 2007), gambling behaviour (e.g., A. D. Williams et al., 2012), suicidal ideation (e.g., Weinberg & Klonsky, 2009), alcohol and drug use (e.g., Fox, Hong, & Sinha, 2008; Weinberg & Klonsky, 2009), dysfunctional eating (e.g., Stapleton & Whitehead, 2014), anxiety and depression severity (e.g., Fowler et al., 2014), obsessive-compulsive symptoms (e.g., Fergus & Bardeen, 2014; Fernández de la Cruz et al., 2013), eating disorders (e.g., Brockmeyer et al., 2014; Harrison, Sullivan, Tchanturia, & Treasure, 2009; Racine & Wildes, 2013; Svaldi, Griepenstroh, Tuschen-Caffier, & Ehring, 2012), GAD (e.g., Roemer et al., 2009; Salters-Pedneault, Roemer, Tull, Rucker, & Mennin, 2006; Tull, Stipelman, Salters-Pedneault, & Gratz, 2009), social anxiety disorder (e.g., Helbig-Lang, Rusch, & Lincoln, 2015), bipolar disorder (e.g., Van Rheenen, Murray, & Rossell, 2015), and BPD features and symptom severity (e.g., Fossati, Gratz, Maffei, & Borroni, 2013; Iverson, Follette, Pistorello, & Fruzzetti, 2012; Schramm, Venta, & Sharp, 2013).
To illustrate, Salters-Pedneault et al. (2006) investigated the DERS and GAD-related outcomes in an analogue sample. Emotion dysregulation (as measured by the DERS total and all facets except emotional awareness) was significantly positively associated with chronic worry and analogue GAD status, with the relationships remaining significant even after controlling for general negative distress. Additionally, individuals with analogue GAD had significantly higher levels of ER deficits compared to those without analogue GAD, even after controlling for negative affectivity (Salters-Pedneault et al., 2006). Another study found that in a community sample of adults, all facets of the DERS except for the lack of awareness subscale were significantly positively associated with total obsessive-compulsive symptoms and the symptom dimensions of contamination, responsibility, unacceptable thoughts, and symmetry (Fergus & Bardeen, 2014). Furthermore, both the impulse control and lack of emotional clarity subscales of the DERS, and the expressive suppression subscale of the ERQ, were found to account for unique variance in all obsessive-compulsive symptom dimensions after controlling for general distress and other ER variables (Fergus & Bardeen, 2014).

The role of ER difficulties in the development, maintenance, and treatment of psychopathology is supported by research utilising longitudinal, mediational, and treatment outcome designs. For example, emotion dysregulation has been found to predict the maintenance of anorexia nervosa symptom severity over the year following discharge from intensive treatment, with individuals high in emotion dysregulation experiencing an increase in and subsequent maintenance of anorexia nervosa psychopathology, while individuals low in emotion dysregulation had a decreasing symptom course (Racine & Wildes, 2015). Other research has found that ER difficulties prior to a campus shooting prospectively predict posttraumatic stress symptoms in the acute aftermath of the shooting, and from the acute aftermath time period to 8-months later (Bardeen, Kumpula, & Orcutt, 2013).

Research has also demonstrated that the DERS mediates the effect of a range of psychological variables. For example, the DERS has been found to mediate the relationship between BPD symptom severity and interpersonal problems (Herr, Rosenthal, Geiger, & Erikson, 2013), the relationship between anger and suicidal behaviour (Ammerman, Kleiman, Uyeji, Knorr, & McCloskey, 2015), the relationship between childhood maltreatment and intimate partner abuse among men (Gratz,
Paulson, Jakupcak, & Tull, 2009), and the relationship between insecure attachment and disordered eating in women (Ty & Francis, 2013). Likewise, overall emotion dysregulation, as measured by the DERS, has been found to fully mediate the relationship between PTSD and impulsive behaviours (Weiss, Tull, Viana, Anestis, & Gratz, 2012). With regard to specific facets of the DERS, a recent study found that greater emotional awareness and limited access to ER strategies were partial mediators in the relationship between sensory-processing sensitivity and depression (Brindle, Moulding, Bakker, & Nedeljkovic, 2015). Emotion regulation difficulties are implicated in the relationship between mindfulness and psychosocial distress, with the non-acceptance of emotions and lack of access to effective strategies facets of the DERS partially mediating the relationship between low mindfulness and symptoms of psychological distress (Pepping, O'Donovan, Zimmer-Gembeck, & Hanisch, 2014). Such research highlights the relevance of emotion dysregulation to psychological symptoms, suggesting that treatments targeting emotion dysregulation may be beneficial.

Indeed, there is a growing body of literature demonstrating that improved ER, as measured by the DERS, mediates treatment outcomes. For example, Gratz and colleagues (2015) examined ER as a mechanism of change in their ER group therapy program for reducing deliberate self-harm in women with BPD, and found that improvements in emotion dysregulation (as measured by the DERS) mediated the effects of treatment on BPD symptoms and predicted improvements in deliberate self-harm at the 9-month follow-up. Similarly, other research has found that improvements in ER (but not improved mood) explained the variance in reduced substance abuse frequency of BPD women after a 20 week program of DBT (Axelrod, Perepetchikova, Holtzman, & Sinha, 2011). A recent randomised controlled trial (RCT) of a 12-week acceptance and commitment therapy (ACT) program for aggressive behaviour demonstrated that the ACT group had significantly decreased physical and psychological aggression compared to a support and discussion control group, and that lower levels of emotion dysregulation (as measured by the DERS) at posttreatment partially mediated reductions in physical aggression at 6-month follow-up (Zarling, Lawrence, & Marchman, 2015).

Finally, the DERS accounts for unique variance in psychopathology above and beyond other theoretically related ER constructs. For example, emotion dysregulation,
as measured by the DERS total score, was found to be a significant and unique predictor of PTSD status among substance use disorder patients above and beyond facets of impulsivity (Weiss, Tull, Anestis, & Gratz, 2013). Similarly, while an emotion modulation skills training manipulation resulted in improvements in both emotion dysregulation and facets of impulsivity one week later, improvements in emotion dysregulation accounted for the significant reduction in risky behaviours over time, above and beyond changes in impulsivity (Weiss, Tull, Davis, et al., 2015). With regard to specific strategies, Bardeen and Fergus (2014) established that overall emotion dysregulation, as measured by the DERS, predicted unique incremental variance in health anxiety beyond the ER strategies of suppression and reappraisal. Such research provides support for the distinctiveness of the DERS from other theoretically related constructs.

**Summary.**

In summary, the DERS model (Gratz & Roemer, 2004) emphasises the functional nature of emotions and individual differences in one’s cognitive and behavioural responses to emotions. Research demonstrates that emotion dysregulation is associated with negative outcomes and functioning in both clinical and non-clinical populations, and is implicated in the development, maintenance, and treatment of psychopathology. Furthermore, the DERS mediates the impact of a range of psychological variables and the effects of treatment outcomes, and contributes additional value to other established ER constructs.

**Contrasting the Two Conceptualisations of Emotion Regulation**

As demonstrated by the preceding discussion of two contemporary models of ER, researchers differ in the way they conceptualise ER and the emphasis they attribute to particular aspects of ER. While the two models do share some conceptual overlap (e.g., both models consider effective ER to involve an awareness of emotions and emphasise the importance of context and the individual’s goals in assessing the appropriate use of ER strategies), they differ in terms of their central focus. That is, while Gross’ (1998b) model emphasises individual differences in the use of cognitive and behavioural strategies to modulate the intensity or frequency of emotional experiences, Gratz and Roemer’s (2004) conceptualisation is less concerned with the application of specific strategies and rather more strongly emphasises individual
differences in emotional awareness, perceived capacity to manage emotions, and appraisal of emotions (Johnson, 2013). While the former appears to be more concerned with the process of intentionally regulating emotions (i.e., how and when one attempts to alter an emotional experience), the latter appears to more broadly reflect one’s general perceived ER skills and ability to function when emotional (Johnson, 2013). However, both aspects are important, as it is likely that an individuals’ perception of themselves as having ER difficulties (e.g., perhaps by being unaware of which emotions they are experiencing, or by being unaccepting of emotions), will impact the specific ER strategies they use to attempt to modulate their emotional experience (Johnson, 2013). Indeed, research has suggested that conscious awareness of emotions may facilitate the use of reappraisal as an adaptive ER strategy (Subic-Wrana, Beutel, & Brahler, 2014). Likewise, research shows that beliefs about emotions being unacceptable mediated the relationship between negative emotional intensity and the use of suppression (Campbell-Sills, Barlow, Brown, & Hofmann, 2006a). Similarly, as noted earlier, appraisals about one’s ability to effectively manage emotions (i.e., access to effective ER strategies) has been found to predict health anxiety beyond the contribution of cognitive reappraisal and expressive suppression (Bardeen & Fergus, 2014). Such research suggests that individual differences in ER abilities or emotional competence, is different from the specific processes one uses to regulate emotion (see Diaz & Eisenberg, 2015; John & Eng, 2014); however both are important features of ER.

Indeed, a recent examination of the structure of ER as informed by Gross’ (1998b) process model suggested that ER may be conceptualised by a combination of factors of specific strategy use (i.e., situation selection, attentional deployment, cognitive change, and response modulation) and a broader factor, termed ‘emotional distancing’ (Seligowski & Orcutt, 2015). This latter factor was comprised of measures of acceptance, experiential avoidance, and thought suppression, and appears to represent a trait-like disposition towards emotions rather than a strategy in itself. As the novel five-factor model adequately fit the data, this research suggests that the construct of ER may be comprised of one’s stance towards emotions as well as the specific strategies one uses to regulate emotions. Seligowski and Orcutt (2015) suggest that both components are necessary for understanding how individuals regulate their emotions, and will inform treatment interventions. For example, if individuals report greater
difficulties accessing and employing strategies to regulate their emotions, interventions such as DBT (Linehan, 1993) may be appropriate given the strong emphasis on specific skills. In contrast, for individuals who have a strong tendency to resist their emotions or judge themselves harshly for experiencing particular emotions, perhaps interventions such as mindfulness, ACT, or self-compassion (Gilbert, 2009; S. C. Hayes et al., 1996; Kabat-Zinn, 1990; Neff & Germer, 2013) may be more appropriate given their emphasis on acceptance (Seligowski & Orcutt, 2015).

Other Related Emotion Regulation Constructs

There are many constructs in the field of psychology that purport to measure ER and that appear to share some conceptual overlap with the two models outlined above. The following sections pertain to a discussion of three such constructs (i.e., experiential avoidance, alexithymia, and impulsivity). Each construct is described and considered in relation to its overlap with and distinction from other ER constructs, and some of the empirical support for each construct in relation to psychopathology is noted.

**Experiential avoidance.**

One ER construct that has gained widespread interest in the field of psychology is experiential avoidance (EA), which refers to an unwillingness to endure unpleasant internal experiences (e.g., thoughts, emotions, memories, physiological sensations) and deliberate attempts to control or escape from such experiences (S. C. Hayes et al., 1996). Experiential avoidance involves avoidance and escape attempts in any form (cognitive or behavioural) that serve as a means for altering the form and frequency of these internal experiences (S. C. Hayes et al., 1996). Importantly, EA is distinguished from simply avoiding aversive events, in that EA involves engaging in avoidance or escape behaviour when doing so is ineffective or causes additional suffering (Boulanger, Hayes, & Pistorello, 2010). When the attempts to control or avoid private experiences are used rigidly and inflexibly, EA can consume a significant amount of time and cognitive resources, which only serves to exacerbate and maintain symptoms of psychological distress and interferes with the pursuit of valued goals (S. C. Hayes et al., 1996; 1999). In contrast, acceptance refers to the willingness to experience unpleasant private experiences that will inevitably arise, and pursuing actions that are consistent with one’s values (S. C. Hayes et al., 1999).
The construct of EA originates from ACT (S. C. Hayes et al., 1996; S. C. Hayes et al., 1999), which aims to address EA by cultivating acceptance. According to ACT, EA and acceptance are viewed as examples of broader concepts of psychological inflexibility, and psychological flexibility, respectively. That is, psychological inflexibility is thought to be represented by EA, entanglement with thoughts, loss of contact with the present moment, attachment to a conceptualised self, and failing to take action consistent with one’s core values (S. C. Hayes et al., 2006; S. C. Hayes et al., 1999). In an effort to control or avoid unwanted experiences, individuals high in EA may engage in behaviour that is harmful to their physical, emotional or psychological wellbeing. Moreover, such efforts to control internal experiences can paradoxically exacerbate the frequency and intensity of those experiences, which can result in psychopathology (S. C. Hayes et al., 1999).

The most commonly used measure of EA is the Acceptance and Action Questionnaire (AAQ; S. C. Hayes et al., 2004). The original item pool was based on the theory underlying ACT and contained items addressing entanglement with thoughts, negative evaluations of emotions, and the inability to take action in the face of difficult private experiences, along with items addressing control, avoidance, and escape of such negative private events (S. C. Hayes et al., 2004). The original validation study of the AAQ demonstrated 9- and 16-item single-factor versions (S. C. Hayes et al., 2004), while other research identified a two-factor 16-item version (Bond & Bunce, 2003). Due to shortcomings in areas such as comprehensibility, internal consistency, and in having a stable factor structure, revised 10- and 7-item versions of the scale (i.e., AAQ-II) were developed, with the 7-item version demonstrating satisfactory one-factor structure, internal consistency, and validity, with superior psychometric properties to the 10-item version and the original AAQ (Bond et al., 2011).

Experiential avoidance, as measured by various versions of the AAQ (Bond et al., 2011; S. C. Hayes et al., 2004), has been shown to be associated with various indices of emotional responding. For example, experimental research demonstrates that compared to individuals low in EA, individuals high in EA report heightened subjective emotional experience in response to both unpleasant and pleasant emotion-eliciting material (Sloan, 2004), and have an emotional information processing bias towards making negative emotion inferences (Pickett & Kurby, 2010). Increased EA is associated with reduced activation in frontal and limbic regions (see Schlund, Magee, &
Hudgins, 2011), and individuals high in EA demonstrate greater thought intrusion, higher interference, and lower concentration on a working-memory task after viewing a discomforting film (López et al., 2010).

**Overlap with and distinction from other ER constructs.**

Given the above definition of EA, it is apparent that the construct shares conceptual overlap with the two previous conceptualisations of ER. With regard to Gross’ (1998b) model, EA appears to conceptually overlap with a range of ER strategies that represent attempts to control or escape from aversive private experiences. While Werner and Gross (2010) suggest that EA is a form of response modulation, and therefore may be considered an ER strategy in itself, it has been argued that EA better represents an ER function (Boulanger et al., 2010). That is, EA has been conceptualised as a functional response category, in that any behaviour that serves an avoidant or escape function may be considered EA. As such, EA may be involved in all five processes of ER as described in Gross’ (1998b) process model (Boulanger et al., 2010). For example, EA may be evident in behavioural avoidance strategies under situation selection and situation modification, strategies of distraction, rumination, and worry under attentional deployment, thought suppression under cognitive change, and expressive suppression under response modulation (for a detailed discussion, see Boulanger et al., 2010). While such ER strategies may appear to be distinct on the surface, they can share an underlying EA function. Whether ER strategies are effective or ineffective depends on the extent to which they represent an attempt to control and avoid internal experiences. In the case where an ER strategy serves an EA function, that strategy is associated with greater psychopathology, whereas that same strategy used for another function is likely to have different outcomes (Boulanger et al., 2010). For further reading on how EA might serve an ER function for various strategies intervening at different points in the emotion-generative process of Gross’ (1998b) model, see Wolgast, Lundh, and Viborg (2013).

With regard to Gratz and Roemer’s (2004) conceptualisation of ER, the unwillingness to experience unpleasant emotions aspect of EA appears to be similar to the DERS facet of non-acceptance of emotional responses, and EA may also be represent a lack of access to effective ER strategies. Indeed, as noted earlier, research shows that the DERS is strongly positively associated with EA (e.g., McHugh et al., 2013), with the overall scale and subscale scores of the DERS accounting for a
significant amount of additional variance in EA (Gratz & Roemer, 2004). However, these constructs appear to differ in that EA involves deliberate attempts to escape, control, or avoid difficult emotions (S. C. Hayes et al., 1996), whereas emotion dysregulation involves a broader range of difficulties with monitoring, evaluating, and modulating (not eliminating) emotional responses (Gratz & Roemer, 2004).

Another conceptually similar construct to EA is distress tolerance (DT), which refers to the capacity to withstand and experience negative psychological states (Simons & Gaher, 2005). Distress tolerance is considered to be a meta-emotional construct, comprised of an individual’s evaluations and expectations of negative emotional states in terms of tolerability, appraisal, regulation, and absorption (Simons & Gaher, 2005). As such, DT and EA appear to share conceptual overlap with regard to a lack of acceptance of distress and efforts to avoid negative emotions. Low DT is strongly associated with EA (McHugh et al., 2013), and all four components of distress intolerance (i.e., tolerance, absorption, regulation, and appraisal) demonstrate moderate to strong correlations with EA (A. D. Williams, 2012). The distinction between the two constructs appears to be that DT includes additional components of appraisals of distress that are characterised by lack of acceptance and shame, perceptions that one’s coping abilities are poorer than others, and having attention absorbed and feeling consumed by one’s emotional experience when one is unsuccessful at alleviating negative emotions (Simons & Gaher, 2005).

Despite the definitional overlap and high correlations found between the DERS, distress intolerance, and EA (McHugh et al., 2013), there is some evidence that they are related, but not completely overlapping constructs. For example, distress intolerance and deficits in access to ER strategies are significantly and incrementally associated with EA (McHugh et al., 2013). Iverson et al. (2012) found the DERS, distress intolerance, and EA to be strongly related, however regression analyses revealed that EA accounted for unique variance in BPD symptomatology in a young adult outpatient sample, after controlling for emotion dysregulation and depression. Furthermore, studies including other related ER constructs highlight the mediational role of EA. For example, EA has been found to mediate the impact of anxiety sensitivity on depression (Tull & Gratz, 2008), the relationship between alexithymia and ER difficulties (Venta, Hart, & Sharp, 2013), the association between emotion dysregulation and BPD features (Schramm et al., 2013), and the relationship between DT and compulsive buying (A. D.
With regard to specific strategies, Kashdan, Barrios, Forsyth, and Steger (2006) found that EA mediates the relationship between ER strategies (i.e., suppression and reappraisal) and outcomes (i.e., negative and positive, respectively). Such research suggests that EA is distinct from other ER concepts, and represents both a generalised vulnerability construct and a toxic psychological process (Boulanger et al., 2010; Kashdan et al., 2006).

**Empirical research on experiential avoidance and psychopathology.**

Experiential avoidance has been suggested to be critical in the development and maintenance of psychopathology (S. C. Hayes et al., 1999), and over the past 15 years there has been a growing body of research demonstrating that EA is implicated in a wide range of psychological disorders and behavioural problems. For example, Chawla and Ostafin (2007) conducted an empirical review on the role of EA in the etiology, maintenance, and treatment of psychopathology, identifying 28 studies published between 1999 and 2006 examining its role, the majority of which had utilised the 9-item or 16-item version of the AAQ (S. C. Hayes et al., 2004). Despite some inconsistencies between studies, the general conclusion of the review was that EA was positively associated with substance use and relapse, GAD, trichotillomania, PTSD, and general psychological distress (see Chawla & Ostafin, 2007 for an extensive review). Likewise, a meta-analysis of 32 studies involving 6,628 participants demonstrated that EA, as measured by the AAQ, was strongly associated with measures of depression, mental illness, and anxiety (S. C. Hayes et al., 2006). Experiential avoidance was also positively associated with PTSD symptoms and severity, substance abuse, deliberate self-injury, intolerance of chronic pain, social phobia, and stress, while higher levels of psychological flexibility (i.e., low EA) were associated with better quality of life and outcomes (S. C. Hayes et al., 2006).

A more recent meta-analysis by Bluett, Homan, Morrison, Levin, and Twohig (2014) examined the relationship between EA (as measured by various versions of the AAQ and AAQ-II), and anxiety and OCD spectrum disorders across 63 studies. Results demonstrated significant medium correlations between the AAQ/AAQ-II and measures of anxiety, general anxiety symptoms, and specific anxiety disorder symptoms such as obsessive-compulsive or panic symptoms. Additional analyses revealed that the AAQ/AAQ-II had large and significant correlations with measures of GAD, medium and significant correlations with measures of social phobia and OCD, and small but
significant correlations with panic/agoraphobia. Furthermore, medium correlations between the AAQ/AAQ-II and measures of anxiety were found for both non-clinical and clinical/at risk samples, with no significant difference between the two groups. This pattern was replicated for measures of specific anxiety disorder symptoms (Bluett et al., 2014). Research has also demonstrated positive associations between EA and schizophrenia (for a meta-analysis, see O'Driscoll, Laing, & Mason, 2014), eating psychopathology (e.g., Cowdrey & Park, 2012; Oldershaw, Lavender, Sallis, Stahl, & Schmidt, 2015; Rawal, Park, & Williams, 2010), and BPD (Chapman, Gratz, & Brown, 2006; Chapman, Specht, & Cellucci, 2005; Iverson et al., 2012; Schramm et al., 2013).

Empirical research provides support for the role of EA in the development, maintenance, and treatment of various forms of psychopathology. For example, longitudinal research has demonstrated that EA predicts PTSD symptoms over a 2-month period (Marx & Sloan, 2005) and at 1-month and 8-month post-trauma (Kumpula, Orcutt, Bardeen, & Varkovitzky, 2011), and predicts changes in “distress” disorders (i.e., MDD, dysthymia, GAD) and “fear” disorders (i.e., social anxiety disorder, panic disorder with or without agoraphobia, agoraphobia without panic) two years later (Spinhoven, Droste, de Rooij, van Hemert, & Penninx, 2014). Such research suggests that EA affects the course of current disorders, and also increases the risk for future disorders (Spinhoven et al., 2014).

There is also a growing body of research demonstrating that improvements in EA mediate the effects of treatment interventions specifically intended to reduce it (e.g., Bohlmeijer, Fledderus, Rokx, & Pieterse, 2011; Bond & Bunce, 2000; Lillis, Hayes, Bunting, & Masuda, 2009; Twohig, Vilardaga, Levin, & Hayes, 2015; Zarling et al., 2015). For example, mindfulness- and acceptance-based therapies aim to reduce an individual’s attempts at suppressing their emotional experience and expression through increasing psychological flexibility and the willingness to experience internal states (S. C. Hayes et al., 1999; S. C. Hayes et al., 1996). Indeed, research shows that session-by-session changes in the acceptance of internal experiences during acceptance-based behaviour therapy for GAD predicts better outcomes and higher quality of life post-treatment (S. A. Hayes, Orsillo, & Roemer, 2010). Similarly, other research has shown that improvements on the AAQ-II during an early intervention based on ACT for depression mediated the effects of the intervention on depressive symptoms (Bohlmeijer et al., 2011), and that EA during treatment significantly mediated reductions in post-
treatment symptoms of social anxiety and anhedonic depression for ACT but not CBT (Niles et al., 2015).

Summary.

In summary, research suggests that EA plays an important role in the development, maintenance, and treatment of psychopathology. Conceptualised as a transdiagnostic, functional construct rather than merely an ER strategy, EA is associated with diminished quality of life and functioning in both clinical and non-clinical populations, mediates the effect of acceptance-based treatments, and contributes additional value to other established ER constructs (for a detailed review, see Boulanger et al., 2010).

Alexithymia.

The term alexithymia was first coined by Sifneos (1973) to describe the cluster of cognitive and affective characteristics of patients with psychosomatic diseases who were observed to have problems with psychoanalysis due to difficulties identifying and verbalising their emotions. Alexithymia is considered to be a multifaceted personality construct characterised by difficulties identifying and describing feelings, difficulties distinguishing between feelings and bodily sensations, a constricted imagination and fantasy life, and an externally-oriented cognitive style (Nemiah, Freyberger, & Sifneos, 1976; G. J. Taylor, 2000; G. J. Taylor, Bagby, & Parker, 1997).

As human beings use language to identify and express their feelings, the development of emotional awareness and skills for emotional expression is thought to be embedded in cognitive development (Lane & Schwartz, 1987). While all people have emotions in terms of neurophysiological arousal, how one feels their emotions depends on one’s subjective cognitive understanding and experiences. That is, without adequate words to describe such neurophysiological responses, individuals cannot accurately feel (identify and describe) emotions, and therefore will have difficulties regulating behaviours that follow emotional experiences (Lane & Schwartz, 1987; G. J. Taylor et al., 1997). As such, alexithymia reflects deficits in the cognitive processing and regulation of emotions (G. J. Taylor, 2000).

The deficits underlying alexithymia have in part been attributed to impaired affect development during early childhood, with alexithymic individuals thought to have not fully developed the ability to cognitively identify feelings accurately by
recognising specific physiological signs of emotions (G. J. Taylor et al., 1997). Due to this lack of emotional awareness, alexithymic individuals are characterised by affective dysregulation and the inability to self-soothe and regulate emotions (G. J. Taylor et al., 1997). As identified by Berenbaum (1996), individuals with higher levels of alexithymia may be at risk of developing psychopathology because they are unlikely to benefit from the feedback offered by emotions, which therefore may impair the regulative function of emotions.

The construct of alexithymia has been investigated from a range of perspectives and methodologies, including neurobiological, linguistic, developmental, physiological, and behavioural (for reviews, see Donges, Kersting, & Suslow, 2014; Messina, Beadle, & Pardiso, 2014; G. J. Taylor & Bagby, 2004; van der Velde et al., 2013). While a detailed discussion of the research on alexithymia is outside the scope of this chapter, it is worth noting some of the research findings regarding physiological reactivity and emotional processing.

With regard to autonomic responding, the research on alexithymia is inconsistent, with some studies suggesting evidence for elevated physiological arousal, while the majority of studies demonstrate either lower or comparable physiological responding between high and low alexithymic individuals during periods of stress (for a review, see G. J. Taylor, 2000). However, there does appear to be evidence that subjective experiences are decoupled from autonomic reactivity in alexithymia, with experimental studies demonstrating that there is greater self-reported negative affect in alexithymic individuals relative to their physiological arousal (e.g., Connelly & Denney, 2007; Eastabrook, Lanteigne, & Hollenstein, 2013; Newton & Contrada, 1994).

Emotion recognition focuses on the ability to accurately identify emotions, and emotional processing deficits are implicated in alexithymia. Utilising verbal and non-verbal stimuli, research has found that alexithymia is associated with an impaired ability in recognising and processing emotional expressions on faces and in linguistic emotional stimuli (e.g., Cook, Brewer, Shah, & Bird, 2013; Donges et al., 2014; Grynberg et al., 2012; Lane et al., 1996; Luminet, Vermeulen, Demaret, Taylor, & Bagby, 2006). Compared to low alexithymic individuals, high alexithymic individuals recall fewer positive and negative emotional words, which suggests that individuals high in alexithymia have a deficit in the ability to consciously access emotional and meaningful material (Luminet et al., 2006). Given that ER involves the ability to
represent emotions symbolically, particularly through language, and to associate them in a meaningful way with past emotional experience, a deficit in this area may help explain the impaired regulation of emotional states by individuals high in alexithymia (Luminet et al., 2006).

Research also suggests that alexithymic individuals have deficits in the perception and processing of speech prosody with emotional content (Gorlich-Dobre et al., 2014), along with problems with emotional language production and comprehension. For example, alexithymia is associated with concrete thinking and circumventing the use of metaphors (Kreitler, 2002). When giving personal narratives, individuals high on alexithymia tend to use vocabulary that lacks complexity, and there is often an absence of vivid descriptions in their emotional dialogue (Meganck, Vanheule, Inslegers, & Desmet, 2009). Furthermore, alexithymic individuals exhibit a restricted ability to talk about interpersonal relationships (Meganck et al., 2009) and understand the emotions of others (Swart, Kortekaas, & Aleman, 2009). Finally, neuroimaging research shows that alexithymia is associated with decreased activation in a range of brain areas implicated in the processing of emotional stimuli (Jongen et al., 2014; for a meta-analysis, see van der Velde et al., 2013). Due to such emotional processing deficits, it is unsurprising that individuals high in alexithymia have difficulties in tolerating and regulating emotional distress and arousal (Chen, Xu, Jing, & Chan, 2011; Gaher, Hofman, Simons, & Hunsaker, 2013; Majohr et al., 2011; Pandey, Saxena, & Dubey, 2011; Stasiewicz et al., 2012).

To date, the 20-item version of the Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994) is the most widely used self-report measure of alexithymia. The item content of the scale measures the clinical features of alexithymia: difficulty identifying feelings, difficulty describing feelings, and externally-oriented thinking. The difficulty identifying feelings subscale refers to an individual’s difficulty with distinguishing between feelings, the bodily sensations that accompany emotional arousal, and identifying feelings within oneself. The difficulty describing feelings subscale refers to difficulties with communicating one’s subjective feelings to others, while the externally-oriented thinking subscale refers to a disposition to focus on external rather than internal events and experiences, and in part, reflects a constricted inner fantasy life (Bagby, Parker, et al., 1994; Parker, Bagby, Taylor, Endler, & Schmitz, 1993).
**Overlap with and distinction from other ER constructs.**

As demonstrated by the definition of alexithymia, the construct shares conceptual similarity with the lack of emotional awareness and lack of emotional clarity facets of Gratz and Roemer’s (2004) multidimensional model of emotion dysregulation. Alexithymia would also be problematic in Gross (1998b) model given that emotional awareness is deemed a feature of effective ER. As noted by Gross and Jazaieri (2014), without emotional awareness it is difficult for individuals to employ sophisticated ER strategies. Theoretically, not knowing what emotions one is experiencing is likely to impair one’s ability to effectively use reappraisal in order to modulate those emotional responses, and is likely to prompt the use of maladaptive efforts to suppress the experience and expression of such emotions. Similarly, individuals who experience difficulty with identifying and describing their emotional states are likely to be unable to tolerate or accept such states (particularly difficult emotions), and to be more likely to make efforts to avoid or escape from such states (Venta et al., 2013), which suggests that alexithymia may be related to other ER constructs such as EA and DT.

Indeed, research has demonstrated relationships between alexithymia and ER constructs. For example, the construct of emotional intelligence is a personality construct referring to the ability to monitor feelings (of self and others), distinguish between them, and use this information to guide thinking and action (Salovey & Mayer, 1990). Research suggests that emotional intelligence is strongly and inversely associated with alexithymia, and that they represent independent but overlapping constructs (Onur, Alkm, Sheridan, & Wise, 2013; Parker, Taylor, & Bagby, 2001; Salovey & Mayer, 1990). Regarding ER strategies, alexithymia has been negatively correlated with the use of reappraisal (Stasiewicz et al., 2012; Swart et al., 2009), and positively associated with the use of suppression (Laloyaux, Fantini, Lemaire, Luminer, & Larøi, 2015; Stasiewicz et al., 2012). Furthermore, a recent study suggests that having clarity about the type of emotion one is experiencing facilitates the effective use of reappraisal and acceptance strategies in appropriate contexts (Boden & Thompson, 2015). Indeed, research has found that individuals who report their negative emotional experiences with greater detail and granularity (i.e., emotion differentiation) utilised almost 30% more ER strategies to reduce their negative emotions and increase positive emotions, compared to individuals low in emotion differentiation (Barrett, Gross, Christenson, & Benvenuto, 2001). Alexithymia has demonstrated strong correlations
with EA (e.g., Berrocal, Pennato, & Bernini, 2009; Panayiotou et al., 2015) and distress intolerance (e.g., Gaher et al., 2013; Rose & Segrist, 2012), and moderate to strong associations with the DERS (e.g., Stasiewicz et al., 2012; Venta et al., 2013). Indeed, the lack of awareness and lack of clarity facets of the DERS are strongly positively associated with alexithymia (Stasiewicz et al., 2012).

Despite these associations and conceptual overlap, these constructs appear to be distinct. For example, research has shown that alexithymia and EA are both independent predictors of negative psychological outcomes (Berrocal et al., 2009). Pandey et al. (2011) compared alexithymic (n=27) and non-alexithymic (n=26) participants on measures of ER and mental health. Given the overlap between alexithymia and the DERS construct, the authors anticipated that alexithymic individuals would experience ER difficulties, and sought to assess the overlap between these two constructs and clarify the role of ER difficulties in the alexithymia-mental health relationship. Results demonstrated that alexithymic participants had greater ER difficulties as measured by the DERS, and that these difficulties distinguished between the two groups with high accuracy. Furthermore, alexithymic participants reported greater mental health problems compared to non-alexithymic participants; however after controlling for the effect of ER difficulties, the difference between groups was no longer significant on any of the dimensions of mental health. This research suggests that the poor mental health observed in alexithymic individuals may be largely accounted for by their ER difficulties. In addition, the results from a principal components analysis in this study suggested that the two constructs are largely independent with minimal overlap, leading the authors to speculate that alexithymia and ER difficulties may be interdependent. That is, difficulties with identifying and describing emotions may contribute to poor ER ability (Pandey et al., 2011). Other research has shown that although difficulties identifying and describing emotions is strongly associated with difficulties in regulating emotions, this relationship is mediated by one’s unwillingness to tolerate negative private experiences (Venta et al., 2013). Similarly, the relationship between alexithymia and symptomatology has been found to be mediated by EA (Panayiotou et al., 2015).

**Empirical research on alexithymia & psychopathology.**

Alexithymia has been investigated in a range of physical and mental health problems, with research tending to show that the construct is associated with statistically significant adverse effects (for a brief epidemiological review, see Masayo,
Furthermore, research suggests that alexithymia is associated with a higher vulnerability to mental illness (Leweke, Leichsenring, Kruse, & Hermes, 2011). For example, in a sample of 1461 outpatients diagnosed with depressive, anxiety, adjustment, somatoform, and eating disorders, the prevalence of alexithymia (assessed by cut-off scores on the TAS-20) was relatively high, with a significantly higher prevalence found in the depressive disorders group (Leweke et al., 2011). Alexithymia has been implicated in a range of psychiatric conditions such as autism (e.g., Bird & Cook, 2013; Griffin, Lombardo, & Auyeung, 2015), schizophrenia (for a meta-analysis, see O'Driscoll et al., 2014), eating disorders (for a review, see Nowakowski, McFarlane, & Cassin, 2013), panic disorder, OCD, and PTSD (for a review, see De Berardis et al., 2008), borderline personality traits and disorder (e.g., Deborde et al., 2012; D. Webb & McMurran, 2008), psychosomatic symptoms (e.g., De Gucht & Heiser, 2003; Panayiotou et al., 2015; Rief & Broadbent, 2007; G. J. Taylor, Parker, Bagby, & Acklin, 1992), self-harm behaviour (for a review, see Norman & Borrill, 2015), and disorders characterised by poor impulse control such as gambling (e.g., Parker, Wood, Bond, & Shaughnessy, 2005; Toneatto, Leece, & Bagby, 2009), substance abuse (e.g., Kauhanen, Julknen, & Salonen, 1992; for a review, see Thorberg, Young, Sullivan, & Lyvers, 2009; Troisi, Pasini, Saracco, & Spalletta, 1997), and compulsive buying (e.g., Rose & Segrist, 2012).

More specifically, higher levels of difficulties identifying and describing feelings have been positively associated with mental health problems such as depression, anxiety, insomnia, somatic complaints, social dysfunction, and negative affect, and negatively associated with life satisfaction and positive affect (P. Saxena, Dubey, & Pandey, 2011). With regard to anxiety and mood disorders, research has found that patients with GAD, MDD, and panic disorder score significantly higher than non-clinical controls on the TAS-20 total score and the difficulty identifying feelings and difficulty describing feelings subscales (Onur et al., 2013). A review by De Berardis et al. (2008) found that the difficulty identifying feelings and difficulty describing feelings dimensions appeared to be more relevant to panic disorder, PTSD, social phobia, and GAD, while the externally-oriented thinking dimension may be more relevant to OCD. In contrast, a recent study on an analogue OCD sample (Stern et al., 2014), found that poor understanding, as measured by the difficulty identifying feelings and difficulty describing feelings dimensions of the TAS-20, was significantly and
positively associated with all OCD symptom dimensions (i.e., washing, checking, doubting, ordering, obsessions, hoarding, neutralising). However, a recent review of the TAS-20 in OCD samples found that while OCD groups have higher levels of alexithymia compared to non-clinical groups, they do not have higher levels of alexithymia compared to other clinical groups (L. J. Robinson & Freeston, 2014). In a related obsessive-compulsive disorder, alexithymia is positively associated with trichotillomania, with the difficulty identifying feelings dimension and depression being significant predictors of symptom severity in a diagnosed sample (Rufer et al., 2014). In light of these findings, the authors suggested that individuals who have deficits in identifying their feelings may experience a diffuse negative arousal or inner tension without the ability to recognise and distinguish the associated feelings, and that hair pulling behaviour may represent a maladaptive way of reducing such negative arousal (Rufer et al., 2014).

While longitudinal research tends to suggest that alexithymia is a personality trait that remains stable over time (e.g., Chahraoui, Duchene, Rollot, Bonin, & Moreau, 2014; Honkalampi et al., 2001; Martínez-Sánchez, Ato-García, Córcoles Adam, Huedo Medina, & Selva España, 1998; Martínez-Sánchez, Ato-García, & Ortiz-Soria, 2003; Rufer et al., 2004; Todarello, Porcelli, Grilletti, & Bellomo, 2005), other research suggests that it is both a relatively stable trait and a state-dependent phenomenon which can change over time (de Haan et al., 2012; de Haan, van der Palen, Wijdeveld, Buitelaar, & De Jong, 2014; Honkalampi et al., 2001; Saarijärvi, Salminen, & Toikka, 2006). For example, in a 12-month follow-up study, mean TAS-20 scores were similar in each of the separate study phases, suggesting that alexithymia is a stable personality trait, however, at the individual level, alexithymia status had changed over that period in parallel with depression scores (Honkalampi et al., 2001).

There has been some debate about whether individuals high in alexithymia respond well to psychological interventions, with some suggesting that individuals with alexithymia may be less responsive to psychotherapy than those without alexithymia (Rufer et al., 2010). Unsurprisingly, treatment with alexithymic individuals can be difficult as the individual’s inability to identify and express emotions can interfere with assessment, diagnosis and treatment, and may impede the therapeutic relationship (Vanheule, Verhaeghe, & Desmet, 2011). However, there are some inconsistent findings in the literature regarding treatment outcome (see Ruth & Padmakumari, 2014).
For example, while alexithymia does not predict treatment response to multimodal CBT for OCD individuals (Rufer et al., 2004) or attrition and level of alcohol consumption after a 12-week CBT program for alcohol dependence (Stasiewicz et al., 2012), baseline alexithymia has been found to be a significant predictor of treatment outcome in patients with functional gastrointestinal disorders, with unimproved patients being higher on alexithymia (Porcelli et al., 2003). One prospective study over 3 years found that the difficulty identifying feelings dimension of alexithymia was a negative prognostic factor in the long-term outcomes of individuals with eating disorders (Speranza, Loas, Wallier, & Corcos, 2007).

A recent review suggests that alexithymia is partly modifiable with psychological interventions, with more significant reductions being found for treatments directly targeting alexithymic symptoms (see Cameron, Ogrodniczuk, & Hadjipavlou, 2014). For example, inpatients high in alexithymia who underwent psychodynamic group therapy during their admission had significant reductions in their psychological symptoms and alexithymia features after discharge, although they still exhibited higher psychological distress compared to non-alexithymic patients after discharge (Grabe et al., 2008). Several case study experiments aimed at specifically addressing alexithymia have also demonstrated reductions in alexithymic tendencies (Kennedy & Franklin, 2002; Vanheule et al., 2011). For example, Kennedy and Franklin (2002) delivered a skills-based intervention for alexithymia to three participants with anxiety-related disorders, which was successful in reducing alexithymia and helping them to clarify, identify, and describe their feelings. Furthermore, after treatment the participants were more attentive to their emotional states and less ambivalent about expressing emotions, and these gains were generally maintained for two of the three cases at 1-year follow-up (Kennedy & Franklin, 2002). While other research also suggests that alexithymia can be modified by psychotherapeutic interventions (Beresnevaité, 2000; Ogrodniczuk, Joyce, & Piper, 2013; Rufer et al., 2010), there is some debate about whether changes in alexithymia levels from pre- to post-treatment are a by-product of changes in depression or anxiety. For example, some researchers have found that reductions in alexithymia levels after treatment were associated with reductions in anxiety (Fukunishi, Kikuchi, Wogan, & Takubo, 1997) or became non-significant after controlling for changes in psychological stress and depression (Stingl et al., 2008). In contrast, a review by Nowakowski et al. (2013) found that pre- to post-treatment decreases in alexithymia
scores in individuals with eating disorders are evident even when depression levels remain stable, suggesting that the observed improvements in alexithymia are not simply a result of improved depression (de Groot, Rodin, & Olmstead, 1995; Nowakowski et al., 2013).

**Summary.**

In summary, alexithymia is a construct assessing difficulties with identifying and describing emotions, along with an externally-oriented thinking style, and can be considered a form of emotion dysregulation as it impacts on an individual’s ability to effectively regulate emotions. Despite its association with other ER measures, alexithymia appears to be a distinct construct. Empirical research suggests that alexithymia is associated with negative outcomes in clinical and non-clinical populations, is implicated in many psychiatric disorders, and appears to be somewhat amenable to treatment.

**Impulsivity.**

Conceptualised as a multifaceted trait, impulsivity is a key psychological construct evident across most theories of personality, thought to be characterised by concepts such as novelty seeking, sensation seeking, low inhibitory control, risk-taking, and reward sensitivity (e.g., Buss & Plomin, 1975; Cloninger, Przybeck, & Svrakic, 1991; Costa & McCrae, 1995; Eysenck & Eysenck, 1985; Tellegen, 1982; Zuckerman, 1994). Given the wide variety of personality theories regarding impulsivity and instruments purported to measure impulsivity, there has been confusion and disorganisation in the literature, and problems with integrating findings into a cohesive model of impulsivity (Berg, Latzman, Bliwise, & Lilienfeld, 2015; Whiteside & Lynam, 2001). In an attempt to address this confusion, Whiteside and Lynam (2001) examined extant measures and models of impulsivity and personality, with the aim of identifying and extracting the common facets across these measures into an inclusive model of the impulsivity construct. In doing so, they established that there are distinct facets of personality that lead to impulsive behaviour.

The first facet, urgency, refers to the tendency to engage in impulsive behaviours when experiencing negative emotions. Due to a tendency to experience strong impulses under conditions of negative affect, individuals high on urgency are likely to engage in impulsive behaviours to alleviate negative emotions, despite the harmful consequences
of such actions (Whiteside & Lynam, 2001). The (lack of) premeditation facet refers to the ability to think through the potential consequences of behaviour before acting. Individuals scoring low on this facet are thoughtful and considered, while high scorers act on the spur of the moment and have little regard for the potential consequences (Whiteside & Lynam, 2001). The (lack of) perseverance facet refers to the (in)ability to maintain vigilant attention on a task despite boredom, fatigue, or difficulty. Low scorers are able to resist distracting stimuli and complete projects, while high scorers find it difficult to make themselves do what they want or know they need to do (Whiteside & Lynam, 2001). Sensation seeking refers to preference for stimulation and excitement and openness to trying new experiences, which may or may not be dangerous. Low scorers on this facet avoid risk and danger, while individuals high on sensation seeking enjoy taking risks and participating in dangerous activities (Whiteside & Lynam, 2001).

Scales to measure each impulsivity facet were developed and combined to form the UPPS Impulsive Behaviour scale (UPPS; Whiteside & Lynam, 2001). Support for the initial four-factor model was established, with each factor loading onto relevant facets of the NEO Personality Inventory – Revised (NEO-PI-R; Costa & McCrae, 1995) – urgency loaded onto a factor containing the six facets of neuroticism; lack of premeditation and lack of perseverance loaded negatively onto a factor that included facets of conscientiousness; and sensation seeking loaded onto NEO-PI-R facets of extraversion (Whiteside & Lynam, 2001). The UPPS was later extended to include the Positive Urgency Measure (PUM; Cyders et al., 2007) to reflect the facet of positive urgency and was renamed the UPPS-P (Lynam, Smith, Cyders, Fischer, & Whiteside, 2007), with the original facet of urgency being labelled negative urgency. Positive urgency refers to the tendency to act rashly when experiencing high positive affect or a capacity for risk-taking behaviour in response to positive moods (Cyders et al., 2007).

Using confirmatory factor analysis on the five personality pathways to impulsive behaviour across both questionnaire and interview assessment methods, Cyders and Smith (2007) found support for a 3-factor understanding of dispositions to rash action: a) a general deficits-in-conscientiousness disposition to rash action, comprised of the two facets of a lack of perseverance and premeditation; b) a sensation seeking disposition to rash action; and c) a mood-based disposition to rash action, comprised of the facets of negative and positive urgency. This mood-based disposition to rash action, labelled as a broad ‘urgency’ factor, reflects an underlying dysregulation in response to
intense mood states (Cyders & Smith, 2007). Given this conceptualisation, it is apparent how this aspect of impulsivity relates to ER. That is, the notion of emotion-based impulsivity is relevant to ER given that strong emotions can elicit immediate actions designed to modulate those emotions, and these actions are likely to be maladaptive and inconsistent with long-term goals (Cyders & Smith, 2007). Indeed, research suggests that engaging in impulsive behaviours can represent an ER strategy that is often maladaptive (e.g., Verdejo-García, Bechara, Recknor, & Pérez-García, 2007; Whiteside & Lynam, 2001), which is inconsistent with a central component of adaptive ER – i.e., the ability to restrain impulsive or inappropriate behaviour when experiencing negative emotions and free up resources so that one can act in accordance with one’s goals (Linehan, 1993; Werner & Gross, 2010). As such, individuals high on negative and positive urgency appear to be characterised by underlying emotion dysregulation.

In a broader framework of self-regulation and self-control, optimal self-regulation involves staying focused on long-term goals in the presence of emotional distress which tends to direct attention to the immediate present (Tice & Bratslavsky, 2000). Grappling with one’s own feelings is thought to deplete coping resources and subsequently result in diminished self-control which can lead to an increased risk of disinhibited or impulsive behaviour (Baumeister, Muraven, & Tice, 2000). Furthermore, individuals who are experiencing acute emotional distress are likely to choose to escape such feelings by engaging in activities that provide immediate pleasure (Tice, Bratslavsky, & Baumeister, 2001).

Indeed, Cyders and Smith (2008b) describe a theory of urgency, highlighting that the experience of intense emotion impacts on rational decision-making and interferes with one’s focus on long-term goals, which can lead to engaging in ill-considered acts. The authors suggest that as high emotionality seems to be associated with a greater propensity for engaging in such acts, the regular experience of heightened emotionality may increase an individual’s risk for more frequently engaging in these acts, and these behaviours tend to be reinforced even if they are contradictory to an individual’s long-term interests (Cyders & Smith, 2008b). The authors discuss potential pathways for the development of urgency traits, highlighting that conducive conditions exist at the temperament, neurogenetic, neurotransmitter, and brain system levels (for a detailed discussion, see Cyders & Smith, 2008b).
Cyders and Smith (2008b) maintain that negative and positive urgency are of particular interest in the impulsivity domain, given that they uniquely pertain to the impact of emotion on rash action. Research suggests that these two traits are distinct from the other three traits, that they account for different features of risky behaviour than do the other traits, and that the two facets of urgency have different concurrent and prospective correlates (for a review, see Cyders & Smith, 2008b). For example, the two urgency facets are structurally and predictively separate from sensation seeking. While sensation seeking increases risk of frequently engaging in risky behaviours, the urgency facets increase risk for problematic levels of engagement in such behaviours (Cyders & Smith, 2007; Cyders et al., 2007; Fischer, Anderson, & Smith, 2004; G. T. Smith et al., 2007).

**Overlap with and distinction from other ER constructs.**

With regard to Gross' (1998b) model, impulse control difficulties most likely represent a form of ER failure. For example, individuals high in impulsivity may have dysfunctional ER goals given their inability to consider long-term consequences and to effectively inhibit rash action under positive and negative emotional states. Similarly, individuals high in impulsivity are likely to fail to place adequate value on the need for regulation (Gross, 2015a). With regard to ER strategies, impulsivity is evident in the use of maladaptive behavioural strategies such as self-harm and substance abuse that are implicated in the regulation of negative and positive emotions (Linehan, 1993). Furthermore, negative urgency and lack of perseverance have been associated with counterproductive thought-control strategies (R. E. Schmidt, Gay, Ghisletta, & Van der Linden, 2010), and research has found that trauma-exposed individuals with a strong tendency toward urgency use fewer appropriate cognitive ER strategies than do other individuals (Ceschi, Billieux, Hearn, Furst, & Van der Linden, 2014).

With regard to the multidimensional model of emotion dysregulation (Gratz & Roemer, 2004), there is clearly conceptual overlap between negative urgency (Lynam et al., 2007) and the DERS impulse control difficulties facet, as all items on that facet refer to difficulties controlling impulses when feeling upset. Indeed, research has demonstrated an association between impulsivity and emotion dysregulation. For example, in a sample of young adults, individuals high on emotion dysregulation, as measured by the DERS, scored significantly higher on self-report measures of impulsivity than did those low on emotion dysregulation (Schreiber, Grant, & Odlaug,
Likewise, the DERS total is strongly positively associated with negative urgency and moderately positively correlated with positive urgency (Pivarunas & Conner, 2015). Despite this conceptual overlap, research suggests that impulsivity and emotion dysregulation are distinct constructs. For example, impulsivity has also been found to contribute additional unique variance in the prediction of passive-aggressive, sadistic, and masochistic personality traits beyond the role of emotion dysregulation, suggesting that the DERS only partially overlaps with measures of impulsivity (Velotti & Garofalo, 2015). Likewise, research shows that emotion dysregulation, as measured by the impulse control difficulties, limited access to effective ER strategies, and lack of emotional clarity facets of the DERS, was significantly related to BPD features in two non-clinical adolescent samples. However, impulsivity accounted for a significant amount of additional variance in BPD features above and beyond emotion dysregulation (Fossati et al., 2013). Furthermore, research suggests that impulse control difficulties mediate the relationship between emotion dysregulation and behavioural outcomes. For example, in a clinical sample, Garofalo and Velotti (2015) found that impulsivity partially mediates the relationship between emotion dysregulation and alcohol misuse.

Impulse control difficulties are also associated with constructs such as DT and EA. According to Tice et al. (2001), when individuals are upset they wish to feel better, and this wish is often urgent. As such, emotional distress works against the usual pattern of impulse control which requires a long-term focus. Individuals give short-term ER priority over other self-regulatory goals which often manifests as indulging in immediate impulses to make themselves feel better (Tice et al., 2001). Individuals who have trouble tolerating emotional distress are therefore more prone to impulsive behaviour. Indeed, a low capacity for tolerating distress is thought to contribute to problems with ER as manifested by the increased use of impulsive behaviours to relieve distress (Linehan, 1993). Research has demonstrated that distress intolerance is associated with the UPPS-P, and with the specific facets of negative urgency and lack of perseverance (Anestis, Selby, Fink, & Joiner, 2007; Kelly, Cotter, & Mazzeo, 2014; Phung et al., 2015; A. D. Williams, 2012). Low levels of DT have been found to interact with high levels of urgency to predict bulimic symptoms, even after controlling for gender, measures of anxiety and depression, and other impulse control difficulties and theoretically relevant eating symptoms (Anestis et al., 2007). Research has also found negative urgency to mediate the relationship between DT and borderline
personality symptoms (Gaher et al., 2013), and total UPPS-P scores to partially mediate the relationship between DT and compulsive buying (A. D. Williams, 2012). Collectively, these findings suggest that DT and impulsivity are related, although separate constructs.

In line with the ability to accept and experience unpleasant internal events despite their intensity, is the ability to forgo immediate urges to reduce painful feelings, to control impulses to escape or avoid such feelings, and to engage in goal-directed behaviour (Linehan, 1993). Individuals who are unwilling to experience difficult emotions (i.e., those high in EA) are often unable to control their impulses to escape negative thoughts, sensations, emotions, or situations, and are unable to take action in their service of valued goals due to their preoccupation with avoiding these difficult internal experiences (Kashdan et al., 2006). Research has demonstrated associations between EA and self-reported impulsiveness (Berghoff, Pomerantz, Pettibone, Segrist, & Bedwell, 2012), with a strong positive correlation found between the AAQ and UPPS-P (A. D. Williams, 2012).

Impulse control difficulties might also be associated with alexithymia in that both constructs are related to neuroticism (Bagby, Taylor, & Parker, 1994; Whiteside & Lynam, 2001) and require the use of reflective and sophisticated cognitive processes in order to effectively regulate emotions and behaviours (Cyders & Smith, 2008b; Lane & Schwartz, 1987). Theoretically, deficits in the ability to identify and describe emotions may lead to impulsive action as the experience of undifferentiated negative arousal may invoke impulsive efforts to modulate this arousal, succinctly described by Shishido, Gaher, and Simons (2013) as ‘I don’t know how I feel, therefore I act’. Indeed, research demonstrates that alexithymia is positively associated with both positive and negative urgency (Fink, Anestis, Selby, & Joiner, 2010; Gaher et al., 2013; Shishido et al., 2013). Furthermore, alexithymia demonstrates distinct relationships with positive urgency and negative urgency in the prediction of problematic behaviour (Shishido et al., 2013). That is, positive urgency has been found to mediate the relationship between alexithymia and alcohol consumption, while negative urgency mediates the association between alexithymia and alcohol-related problems. Such research suggests that the inability to identify and describe feelings contributes to behavioural disinhibition under conditions of emotional arousal (Shishido et al., 2013). While lack of premeditation has been shown to partially mediate the relationship between alexithymia and maladaptive
behaviours, negative urgency fully mediates this relationship (Fink et al., 2010). Furthermore, given that mediation did not occur when using alexithymia as a mediator between negative urgency and maladaptive behaviours, this provides support for the theoretical roles these constructs play in influencing dysregulated behaviour (Fink et al., 2010). Similarly, research has found that negative urgency fully mediates the relationship between negative emotion differentiation and alcohol problems, suggesting that poor differentiation of negative emotions may promote impulsive behaviour via disinhibited behaviour under conditions of negative arousal (Emery, Simons, Clarke, & Gaher, 2014).

Collectively, the research outlined in the previous section suggests that while there appears to be some conceptual and statistical overlap between impulsivity and other ER constructs such as emotion dysregulation, EA, and alexithymia, these constructs appear to measure distinct but interrelated concepts.

**Empirical research on impulsivity & psychopathology.**

Research has demonstrated that impulsivity, as measured by the UPPS or the UPPS-P, is associated with a range of psychiatric disorders and behavioural problems, such as alcohol and drug use (e.g., Albein-Urios, Martinez-González, Lozano, Clark, & Verdejo-García, 2012; Shishido et al., 2013; Verdejo-García et al., 2007; Whiteside, Lynam, Miller, & Reynolds, 2005; Yarığç, Ersoy, & Oflaz, 2011), problem gambling (e.g., Albein-Urios et al., 2012; Blain, Gill, & Teese, 2015; Cyders & Smith, 2008a; Whiteside et al., 2005), ADHD (e.g., Lopez, Dauvilliers, Jaussent, Billieux, & Bayard, 2015; D. J. Miller, Derefinko, Lynam, Millich, & Fillmore, 2010; Mitchell, Robertson, Anastopulous, Nelson-Gray, & Kollins, 2012), bipolar disorder (e.g., Bøen et al., 2015; Victor, Johnson, & Gotlib, 2011), BPD (Bøen et al., 2015; Jacob et al., 2010; Whiteside et al., 2005), suicidality and self-injury behaviour (e.g., Dir, Karyadi, & Cyders, 2013; Glenn & Klonsky, 2010; Lynam, Miller, Miller, Bornovalova, & Lejuez, 2011), violent behaviour (e.g., Bousardt, Hoogendoorn, Noorhoorn, Hummelen, & Nijman, 2015; Derefinko, Dewall, Metze, Walsh, & Lynam, 2011; Mouilso, Calhoun, & Rosenbloom, 2013), PTSD (e.g., Contractor, Armour, Forbes, & Elhai, 2015; Weiss et al., 2013; Weiss, Tull, Sullivan, Dixon-Gordon, & Gratz, 2015), eating disorders (e.g., Claes, Vandereycken, & Vertommen, 2005; Kelly et al., 2014; Mobbs, Crépin, Thiéry, Golay, & Van der Linden, 2010; Peterson & Fischer, 2012), obsessive-compulsive symptoms (e.g., Cougle, Timpano, & Goetz, 2012; Zermatten & Van der Linden, 2008), and
symptoms of anxiety and depression (e.g., Cougle et al., 2012; J. Miller, Flory, Lynam, & Leukefeld, 2003; Tragesser & Robinson, 2009).

To illustrate, in a recent study of 200 Australian adult gamblers (Blain et al., 2015), facets of negative urgency, positive urgency, and sensation seeking were found to be positively associated with problem gambling, whereas lack of perseverance and lack of premeditation were not significantly correlated with gambling. Furthermore, positive and negative urgency were the only facets of the UPPS-P that significantly predicted problem gambling (Blain et al., 2015). Other research has found impulsivity to differentiate perpetrators of sexual aggression from non-perpetrators, with perpetrators scoring significantly higher on facets of negative urgency, positive urgency, and lack of premeditation (Mouilso et al., 2013). Likewise, Derefinko et al. (2011) found that different facets of impulsivity predict different forms of aggression. While lack of premeditation and sensation seeking predicted general violence, urgency (i.e., positive and negative urgency subscales combined) was most important in predicting intimate partner violence. Furthermore, autonomic responsivity to pleasant and aversive stimuli was associated with, and predicted significant variance in, intimate partner violence. However, urgency was found to be a unique significant predictor of intimate partner violence above and beyond measures of autonomic arousal and neuroticism (Derefinko et al., 2011).

In particular, negative urgency appears to be a predominant factor in psychopathology. A recent meta-analytic review, comprised of 115 studies that assessed impulsivity via the UPPS or UPPS-P in over a total of 40,000 participants, revealed that negative urgency exhibited the largest effect size across all forms of psychopathology (Berg et al., 2015). Compared to the other UPPS subscales, negative urgency demonstrated the largest effect size for depression, anxiety, obsessive-compulsive symptoms, disordered eating, and BPD and emotion dysregulation. The main exception to the pattern of negative urgency being the predominant facet in impulsive behaviour is in the case of ADHD, which was most highly associated with lack of perseverance, followed by negative urgency, and lack of premeditation. In addition, negative urgency did not differ significantly from lack of premeditation and sensation seeking with regard to suicidality and self-harm behaviour. This review found that positive and negative urgency demonstrated a similar effect size for alcohol and substance use, although further analyses with regard to positive urgency and other forms of psychopathology
were precluded by a lack of studies utilising the positive urgency subscale (Berg et al., 2015).

This meta-analytic review suggests that negative urgency is the impulsivity dimension most strongly implicated in the development of impulsive behaviour and in accounting for a broad range of psychological symptoms (Berg et al., 2015). As such, the main feature in many forms of impulsivity-based psychopathologies is a difficulty regulating one’s response to intense negative emotions, rather than a failure to adequately plan one’s actions and consider consequences. Given the affective component of negative and positive urgency and their strong associations with a wide range of psychopathology, it appears that emotion is a key contributor to many impulsive behaviours, or that a deficit in ER skills underlies many impulsive behaviours (Berg et al., 2015). Some of the studies reviewed demonstrated that negative urgency contributed additional variance to impulsive behaviour that is not accounted for by negative affect or low DT alone, with the authors speculating that positive urgency will also be predictive of psychopathology after accounting for high affect and low DT (Berg et al., 2015). Despite evidence for five distinct factors of the UPPS-P, Berg et al. (2015) questioned the conceptual and practical separability of these facets, given the similar correlational patterns found with negative urgency and positive urgency, and with a lack of premeditation and a lack of perseverance, and suggest further research is required on the differential pathways to psychopathology.

The role of impulsivity in the development, maintenance, and treatment of psychopathology has also been established. For example, positive urgency has been shown to predict longitudinal increases in gambling behaviour, while sensation seeking predicts longitudinal increases in general risky behaviours, such as mountain climbing, bungee jumping, and parachuting (Cyders & Smith, 2008a). Another prospective study found that lack of perseverance at baseline was significantly associated with binge-eating frequency at 8-month follow-up (Peterson & Fischer, 2012). In contrast, in a sample of over 1900 children, Pearson, Combs, Zapolski, and Smith (2012) found that levels of negative urgency in the final year of elementary school predicted subsequent increased levels of expectancies that eating helps to manage negative emotions, which in turn predicted subsequent increases in binge-eating behaviour at the end of the first year of high school, above and beyond prior levels of binge-eating behaviour.
Other research has investigated whether the relationship between some psychological variables and behavioural problems are due in some part to impulse control difficulties. For example, research has found that both negative and positive urgency mediate the relationship between anger and violent behaviour (Ammerman et al., 2015), and both facets mediate the relationship between lifetime PTSD symptoms and risky behaviours, such as substance use, risky sexual behaviour, excessive spending, binge eating or drinking, reckless driving, aggression and assault (Weiss, Tull, Sullivan, et al., 2015). Negative urgency has been found to mediate the relationship between self-control and affective lability on deliberate self-harm, eating problems, and problematic alcohol use (Dir et al., 2013).

Research on treatment outcomes suggests that treatment-induced changes in impulsivity are associated with positive outcomes. For example, Delgado-Rico et al. (2012) found that for a sample of overweight adolescents who participated in a 12-week multicomponent behavioural intervention comprised of CBT, structured physical activity, and dietary counselling, changes in impulsivity and cognitive skills predicted changes in body mass index. Specifically, greater decreases in participants’ levels of negative urgency and greater improvement in their cognitive inhibitory control skills were associated with greater decreases in their body mass indices (Delgado-Rico et al., 2012). Other research demonstrates that emotion modulation and impulsivity-reduction interventions are effective at reducing self-reported impulsivity (as measured by the UPPS-P) and impulsive behaviour over time (Weiss, Tull, Davis, et al., 2015; Weiss, Tull, & Gratz, 2014).

**Summary.**

In summary, impulsivity is a multifaceted construct relevant to ER. In particular, negative and positive urgency represent an emotion-based disposition toward impulsive action. Such impulsive actions reflect underlying difficulties with ER and represent maladaptive ER efforts. While there is conceptual similarity and associations within the UPPS-P impulsivity facets, and between the UPPS-P and other ER constructs (e.g., emotion dysregulation, alexithymia, distress intolerance, and EA), there is some evidence for their separability. Research suggests that negative and positive urgency in particular are associated with negative outcomes in clinical and non-clinical populations, are implicated in a wide range of psychiatric disorders, play a mediating
role between some psychological variables and behavioural outcomes, and may represent a mechanism of change in treatment outcomes.

Chapter Summary

The literature on ER is extensive, given a wide range of conceptualisations from various disciplines and a plethora of instruments and methods for measuring the construct. As such, the field is challenged by some conceptual ambiguity in the absence of a unified definition of the construct and given the diversity of emotion-related processes (Gross & Jazaieri, 2014). Indeed, there is a multitude of concepts that claim to measure ER, and the enthusiasm for the research area continues to surpass the issues surrounding conceptual clarity and valid assessment (see Berking & Wupperman, 2012; Gross, 2013; L. J. Robinson & Freeston, 2014). Within the field of psychology, ER appears to represent a transdiagnostic factor, and has been studied widely in relation to many forms of psychopathology through various measures and study designs. This chapter has provided an overview of two contemporary conceptualisations of ER (i.e., Gratz & Roemer, 2004; Gross, 1998b) and several related constructs (i.e., EA, alexithymia, and impulsivity). These constructs have been discussed in terms of overlap and distinctness, along with some of the empirical research in support of their role in the development, maintenance, and treatment of psychopathology.

In summary, the two models appear to differ with regard to the features of ER they deem as central, with Gross (1998b) placing more importance on the particular strategies individuals intentionally use to modulate their emotions, while Gratz and Roemer (2004) focus more on general ER competencies and ability to function when emotional. There is some conceptual similarity between EA and aspects of Gratz and Roemer’s (2004) model (e.g., non-acceptance of emotional responses and a lack of access to effective ER strategies). Likewise, alexithymia conceptually overlaps with the facets of a lack of emotional awareness and lack of emotional clarity, while negative urgency overlaps with the impulse control difficulties facet of the DERS (Gratz & Roemer, 2004). Furthermore, the constructs of EA, alexithymia, and impulsivity can be conceptualised under various aspects of the process model of ER (Gross, 1998b) and are theoretically associated with one another. However, there is some statistical evidence for their distinction, suggesting that these constructs are related but not completely overlapping.
Given that the TAS-20 (Bagby, Parker, et al., 1994) is the oldest construct of those discussed in this chapter, alexithymia has received the most amount of empirical support, while positive urgency is the latest facet of ER to be incorporated into a measure (Lynam et al., 2007) and has therefore received less investigation. However, given the amount of research conducted with all of these ER constructs in relation to various forms of psychopathology, there does not appear to be a basis for considering some constructs as superior to others. Although the multidimensional model (Gratz & Roemer, 2004) may be a more comprehensive construct assessing multiple dimensions of ER rather than one dimension (e.g. EA), there is some debate in the literature about the dimensionality of the DERS. It is likely that some aspects of ER might be more relevant to particular disorders than others, and as such, the inclusion of multiple measures of ER may reveal important differential associations with features of psychopathology.

To that end, the current research project aimed to investigate the role of various aspects of ER (i.e., ER difficulties, negative and positive urgency, alexithymia, EA, and the use of reappraisal and suppression strategies) in relation to hoarding, in order to better understand the function of specific hoarding symptoms. Additionally, this project aimed to examine an important component of the CBT model of hoarding (i.e., beliefs about possessions) in the ER-hoarding relationship. In consideration of the importance of both general ER competence and the strategies individuals intentionally use to regulate their emotions, the current research project also aimed to explore how individuals with hoarding difficulties experience and attempt to regulate their emotions. The following chapter provides an overview of the theoretical rationale for investigating the role of ER in relation to HD, followed by a literature review of the empirical research conducted, to date, on ER constructs and hoarding.
Chapter 4: Emotion Regulation and Hoarding

At the inception of the current research project, there were only a few studies that had investigated ER constructs in relation to hoarding. Since that time, this area of research interest has progressed significantly. This chapter begins with an overview of the theoretical rationale for examining ER constructs in relation to HD, firstly by applying an emotion dysregulation framework to the phenomenology and CBT model of HD, and then by applying the two main models of ER discussed in Chapter 3 (i.e., Gratz & Roemer, 2004; Gross, 1998b) to specific features of the disorder. Subsequently, a literature review of the research conducted, to date, on ER constructs and hoarding is provided.

Theoretical Rationale for Research Area

**Conceptualising the phenomenology and cognitive-behavioural model of hoarding in an emotion dysregulation framework.**

There are several lines of reasoning underlying why an emotion dysregulation framework might be applicable to the understanding and treatment of HD. With regard to vulnerability factors for the disorder, HD is highly comorbid with MDD and GAD (Frost, Steketee, et al., 2011), and both of these disorders are characterised by ER difficulties. Specifically, research has demonstrated that compared to community controls, individuals with GAD experience significantly greater difficulty identifying and describing emotions, less clarity of their emotions, greater fear of the perceived negative consequences of anxiety, depression, anger, and positive emotions, and less ability to recover from a negative mood state (Mennin, Heimberg, Turk, & Fresco, 2005). Deficits in emotional clarity, the acceptance of emotions, the ability to engage in goal-directed behaviours when distressed, impulse control, and access to effective ER strategies have also been found to be correlated with analogue GAD and worry even after controlling for measures of general negative distress (Salters-Pedneault et al., 2006). Likewise, research has found that depressed individuals report less understanding and clarity of their emotions (Rude & McCarthy, 2003), greater negative reactivity to emotions (Mennin et al., 2007), more frequent use of ER strategies such as suppression and rumination, and less frequent use of reappraisal (D'Avanzato et al., 2013; Ehring, Fischer, Schnulle, Bosterling, & Tuschen-Caffier, 2008; Rude &
McCarthy, 2003). Given the high comorbidity rate between HD and these disorders, it is reasonable to assume that ER difficulties may also be implicated in HD.

Information processing deficits represent another vulnerability factor for hoarding, and neuropsychological research suggests that individuals with HD exhibit dysfunction in the neural systems that mediate impulse control and ER (for reviews, see Grisham & Baldwin, 2015; S. Saxena, 2008). In addition, negative early developmental experiences are considered to be another vulnerability factor for HD, as research demonstrates a link between hoarding and negative early experiences such as trauma, lack of warmth in family of origin, and emotional and material deprivation (for a detailed review, see Kyrios, 2014). It is unsurprising that individuals who have experienced such negative early life experiences may have difficulty with understanding and regulating their emotions, and may have developed maladaptive strategies to cope with such experiences. By their nature, negative early developmental experiences are likely to both elicit strong emotional experiences and influence one’s ability to understand and manage such experiences. Indeed, impaired affect development during early childhood has been implicated in the underlying deficits of alexithymia (G. J. Taylor et al., 1997). In the face of strong emotions and the absence of effective ER skills, individuals may attempt to cope through whatever means are available to them, perhaps by relying on possessions as a way of managing and soothing emotions. Indeed, research postulates that negative early experiences might shape an individual’s perception of and attachment to possessions, in that possessions provide them a sense of safety and security (see Kyrios, 2014). As such, ER difficulties may be implicated in the formation of strong attachments to possessions.

The CBT model of hoarding highlights the role of maladaptive beliefs regarding the emotional reasons for saving possessions (Steketee et al., 2003), which may be conceptualised through an ER framework. Research indicates that compared to non-hoarding individuals, those with HD report extreme levels of emotional attachment to items and a greater degree of saving for sentimental reasons (Frost & Gross, 1993; Frost & Hartl, 1996; Frost et al., 1995). Underlying sentimental reasons for saving is the fear of losing important possessions, the fear that parting with a possession signifies the loss of part of the identity, and the feelings of comfort and safety provided by possessions (Steketee et al., 2003). Indeed, individuals with HD have described objects as “removed from emotional life” and “soothing”, and have spoken of a sense of security and
comfort derived from “gathering treasures” and building “fortresses” with their possessions around themselves (Frost & Steketee, 2010). Similarly, the tendency to anthropomorphise is indicative of strong emotional attachments (Frost et al., 1995; Frost et al., 2012; Timpano & Shaw, 2013), and may suggest that possessions serve an emotionally supportive function. As such, the strong attachment to possessions evident in HD may represent underlying ER difficulties, and the reliance on possessions as a form of ER may reinforce and strengthen attachment beliefs over time.

The facet of the CBT model of hoarding pertaining to emotional reactions associated with acquiring (Frost & Hartl, 1996; Steketee & Frost, 2003, 2014b) is also consistent with an ER model. For example, research suggests that compulsive buying, a phenomenon closely aligned with excessive acquisition, is associated with motivations to change one’s mood state or arousal level (Faber & Christenson, 1996). Indeed, acquiring has been conceptualised as a maladaptive attempt to regulate one’s positive and negative emotions (Tolin, 2011). As such, individuals with HD may engage in acquiring behaviour as a way of regulating emotional distress such as loneliness or depression, or alternatively, because they have difficulty with regulating impulses under conditions of positive affect.

Indeed, there are several lines of research suggesting that hoarding behaviour might be associated with impulse control difficulties. Firstly, hoarding behaviour is likely to be associated with impulse control difficulties given that it has been linked to impulse control behaviours such as compulsive buying, skin picking, trichotillomania, and nail biting (Frost, Steketee, et al., 2011; Mueller et al., 2009; Samuels et al., 2002). One study found that approximately 60% of HD participants experienced both compulsive buying and the acquisition of free things, and almost 10% also experienced problems with kleptomania (Frost, Steketee, et al., 2011). Secondly, individuals with behavioural addictions and ICDs experience emotional states such as pleasure or gratification when engaging in the target behaviour, followed by a decrease in arousal and subsequent negative feelings such as guilt (Hollander & Allen, 2006). Similarly, individuals with hoarding difficulties report experiencing pleasure and gratification when engaging in acquiring behaviour, perhaps feeling a rush of positive emotion upon finding a unique item, pleasure or relief from saving behaviour, and regret or guilt when they reflect upon the negative impact of clutter in the home (Grisham, Williams, & Kadib, 2011; Steketee & Tolin, 2011). Also similar to ICDs, excessive acquisition is
most often perceived by individuals with hoarding as ego-syntonic and motivated by negative and positive emotional states (Frost, Steketee, et al., 2011; Mueller et al., 2009; Samuels et al., 2002; Steketee & Frost, 2003), which therefore might be indicative of failures in self-control, and more specifically, difficulties with controlling impulses and urges. Indeed, hoarding behaviour can be conceptualised using an addictions framework which views the behaviour as driven by the anticipation of pleasure (not just the reduction of anxiety) and by self-regulation deficits (see Grisham et al., 2011).

Similarly, ADHD is a disorder characterised by self-regulation deficits and impulsive features that is frequently comorbid with hoarding (Frost, Steketee, et al., 2011; Grisham et al., 2007; Hartl et al., 2005). The presence of emotion dysregulation in ADHD is well recognised (for reviews, see Bunford, Evans, & Wymbs, 2015; P. Shaw, Stringaris, Nigg, & Leibenluft, 2014), with research demonstrating moderate positive correlations between measures of retrospective ADHD symptoms, emotion dysregulation, and impulsivity (Fossati et al., 2015). While deficits in executive functioning have been suggested to partly explain the comorbidity between ADHD and HD (F. A. Lynch et al., 2015), ER difficulties may also be a shared feature of both disorders. Collectively, the shared features across ADHD, ICDs, and HD lends support to the notion that ER difficulties (i.e., with impulse control and self-regulation) may be implicated in the disorder, and may be evident particularly with acquiring behaviour.

Another feature of hoarding that is consistent with an ER conceptualisation pertains to the emotional reactions associated with discarding. The CBT model maintains that saving behaviours arise because the individual has difficulty tolerating and managing the distress or emotional experience that is evoked by discarding objects (Frost & Hartl, 1996; Steketee & Frost, 2003, 2014b). As such, saving is conceptualised as an avoidance behaviour, as it enables the individual to avoid the negative emotions (e.g., guilt, fear, grief) associated with discarding and decision-making about what to discard. Likewise, because sorting and categorising items can be overwhelming for individuals with HD, the behaviour is avoided, resulting in increased clutter and disorganisation, which maintains negative emotions (Frost & Hartl, 1996; Steketee & Frost, 2003, 2014b). It has also been suggested that strong negative emotions are experienced at the prospect of not acquiring an item, and that individuals with hoarding difficulties avoid these feelings by engaging in acquiring behaviour (Frost & Hartl, 1996). These features of strong emotional reactions and avoidance of distress are
consistent with a model of EA that includes both emotional and behavioural forms of avoidance, and may also reflect ER difficulties in the domain of acceptance of emotional responses. Furthermore, hoarding behaviours may in themselves represent direct maladaptive attempts to regulate emotion, or they may be the result of maladaptive beliefs that have developed from underlying ER deficits.

The preceding discussion reveals that certain aspects of the phenomenology of HD and the CBT model of hoarding behaviour can be conceptualised using an emotion regulatory framework. In summary, hoarding behaviours such as acquisition and saving behaviours appear, in some part, to represent ER efforts, difficulties with impulse control, EA, and/or non-acceptance of emotional responses. Furthermore, vulnerability factors may impact on basic emotional awareness and understanding, and influence the use of maladaptive ER strategies such as relying on possessions for emotion regulatory purposes (e.g., soothing). Such a conceptualisation is consistent with the accumulating research on the link between ER deficits and a range of psychopathologies (see Berking & Wupperman, 2012; Hu et al., 2014).

**Emotion regulation models applied to hoarding.**

According to the process model of ER, emotion dysregulation can result from either ER failure (i.e., not using strategies when it is helpful to do so) or emotion misregulation (i.e., using a form of ER that is not appropriate for the situation) (Gross & Jazaieri, 2014). In the case of hoarding, individuals may have difficulties tracking their emotional responses (perhaps due to attentional issues, lack of emotional awareness, or alexithymia), which could result in a failure to regulate emotions. However, even if tracking was not an issue, individuals with HD may inappropriately select a goal for regulation (e.g., they may fail to place value on the need to downregulate positive emotions in the context of acquiring). Even after an ER goal has been activated, perhaps individuals with HD select inappropriate strategies to regulate their emotions. For example, beliefs about emotions (e.g., as bad or immutable) and/or high emotional intensity may lead to the habitual use of avoidance-based strategies in contexts where this is problematic (e.g., sorting, organising, discarding). As the availability of cognitive resources required to implement a strategy is also a factor in effective ER (Gross & Jazaieri, 2014), the information processing deficits characteristic of the disorder may mean that individuals with HD do not typically use cognitive strategies such as
reappraisal for implementation. Similarly, as the intensity of distress influences strategy selection and implementation (Gross & Jazaieri, 2014), perhaps under conditions of high emotional intensity, strategies that are less cognitively demanding and achieve an immediate reduction in the experience of emotion (e.g., leaving the house) will be chosen by individuals with HD over more sophisticated strategies that modulate the intensity of emotion (e.g., cognitive reappraisal, mindful attention to feelings).

To illustrate more specifically with regard to the five families of ER processes (Gross, 1998b), an individual with HD may engage in problematic situation selection by avoiding the situation or task of sorting, organising, and discarding clutter as a way of avoiding the anxiety associated with these tasks. They may also engage in problematic situation selection when they choose to approach thrift stores and hard rubbish collections in order to increase the likelihood of experiencing positive emotions. The ‘churning’ through of items during sorting (Steketee & Frost, 2010) may represent a form of situation modification aimed at altering the emotional impact of the situation. Attentional deployment may be problematic when an individual with HD becomes absorbed in the sensory experience while shopping (Kellett & Bolton, 2009), is highly focused on the attributes of the desired object, and attends only to the perceived benefits of acquiring an item in an effort to elicit positive emotions. Individuals with HD may also focus attention away from the task of sorting, categorising, and discarding by utilising distraction strategies. Problematic cognitive change strategies in hoarding might involve maladaptive appraisals about the experience of emotions and the ability to manage emotions, given the strong avoidance of distress characteristic of the disorder. Furthermore, as individuals with HD have distorted appraisals about their possessions and the consequences of their behaviour, they are likely to have difficulty employing cognitive reappraisal strategies. After an emotion has been generated, individuals with HD may engage in problematic response modulation strategies such as emotion-driven behaviours such as shopping in an effort to regulate their emotional upset. Furthermore, given that individuals with HD often avoid having people in their homes and do not want to acknowledge the severity of their problems, they may use expressive suppression as a way of attempting to diminish feelings of shame and depression. Overall, it is theorised that individuals with HD are likely to use maladaptive strategies across the five ER processes, and that these strategies are largely
characterised by avoidance, have serious long-term costs that outweigh the short-term benefits, and reinforce the symptoms and severity of the disorder.

With respect to the multidimensional model of ER and dysregulation (Gratz & Roemer, 2004), the strong emotional reactions and avoidance of distress experienced by individuals with HD appear to be indicative of general emotion dysregulation, and more specifically, may reflect non-acceptance of emotions. Hoarding behaviours may also reflect limited access to other effective ER strategies. Given that effective ER involves the ability to modulate the intensity or duration of emotions (rather than eliminating emotions altogether), accepting (rather than controlling) emotional experience, and the flexible use of ER strategies in consideration of context (Gratz & Roemer, 2004), the habitual use of avoidance-based strategies by HD individuals appear to be indicative of ER difficulties. Furthermore, individuals with HD appear to have difficulties with modulating arousal to reduce the urgency associated with emotions and acting in accordance with desired goals, given features of the disorder that appear to be characterised by impulse control difficulties (e.g., compulsive acquiring) and difficulties concentrating and accomplishing tasks under conditions of negative affect (e.g., sorting, organising, discarding). As such, it is theorised that HD individuals experience difficulties in these domains, and that emotion dysregulation may be implicated in the development and/or maintenance of hoarding behaviours.

The preceding section outlined some of the potential ways in which two prominent ER models might be applicable to understanding specific features and symptoms of HD. In conjunction with the previous section which applied an emotion dysregulation framework to the phenomenology and CBT model of HD, there appears to be a sound theoretical rationale for investigating the role of ER in hoarding behaviour. In relation to empirical research conducted on the role of ER in hoarding behaviour, research findings have been inconsistent, most likely due to the various definitions and ways of measuring the ER construct. The following section discusses the research conducted to date in the area of ER and hoarding behaviour.

**Empirical Research on Emotion Regulation Constructs and Hoarding**

Empirical research on emotion regulation difficulties and hoarding.

There are only a few studies that have investigated ER difficulties as measured by the DERS (Gratz & Roemer, 2004) in relation to hoarding behaviour. In a closely
related phenomenon to the acquisition features of HD, A. D. Williams and Grisham (2012) found that greater levels of compulsive buying were significantly correlated with ER difficulties, specifically in the domains of non-acceptance of emotional responses, difficulties engaging in goal-directed behaviour, impulse control difficulties, limited access to effective ER strategies, and lack of emotional clarity. Lack of emotional awareness was not significantly associated with compulsive buying pathology. Results also demonstrated that after controlling for gambling pathology and general psychopathology, compulsive buyers \( (n = 49) \) scored significantly higher than healthy controls \( (n = 37) \) on all facets of the DERS except for difficulties engaging in goal-directed behaviour (A. D. Williams & Grisham, 2012).

In the first study to investigate ER difficulties in HD, Fernández de la Cruz et al. (2013) examined hoarding symptoms and the DERS (Gratz & Roemer, 2004) across four groups: HD individuals without comorbid OCD \( (n = 24) \), HD individuals with comorbid OCD \( (n = 19) \), OCD individuals without hoarding symptoms \( (n = 17) \), and non-clinical controls \( (n = 20) \). Results showed that individuals in the HD groups had higher levels of ER difficulties compared to healthy controls. However, individuals with HD and comorbid OCD obtained significantly higher scores on the DERS compared to individuals with HD alone, and individuals with OCD alone. With regard to facets of emotion dysregulation, results demonstrated that individuals with HD and comorbid OCD had significantly higher scores on the difficulty engaging in goal-directed behaviour and limited access to ER strategies subscales of the DERS, compared to HD individuals without comorbid OCD. Subsequent analyses with a combined hoarding group (i.e., HD with and without comorbid OCD) demonstrated that individuals with HD and individuals with OCD alone had significantly higher scores than healthy controls on several subscales of the DERS: non-acceptance of emotional responses, limited access to ER strategies, impulse control difficulties, and lack of emotional clarity. While all clinical participants had higher scores than healthy controls on the difficulty engaging in goal-directed behaviour subscale, individuals with HD and comorbid OCD scored significantly higher on this domain than either the HD alone and OCD alone participants. No group differences were found for the lack of emotional awareness subscale of the DERS, which is consistent with other research on facets of ER and anxiety disorders that suggests that this subscale may not differentiate between adaptive (e.g., accepting/allowing) and maladaptive (e.g., judgemental, self-focused, or
ruminative) forms of emotional attention and awareness (Fernández de la Cruz et al., 2013; Lischetzke & Eid, 2003; Salters-Pedneault et al., 2006; Tull et al., 2007).

Analyses on the whole clinical sample revealed that ER difficulties were not significantly correlated with three different measures of hoarding symptoms, suggesting that hoarding severity is not associated with greater difficulties in ER (Fernández de la Cruz et al., 2013). However, one facet of the DERS, the difficulty engaging in goal-directed behaviour subscale, was significantly correlated with all three measures of hoarding severity even after controlling for OCD severity. The authors suggested that this finding may be attributed to the overlap between the items on this subscale (which pertain to difficulty concentrating, focusing, and getting things done when upset) and the neuropsychological difficulties HD individuals experience in domains of attention, planning, and decision-making (Fernández de la Cruz et al., 2013). Overall, the findings of this study demonstrated that HD individuals (and particularly those with comorbid OCD), exhibit greater difficulty with ER compared to healthy controls. Given that ER difficulties were more prominent in the HD comorbid with OCD group than in either disorder alone, the authors suggested that this may indicate a cumulative effect. It must be noted that ER difficulties were moderately correlated with OCD symptoms in this study, but not significantly associated with hoarding symptoms. Nevertheless, despite the lack of specificity to HD, this authors note the potential value of incorporating interventions aimed at improving emotional tolerance and regulation in the treatment of HD (Fernández de la Cruz et al., 2013).

In a recent study, Raines, Boffa, Allan, Short, and Schmidt (2015) investigated the relationships between hoarding severity, obesity, binge-eating symptoms, and ER difficulties in a non-clinical sample of individuals (N = 97) who had scores at or above the clinical cut-off score on a measure of hoarding severity, the Saving Inventory Revised (SI-R; Frost et al., 2004). Results demonstrated that the DERS total score was significantly positively correlated with hoarding severity (i.e., SI-R total scores and acquisition subscale scores), and symptoms of binge-eating. Hoarding severity was found to be significantly predictive of increased BMI and eating concerns, even after controlling for overall levels of negative affect. Furthermore, the three facets of the SI-R (i.e., acquisition, difficulty discarding, and clutter) contributed additional variance in BMI and eating concerns (10% and 8% respectively) after controlling for overall levels of negative affect. As anticipated, the acquisition subscale was a significant predictor of
increased BMI and eating concerns, while the clutter subscale was not. The researchers noted that this finding is consistent with the idea that acquiring is a way of regulating both positive and negative emotions, and suggest that overeating might represent another maladaptive avenue through which HD individuals attempt to regulate their emotions. Contrary to expectations, the difficulty discarding subscale was not significantly predictive of increased BMI or eating concerns. The authors postulated that perhaps difficulty discarding represents an avoidance behaviour rather than an attempt at ER, given that saving enables the individual to avoid any distress associated with decision-making and discarding (Raines et al., 2015). Finally, the results revealed that ER difficulties mediated the relationship between hoarding severity and disordered eating symptoms, but not the relationship between hoarding symptoms and BMI. While the latter finding might be attributed to more complex relationships between genetic and psychological factors, the former result lends support to the link between emotion dysregulation and hoarding. Despite the cross-sectional nature of this study, the findings suggest that emotion dysregulation is an important transdiagnostic risk factor for both hoarding and eating disorders, which has implications for treatment interventions (Raines et al., 2015).

In summary, while ER difficulties may be more prominent in other disorders, there is some evidence to show that individuals with hoarding problems experience difficulties with ER. Further research is needed in this area, given that the only two studies to investigate ER difficulties in relation to hoarding behaviour have revealed inconsistent findings about the association between the DERS (Gratz & Roemer, 2004) and hoarding symptoms as measured by the SI-R (Frost et al., 2004). This inconsistency may be due to differences in the sample sizes and characteristics of the studies. For example, Fernández de la Cruz et al. (2013) had a smaller sample size and included clinical groups with a higher mean age and higher ratio of female to male participants compared to the sample in the study by Raines et al. (2015). However, the mean scores on the DERS and SI-R total were comparable across the two studies. Clarifying these inconsistencies further is impeded because Raines et al. (2015) did not report results for any of the subscales of the DERS, while Fernández de la Cruz et al. (2013) did not investigate the acquisition, clutter, and difficulty discarding subscales of the SI-R. As such, further research is needed in this area to elucidate the differential relationships between ER difficulties and hoarding symptom dimensions. Particular aspects of ER
may be related to specific hoarding symptoms or behaviours, highlighting the need for a more fine-grained analysis of the relationship between facets of ER and specific hoarding behaviours.

**Empirical research on experiential avoidance and hoarding.**

Several studies have investigated the role of EA in relation to hoarding and hoarding-related symptoms. For example, in a closely related behaviour to excessive acquisition, compulsive buying has been found to be associated with greater EA, with individuals in a compulsive buying group scoring significantly higher on EA compared to healthy controls (A. D. Williams, 2012). With regard to the prediction of hoarding symptoms, the research on EA has revealed mixed findings. In an initial study with an unscreened student sample ($N = 385$), Wheaton, Abramowitz, Franklin, Berman, and Fabricant (2011) investigated the role of EA, as measured by the 10-item version of the AAQ-II (Bond et al., 2011), and hoarding symptoms, as measured by the SI-R (Frost et al., 2004). Experiential avoidance was found to be significantly correlated with SI-R total scores and each of the three subscales (i.e., acquisition, clutter, difficulty discarding). Regression analyses revealed that EA predicted SI-R total scores over and above gender, symptoms of general distress, and saving cognitions. Furthermore, EA was found to be a significant individual predictor of the acquisition and clutter facets of hoarding after controlling for these covariates, but surprisingly, not the difficulty discarding facet. These results suggested that in a non-clinical sample, hoarding behaviours such as clutter and acquisition are associated with attempts to avoid internal experiences. However EA only accounted for a small amount of the variance (1%) with considerable variance remaining unaccounted for (Wheaton et al., 2011).

As an extension to this study, Wheaton, Fabricant, Berman, and Abramowitz (2013) examined hoarding symptoms and EA, as measured by the 7-item version of the AAQ-II (Bond et al., 2011), across three groups: individuals with HD ($n = 33$), individuals with an anxiety disorder ($n = 32$), and matched healthy controls ($n = 30$). Results demonstrated that the anxiety disorder group scored significantly higher on the AAQ-II compared to the HD group. While the HD group experienced higher levels of EA compared to healthy controls, this difference became non-significant after accounting for symptoms of depression, anxiety, and stress. Contrary to expectations, EA was not significantly associated with the hoarding symptoms for the HD group, and
did not make any unique contributions to variance in the regression models predicting hoarding symptoms. As such, the authors suggested that EA might be relevant for understanding general distress in individuals with HD, but not for conceptualising hoarding symptoms, which were found to be more strongly related to saving cognitions (Wheaton et al., 2013).

In addition to examining ER difficulties in relation to hoarding symptoms, the aforementioned study by Fernández de la Cruz et al. (2013) also investigated EA, as measured by the 10-item version of the AAQ-II (Bond et al., 2011). The results showed that HD individuals experienced significantly higher levels of EA compared to healthy controls, but not compared to OCD individuals. Experiential avoidance was significantly heightened when HD was comorbid with OCD than when HD occurred without comorbid OCD. In contrast to expectations, there was no significant association between measures of hoarding and EA across the entire clinical sample, suggesting that hoarding is not related to higher levels of EA. Rather, higher levels of EA were found to be moderately correlated with increased obsessive-compulsive symptoms. Based on these findings, the researchers concluded that EA is not specifically relevant to HD and appears to be more relevant to OCD, although EA more likely represents a transdiagnostic construct relevant to a range of emotional disorders (Fernández de la Cruz et al., 2013).

More recently, Ayers, Castriotta, Dozier, Espejo, and Porter (2014) investigated the relationship between hoarding severity, EA, as measured by the 10-item version of the AAQ-II (Bond et al., 2011), and avoidant behaviours as measured by the Brief COPE scales of Self-Distraction, Denial, and Behavioural Disengagement (Carver, 1997) in a HD sample \( (N = 66) \). Experiential avoidance was significantly associated with the total scores and all three subscale scores of the SI-R (Frost et al., 2004). With regard to behavioural avoidance, SI-R total scores were significantly correlated with the Self-Distraction and Behavioural Disengagement scales, but not the Denial scale of the Brief COPE. While the clutter subscale was also associated with the Self-Distraction and Behavioural Disengagement scales, the acquisition and difficulty discarding subscales were only correlated with the Self-Distraction scale. Hierarchical regression analyses revealed that after controlling for anxiety and depression symptoms, EA and behavioural avoidance uniquely accounted for different facets of hoarding severity. Specifically, EA accounted for significant additional variance in the difficulty
discarding and acquisition subscales, while the Self-Distraction and Behavioural Disengagement scales contributed significant additional variance to the clutter subscale.

The researchers maintain that the finding that EA, but not behavioural avoidance, was a unique predictor of acquisition and difficulty discarding is consistent with the CBT conceptualisation of these symptoms as avoidance behaviours that serve to alleviate negative emotions invoked by mistaken beliefs about possessions. As such, acquiring and saving behaviour may represent an avenue through which HD individuals engage in EA (Ayers et al., 2014). The authors suggest that the measure of behavioural avoidance may not have predicted acquisition and difficulty discarding because they are themselves forms of behavioural avoidance. That is, perhaps acquiring is a form of behavioural self-distraction, and difficulty discarding is a form of behavioural disengagement. As clutter is the direct consequence of excessive acquisition and saving behaviour, the finding that clutter was uniquely predicted by behavioural avoidance (i.e., self-distraction and behavioural disengagement) is consistent with the CBT model (Ayers et al., 2014).

In summary, while EA is likely a transdiagnostic construct, there is some evidence to suggest that it may be relevant for HD symptoms, although more research is required given the inconsistent findings in the literature to date. These inconsistencies may be due to differences in the sample characteristics of the studies. In contrast to the previous studies (i.e., Fernández de la Cruz et al., 2013; Wheaton et al., 2013), Ayers et al. (2014) had a larger sample size and therefore increased power to detect significant relationships. They also recruited treatment-seeking individuals, while the other studies recruited non-treatment-seeking individuals from the general population. Finally, this study had a sample with a higher mean age, and therefore represented an older population of individuals with hoarding difficulties (Ayers et al., 2014). Further research is required on the role of EA and hoarding behaviour.

**Empirical research on alexithymia and hoarding.**

To date, the construct of alexithymia has received little attention in the literature on HD. However, one study has investigated a construct inversely related to alexithymia (i.e., emotional intelligence) in a sample of individuals with hoarding behaviour (Grisham et al., 2008). The measure used in this study, the Emotional Intelligence Scale (EIS; Schutte et al., 1998), has established validity by its relevance to theoretically
related constructs, demonstrating that higher scores on the EIS are positively correlated with greater attention to feelings, greater clarity of feelings, and more mood repair, as measured by the Trait-Meta Mood Scale (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995), and less alexithymia, as measured by the difficulty identifying and difficulty describing feelings subscales of the TAS-20 (Bagby, Parker, et al., 1994). Grisham et al. compared individuals with hoarding \((n = 30)\) to non-hoarding patients with an anxiety or mood disorder other than OCD \((n = 30)\) and non-clinical community participants \((n = 30)\) on the EIS, with results showing no significant differences in emotional intelligence between groups. This finding was unexpected, as the authors postulated that the features of poor insight and social impairment associated with hoarding might signify more general deficits in self-awareness, and impaired social and emotional understanding (Grisham et al., 2008).

Other research on related disorders may lend some support for the notion that alexithymia might be implicated in hoarding behaviour. For example, Rose and Segrist (2012) investigated alexithymia in relation to compulsive buying in a sample of internet workers from across the United States and Canada \((N = 213)\), and found that the difficulty identifying feelings subscale of the TAS-20 (Bagby, Parker, et al., 1994) was positively associated with compulsive buying. Furthermore, the difficulty identifying feelings subscale significantly predicted compulsive buying even after controlling for sex, age, income, and level of education (Rose & Segrist, 2012).

Research investigating alexithymia in relation to OCD symptom dimensions has provided mixed results. For example, Roh, Kim and Kim (2011) found that ‘sexual/religious obsessions’ was the only symptom dimension that was a statistically significant predictor of alexithymia in an OCD patient sample, and that the other symptom dimensions of symmetry/ordering, hoarding, contamination/cleaning, and aggressive/checking were not significantly associated with alexithymia. In contrast, Stern et al. (2014) found that in an analogue OCD sample, the difficulty identifying and describing feelings facets of alexithymia were significantly positively associated with all OCD symptom dimensions, including hoarding. Another recent study provides additional support for a relationship between hoarding symptoms and alexithymia. In a large Italian community sample \((N = 425)\), Pozza, Giaquinta, and Dèttore (2015) investigated the relationship between alexithymia, as measured by the TAS-20 (Bagby, Parker, et al., 1994), and specific OCD symptom dimensions, as measured by the
Obsessive-Compulsive Inventory Revised (OCI-R; Foa et al., 2002). Results demonstrated significant moderate correlations between the TAS-20 total and OCI-R total scores, and between the TAS-20 total and the hoarding and obsessing subscales of the OCI-R. With regard to the three dimensions of alexithymia, the difficulty identifying feelings subscale was moderately correlated with OCI-R total, as well as with the hoarding and checking subscales of the OCI-R; the difficulty describing feelings subscale demonstrated moderate correlations with the OCI-R total and obsessing subscale, and low correlations with the hoarding, checking, ordering, and washing subscales of the OCI-R; and the externally-oriented thinking subscale demonstrated low correlations with the OCI-R total, and the hoarding, checking, ordering, and neutralising subscales. A linear regression model including depression scores, anxiety scores, and all three facets of the TAS-20 explained 37% of the total variance in OCD symptoms, with the difficulty identifying feelings dimension of alexithymia being a unique and significant predictor of OCD symptoms after controlling for anxiety and depression. In addition, multiple regression analyses revealed a main effect of alexithymia on ordering symptoms and alexithymia on obsessing symptoms (Pozza et al., 2015).

In light of these findings Pozza et al. (2015) suggest that interventions for OCD individuals with hoarding and checking symptoms should address difficulties with identifying feelings. The authors note several ways in which their findings could be interpreted. Firstly, they suggest that hoarding and checking symptoms appear to represent compulsive behaviours that OCD individuals engage in as a way of coping with negative emotions, which may be indicative of difficulties with identifying and tolerating negative emotions. Alternatively, given that individuals with hoarding symptoms have strong emotional attachments to their possessions, they may have deficits in emotional awareness and mental representations of the self and others. Difficulties identifying feelings might also be linked to poorer insight of symptoms, and may help explain why individuals with HD tend to respond negatively to treatment. That is, if individuals with hoarding problems have poor emotional awareness, they may have difficulty developing an exposure hierarchy, difficulty confronting anxiety-related experiences during exposure tasks, and reluctance to adhere to treatment goals (Pozza et al., 2015).
The research on alexithymia in OCD samples tends to indicate that alexithymia is higher in OCD compared to non-clinical groups, but not compared to other clinical groups (for a detailed review, see L. J. Robinson & Freeston, 2014). There is also research demonstrating that alexithymia is associated with MDD and GAD (e.g., Leweke et al., 2011; Onur et al., 2013; Wise, Mann, & Randell, 1995), and given the comorbidity between these disorders and HD, alexithymia is an important construct to investigate in relation to hoarding.

In summary, although there are a few studies reporting differential findings on alexithymia and hoarding symptoms, there is some preliminary research to suggest that alexithymia may be associated with hoarding behaviour. However, given that the sole study investigating alexithymia in a hoarding sample utilised a unidimensional measure of emotional intelligence, and the other research on OCD and community samples measured hoarding via a few items from OCD symptom measures, further research is required on the role of alexithymia in relation to hoarding behaviour utilising the multifaceted construct of alexithymia (i.e., TAS-20; Bagby, Parker, et al., 1994) and more comprehensive hoarding-specific measures (i.e., SI-R; Frost et al., 2004).

**Empirical research on impulsivity and hoarding behaviour.**

The construct of impulsivity has been measured in relation to hoarding behaviour from a neuropsychological perspective as well as via psychological self-report measures. With regard to the former, studies utilising neuropsychological tests that measure response inhibition have demonstrated mixed results. Grisham, Brown, Savage, Steketee, and Barlow (2007) compared a group of individuals with hoarding ($n = 30$), to a mixed clinical group ($n = 30$) and a non-clinical group ($n = 30$) on a series of neuropsychological tasks. Results demonstrated that on a continuous performance test, which measures sustained attention and the ability to suppress impulsive responses, the hoarding group had significantly more commission errors than both comparison groups (indicative of impulsivity), and significantly slower reaction time compared to the clinical comparison group. Increased impulsivity and slower reaction time was significantly associated with hoarding symptoms even after controlling for depression, schizotypy, and other OCD symptoms (Grisham et al., 2007). In contrast, Tolin, Villavicencio, Umbach, and Kurtz (2011) did not find that hoarding patients ($n = 27$) had increased impulsivity as measured by the continuous performance test as compared...
to OCD patients \((n = 12)\). Likewise, Fitch and Cougle (2013) compared a non-clinical hoarding group to a control group controlling for age, and found no significant group differences in impulsivity as measured by errors of commission on a continuous performance test.

In a study utilising a similar test for measuring response inhibition (i.e., Affective Go/No-go subtest; Cambridge Cognition, 1995), Grisham, Norberg, Williams, Certoma, and Kadib (2010) found that participants with hoarding problems \((n = 19)\) did not significantly differ in performance from participants with an Axis I mood or anxiety disorder \((n = 17)\) or non-clinical controls \((n = 20)\). Blom et al. (2011) also failed to find significant differences between individuals with hoarding \((n = 24)\), non-hoarding OCD patients \((n = 17)\), and non-clinical controls \((n = 19)\) on a visual choice reaction time task intended to measure response inhibition. More recently, Morein-Zamir et al. (2014) investigated response inhibition as measured by a stop-signal task in a sample of HD individuals without comorbid OCD \((n = 22)\), OCD individuals with severe hoarding \((n = 24)\), and healthy controls \((n = 28)\). While both clinical groups performed significantly worse than healthy controls, they did not differ from each other, suggesting that hoarding behaviour (with or without comorbid OCD) is associated with difficulties with response inhibition (Morein-Zamir et al., 2014).

Rasmussen, Brown, Steketee, and Barlow (2013) investigated impulsivity in individuals with HD \((n = 32)\) and anxiety disorders \((n = 32)\) on several neuropsychological tasks. Results demonstrated that compared to the anxiety disorders group, the HD group had a decreased ability to inhibit their reactions, as measured by performance on the Sustained Attention to Response Task (SART; Gay, Rochat, Billieux, d’Acremont, & Van der Linden, 2008; Robertson, Manly, Andrade, Baddeley, & Yiend, 1997). This task requires participants to withhold a key press in response to a rare target, with commission errors being the measure of impulsivity. Results also demonstrated that the HD group did not demonstrate greater risk-taking behaviour than the anxiety disorders group, as measured by performance on the Balloon Analogue Risk Task (BART; Lejuez et al., 2002). For this task, participants are presented with a computer simulated balloon and balloon pump, and are instructed that with every mouse click the balloon will increase by a degree and earn them 25 cents. Participants have the option of stopping at any time to transfer their earnings from a temporary reserve to a total earned box, and are informed that the balloon can explode at any time which will
result in losing all the money in their temporary reserve. In contrast to expectations, the HD group demonstrated significantly fewer average balloon pumps and fewer total explosions on this task than the anxiety disorders group, which was indicative of more caution instead of greater risk taking on this task (Rasmussen et al., 2013). Between group comparisons revealed that a diagnosis of HD significantly predicted the number of commission errors on the SART after controlling for GAD and MDD, and the number of explosions and average pumps on the BART after controlling for social phobia, GAD, and MDD. However, these findings were no longer significant after controlling for age (Rasmussen et al., 2013). Within group analyses for the hoarding sample revealed that both the clutter and difficulty discarding facets of hoarding were negatively associated with average number of pumps and the total number of explosions on the BART, while the acquisition facet was positively correlated with the number of commission errors on the SART. However, these associations ceased to remain statistically significant after controlling for age. While this research suggests that the relationship between hoarding and impulsivity might be accounted for by age, the authors note that there was a substantial age difference between the comparison groups in this study, along with limited power to detect between and within group differences (Rasmussen et al., 2013).

Researchers have also utilised planning tasks (e.g., Stockings of Cambridge; Cambridge Cognition, 1995) and gambling tasks (e.g., The Iowa Gambling Task; Bechara et al., 1994; Cambridge Gambling Task; Cambridge Cognition, 1995) which, in addition to measuring planning and decision-making abilities, may also indirectly measure impulsivity and difficulties with reward processing. Again, there are inconsistent findings in the literature with respect to these tasks in relation to hoarding (for a detailed review, see Timpano, Smith, et al., 2014; Woody et al., 2014).

The construct of impulsivity has commonly been investigated through the use of psychological self-report measures such as the Barratt Impulsiveness Scale (BIS; Patton, Stanford, & Barratt, 1995), and the UPPS/UPPS-P Impulsive Behavior Scale (Lynam et al., 2007; Whiteside & Lynam, 2001). Several studies demonstrate that self-reported impulsivity is associated with compulsive buying (e.g., Alemis & Yap, 2013; Billieux, Rochat, Rebetez, & Van der Linden, 2008; Murphy, Cooper, Doran, & Rose, 2012; Rose & Segrist, 2014; A. D. Williams & Grisham, 2012), providing support for the role of impulsivity in relation to compulsive acquisition behaviours. For example, A.
D. Williams and Grisham (2012) found that greater levels of compulsive buying were significantly associated with the lack of perseverance, lack of premeditation, positive urgency, and negative urgency domains of the UPPS-P (Lynam et al., 2007), but not the facet of sensation seeking. Furthermore, compulsive buyers (n = 49) scored significantly higher than healthy controls (n = 37) on all UPPS-P domains even after controlling for gambling and psychopathology (A. D. Williams & Grisham, 2012). Other studies utilising multiple regression analyses have demonstrated that urgency is the only UPPS impulsivity facet that is significantly predictive of compulsive buying after controlling for relevant covariates (Billieux et al., 2008; Murphy et al., 2012), while Rose and Segrist (2014) found that both negative and positive urgency independently predicted compulsive buying and accounted for similar amounts of variance. Given the overlap between compulsive buying and the acquiring features of HD, it is likely that self-reported impulsivity is also associated with hoarding behaviour.

In an investigation of hoarding symptoms in a compulsive buying sample (N = 66), Mueller et al. (2007) found that total hoarding symptoms were not significantly associated with the BIS (Patton et al., 1995), although the acquisition dimension of hoarding was moderately positively correlated with the BIS. No significant differences in impulsivity scores were found between a subgroup of non-hoarding compulsive buyers and a subgroup of hoarding compulsive buyers (Mueller et al., 2007). In contrast, other research provides support for the relationship between hoarding and impulsivity, as measured by the BIS. For example, Fitch and Cougle (2013) found that compared to a control group, a non-clinical hoarding group scored significantly higher on all three impulsivity dimensions of the BIS (i.e., non-planning, motor, and attentional impulsivity). While the average impulsivity scores for both groups fell within the normal range, the non-clinical hoarding group was significantly higher than the control group even after controlling for depression, anxiety, and non-hoarding obsessive-compulsive symptoms (Fitch & Cougle, 2013). Likewise, Hezel and Hooley (2014) found that in an unscreened community sample (N = 80) hoarding symptoms were significantly associated with higher levels of impulsivity as measured by the BIS. After classifying the sample into a clinical hoarding group and a low-hoarding group, results demonstrated that participants in the clinical hoarding group had greater impulsivity than those in the low-hoarding group.
In a cross-cultural investigation of impulsivity and hoarding, Timpano, Rasmussen, et al. (2013) found that in a sample of American young adults ($N = 372$), greater hoarding symptoms were significantly associated with greater impulsivity, as measured by the total, attentional, motor, and non-planning impulsiveness subscales of the BIS (Patton et al., 1995). Furthermore, compared to participants classified in a low hoarding group, participants in high hoarding group reported significantly greater levels of total, attentional, and motor impulsivity after controlling for anxiety, depression, non-hoarding obsessive-compulsive symptoms, and alcohol use problems (Timpano, Rasmussen, et al., 2013). The role of impulsivity in hoarding was further supported in their second sample of German young adults ($N = 160$), with results showing that the UPPS total score (Whiteside & Lynam, 2001) was positively correlated with total hoarding severity, and the clutter, difficulty discarding, and acquisition subscales of a German hoarding measure. In particular, the UPPS facets of (negative) urgency and lack of perseverance were positively associated with total hoarding scores, and all three subscale scores. Additionally, participants classified in a high hoarding group reported significantly higher levels of UPPS total, negative urgency, and lack of perseverance impulsivity after controlling for anxiety, depression, and non-hoarding obsessive-compulsive symptoms, compared to those classified in a low hoarding group (Timpano, Rasmussen, et al., 2013).

Across both samples, Timpano and colleagues (2013) found that both impulsivity, as measured by the UPPS (Whiteside & Lynam, 2001) or the BIS (Patton et al., 1995), and compulsivity, as measured by non-hoarding obsessive-compulsive symptoms, explained unique variance in hoarding symptoms. Specifically, in the US sample, compulsivity, attentional impulsiveness, and motor impulsiveness were found to be independent predictors of hoarding symptoms (i.e., SI-R total, clutter, difficulty discarding, and acquisition) after controlling for anxiety, depression, and alcohol use problems. While compulsivity was mostly a stronger predictor of hoarding than impulsivity, the difference was not statistically significant. The exception to this was with the difficulty discarding subscale, where compulsivity accounted for significantly more variance than motor impulsiveness. In the German sample, compulsivity, negative urgency, and lack of perseverance were unique significant predictors of hoarding symptoms (i.e., SI-R total, clutter, difficulty discarding, and acquisition) after controlling for anxiety and depression. There was one exception to this, where
compulsivity was not a significant predictor in a model that included the lack of perseverance variable in predicting difficulty discarding. While the UPPS lack of perseverance and negative urgency subscales appeared to be the stronger predictors of hoarding than compulsivity, this difference was not statistically significant. The study by Timpano and colleagues (2013) provides sound evidence that impulsivity uniquely contributes to hoarding symptoms, given the replication of significant associations between hoarding severity and greater levels of impulsivity after controlling for general depression and anxiety symptoms in two cross-cultural samples using two distinct measures of impulsivity.

In contrast, Rasmussen et al. (2013) did not find a significant difference between HD participants and anxiety disorders participants on self-reported impulsivity as measured by the UPPS (Whiteside & Lynam, 2001). Although a HD diagnosis predicted higher levels of self-reported negative urgency after controlling for social phobia, generalised anxiety, and MDD, this effect was no longer present after controlling for age (Rasmussen et al., 2013).

More recently, Phung et al. (2015) investigated negative urgency, as measured by the original urgency subscale of the UPPS (Whiteside & Lynam, 2001), hoarding symptoms, as measured by the SI-R (Frost et al., 2004), and beliefs about emotional attachment to possessions, as measured by the emotional attachment subscale of the Saving Cognitions Inventory (SCI; Steketee et al., 2003) in a non-clinical sample (N = 150). Correlational analyses revealed a moderate-to-strong positive association between hoarding symptoms and negative urgency, and a moderate-to-strong correlation between negative urgency and beliefs about emotional attachment to possessions. Negative urgency was also found to be positively associated with the acquisition, clutter, and difficulty discarding subscales of the SI-R, with the correlation between negative urgency and acquisition being significantly higher than the correlation between negative urgency and clutter. After classifying participants exceeding the clinical cut-off score for the SI-R as a high hoarding group, results revealed that compared to the rest of the sample, participants in the high hoarding group scored significantly higher on negative urgency. Further regression analyses demonstrated that negative urgency was a significant predictor of hoarding severity after controlling for depression. A mediation analysis demonstrated that beliefs about emotional attachment to possessions partially mediated the relationship between negative urgency and hoarding symptoms, with
emotional attachment beliefs explaining 42% of the effect. Including age as a covariate in the mediation model did not change the pattern of significance (Phung et al., 2015).

This study provides evidence for the distinct role of negative urgency in the prediction of hoarding symptoms. As noted by Phung et al. (2015), higher negative urgency might be conceptualised as the more “action-oriented” aspect of poor ER in hoarding, providing a link between intolerance of emotions and avoidance behaviour. For example, when individuals with HD experience distress, negative urgency may lead to the need to act, which may provoke increased compulsive buying and impulsive collecting, which contribute to excessive acquisition behaviours. Likewise, when an individual feels unable to cope with the negative emotions associated with the decision to discard a possession, high negative urgency may result in the act of abandoning the task in preference for other activities. As such, negative urgency could lead directly to impulsive acquisition behaviour or impulsive avoidance of discarding, irrespective of emotional attachment beliefs. However, negative urgency may also contribute to hoarding symptoms via emotional attachment beliefs. That is, perhaps in the presence of emotion dysregulation or poor ER strategies (e.g., impulsivity), there is a greater need for those with HD to rely on possessions as a form of ER (i.e., seeking comfort from possessions as a way of alleviating negative emotions), which over time leads to stronger emotional attachments to possessions, and the formation of beliefs that possessions are needed for emotional stability. Consequently, attachment to and beliefs about possessions would contribute to abnormal saving behaviours and difficulty discarding, culminating in clinical hoarding symptoms (Phung et al., 2015).

In addition to the abovementioned research, impulse control difficulties may also fall under the wider umbrella of self-control deficits. Timpano and Schmidt (2010, 2013) postulated that low self-control may underlie the difficulties individuals with HD have with superseding their impulses and emotions (e.g., resisting urges to acquire and save possessions), and following through on their goals (e.g., persisting with sorting, organising, and discarding tasks). Drawing on a resource model of self-control (Baumeister, Gailliot, DeWall, & Oaten, 2006) which proposes that exercising self-control in one instance depletes the capacity for exercising self-control in a subsequent situation (i.e., self-control depletion), Timpano and Schmidt (2013) investigated self-control resources and hoarding symptoms across three independent samples. In a large undergraduate sample \(N = 484\) low self-control was significantly correlated with
greater hoarding severity. This finding remained significant even after controlling for general symptoms of depression, and anxiety, specific symptoms of anxiety (i.e., obsessions, social interaction fears, excessive worry), and impulse control related symptoms (i.e., problem drinking and binge and purge eating disorder symptoms), with low self-control being the strongest predictor. Low self-control was also significantly associated with all three subscales of the SI-R (Frost et al., 2004), and remained a significant predictor of acquisition, clutter, and difficulty discarding even after controlling for these covariates. In a second clinical sample (N = 135) participants meeting criteria for clinical hoarding (n = 19) reported significantly lower levels of self-control than participants meeting criteria for OCD (n = 23), SAD (n = 64), and GAD (n = 29). This difference remained statistically significant after controlling for overall clinical severity, and symptoms of depression, anxiety, and stress. The other three clinical groups did not differ from one another with regard to levels of self-control (Timpano & Schmidt, 2013).

In their third study, Timpano and Schmidt (2013) used an experimental design on an undergraduate sample (N = 102) to test the impact of depleted self-control on a behavioural index of hoarding symptoms. Participants were randomly assigned to a depletion or control condition. Participants in the depletion condition were administered three tasks designed to deplete self-control resources: 1) a Stroop depletion task where the words of colours were printed in an incongruent colour and participants had to state the print colour, 2) a short story task where participants were required to write a story about a recent vacation without using the letters ‘a’ or ‘n’, and 3) a letter task, where participants were required to cross out the letter ‘e’ only if there was another vowel adjacent to it or one letter removed. Participants in the control condition received a colour and word congruent Stroop task, and no restrictions on the second and third tasks. After completing these tasks, all participants completed a discarding task. For the discarding task, participants were required to bring 14 paper items to the lab that they would typically collect and tend to have trouble discarding. Five lab paper control items were included in the task. The researcher randomly selected an item and asked the participant if they would like to save it (in which case the participant could take it home), wait to decide (in which case the decision would be revisited at the end of the experiment), or discard it (in which case the item would be immediately shredded). Participants were informed that the goal was to discard as many items as possible. They
also provided a value rating for all items (Timpano & Schmidt, 2013). Results demonstrated that low self-control was significantly correlated with hoarding symptoms even after controlling for general depression. There were no significant differences in number of items discarded across the three self-control depletion methods, so the data was collapsed across method. Regression analyses revealed that even after controlling for SI-R scores (Frost et al., 2004), participants in the depletion condition discarded significantly fewer items than those in the control condition. Furthermore, individuals classified as high on hoarding (i.e., above the SI-R mean) discarded significantly fewer items than those classified as low on hoarding (i.e., below the SI-R mean). Compared to the control group, participants in the depletion condition saved more items, waited to decide for more items, and discarded fewer items. The depletion manipulation had a stronger effect for personal items saved and discarded, compared to lab items saved and discarded. A similar effect for personal and lab items was found for those items placed in the waited category (Timpano & Schmidt, 2013).

Collectively these three studies suggest that deficits in self-control are associated with hoarding symptoms, and that depleting self-control resources is associated with a subsequent increase in saving behaviours (Timpano & Schmidt, 2013). While this research highlights the role of low self-control in hoarding behaviour generally, other research suggests that inhibited self-control may be more specifically related to acquiring problems. For example, in a large hoarding sample (N = 526), Frost et al. (2013) found that inhibited self-control was associated with increased hoarding symptoms, as measured by the hoarding rating scale (HRS-SR; Tolin, Frost, & Steketee, 2010) and the SI-R total, clutter, acquisition, and difficulty discarding scores (Frost et al., 2004), along with compulsive buying behaviour and the acquisition of free items. However, inhibited self-control was found to be a significant predictor of compulsive buying and excessive acquisition, but not difficulty discarding, clutter, or the acquisition of free things. Individuals categorised as current acquirers (n = 220) had significantly less self-control than past acquirers (n = 103), and non-acquirers (n = 46). Furthermore, current and past acquirers reported significantly more avoidance of situations in which the urge to acquire may occur compared to non-acquirers, but there was no significant difference between them. Although there was a trend for current acquirers to engage in more acquiring-related avoidance, this research suggests that HD individuals who deny
current acquiring problems may still experience urges to acquire that they attempt to control by avoiding acquiring-related cues and situations (Frost et al., 2013).

In summary, despite inconsistent findings in the neurological literature with regard to impulsivity and hoarding, research utilising psychological self-report measures more consistently shows that hoarding is associated with increased impulsivity. While mixed findings are noted, overall the BIS (Patton et al., 1995) and the facets of (negative) urgency and a lack of perseverance (Whiteside & Lynam, 2001) appear to be most relevant to hoarding symptoms. Additionally, research suggests that self-control deficits are implicated in hoarding. There is also some evidence to suggest that both negative and positive urgency are equally important in a hoarding-related phenomenon; compulsive buying. However, to date there has been no published research on the role of positive urgency in relation to hoarding symptoms, and whether negative and positive urgency are similarly associated with hoarding symptom dimensions.

**Empirical research on emotional intolerance and hoarding.**

While not the focus of the current project, other ER constructs that have been investigated in relation to hoarding include those that measure the ability to tolerate emotions, such as anxiety sensitivity (AS) and DT. Anxiety sensitivity refers to an individual’s tendency to fear anxiety-related sensations, due to beliefs about the harmfulness of experiencing those sensations (Reiss & McNally, 1985; S. Taylor et al., 2007). Anxiety sensitivity has been described as the “fear of fear”, with high levels reflecting beliefs that anxiety- or arousal-related sensations are dangerous and have negative consequences at physical, psychological, and social levels (S. Taylor, 1999; S. Taylor, Koch, & McNally, 1992). On experiencing anxiety, individuals high in AS become afraid about their arousal-related physiological sensations, which serves to amplify their anxiety and can lead to greater levels of emotional avoidance (S. Taylor, 1999; S. Taylor et al., 1992).

In the first investigation of AS and hoarding behaviour, Coles et al. (2003p. 179) found a “surprisingly strong” relationship between AS and hoarding symptoms in a large non-clinical sample ($N = 563$). The researchers postulated that increased levels of AS may be a contributing factor to avoidance behaviours in hoarding, in that individuals high in AS may engage in maladaptive hoarding behaviours (e.g., saving) as a way of
avoiding or escaping the unpleasant emotional experiences (including but not limited to anxiety) associated with discarding. Subsequent research demonstrates that high AS is associated with greater hoarding severity in non-clinical samples (Medley, Capron, Korte, & Schmidt, 2013; Phung et al., 2015; Timpano, Buckner, Richey, Murphy, & Schmidt, 2009), and that AS is a significant predictor of hoarding symptoms even after accounting for depression (Medley et al., 2013; Phung et al., 2015; Timpano et al., 2009) and non-hoarding obsessive-compulsive symptoms (Timpano et al., 2009). A recent study also established that participants scoring above the clinical cut-off for hoarding scored significantly higher on AS compared to those scoring below the clinical cut-off, and that the relationship between AS and hoarding symptoms was fully mediated by beliefs about emotional attachment to possessions (Phung et al., 2015).

Distress tolerance is a similar construct to AS, but where AS denotes fears specifically about anxiety-related sensations, DT refers to the capacity to withstand and experience any negative psychological state (Simons & Gaher, 2005). Individuals with low DT are expected to find distress unbearable or intolerable, and to have appraisals of distress that are characterised by lack of acceptance, shame, and perceptions that their coping abilities are poorer than others. Furthermore, individuals with low DT are expected to emotionally regulate in ways that require great effort to avoid negative emotions and use rapid strategies for alleviating such states. Finally, if unsuccessful at alleviating negative emotions, individuals with low DT are predicted to feel consumed by their emotional experience, and to report that their attention is absorbed by the distressing experience and interferes with their functioning (Simons & Gaher, 2005).

The distress tolerance scale (DTS; Simons & Gaher, 2005) is a widely used measure that assesses overall DT and four subscales including tolerance, absorption, appraisal, and regulation of distress, with higher scores indicating better ability to tolerate distress.

Several studies have demonstrated that increased hoarding severity is associated with lower DT in non-clinical samples (Hezel & Hooley, 2014; Phung et al., 2015; Timpano et al., 2009; Timpano, Shaw, Cougle, & Fitch, 2014). In a large undergraduate sample ($N = 409$), Timpano et al. (2009) found that the absorption facet of the DTS (Simons & Gaher, 2005) was significantly associated with hoarding after controlling for depression, anxiety, and non-hoarding obsessive-compulsive symptoms. As absorption signifies feeling overwhelmed by and immersed in the experience of distress, the authors suggested that saving and acquisition behaviours might represent attempts to
regulate distress (Timpano et al., 2009). In a further study, Timpano, Shaw, et al. (2014) demonstrated that after controlling for depressive and anxiety symptoms, non-clinical participants classified in a high hoarding group had significantly lower DT, scored significantly higher on threatening appraisals of emotions, and endorsed significantly more intense emotional reactions and were more intolerant of negative emotions after viewing a series of short film clips designed to evoke sadness, fear, disgust, and anger. Such research suggests that avoidance in hoarding may not only arise from fearing emotions, but also from the perception that one cannot tolerate or cope with such emotions (Timpano, Shaw, et al., 2014). Other research has found emotional states to influence the relationship between DT and behaviour, in that lower DT is associated with less discarding of personal items only for participants experiencing a sad emotional state (Norberg, Keyen, and Grisham, 2015).

Recent research suggests that when considered concurrently, DT may be less influential than AS and negative urgency in predicting hoarding severity (Phung et al., 2015). However, the authors note that the contribution of DT may have been incorporated under negative urgency, which addresses tolerance, or AS, which addresses distress, or depression, which may be a consequence of emotion dysregulation (Phung et al., 2015). Other research has found that the latent construct of emotional intolerance, as indicated by measures of AS and DT, is significantly associated with hoarding symptoms, and partially mediates the relationship between stress and hoarding (Timpano, Keough, et al., 2011). Similarly, an examination of an extended latent construct of affect intolerance which included variables assessing one’s ability to tolerate anxiety, distress, disgust, and uncertainty, was found to be significantly associated with greater hoarding severity in an undergraduate sample, and saving cognitions interacted with affect intolerance in predicting hoarding symptoms (A. M. Shaw, Llabre, and Timpano, 2015).

Finally, research on emotional reactivity in a large sample of participants with self-identified hoarding problems ($N = 628$) has found that after controlling for covariates (i.e., age, gender, anxiety, depression), general levels of self-reported emotional reactivity were significantly associated with greater overall hoarding severity, and the acquisition and difficulty discarding symptom dimensions (A. M. Shaw, Timpano, Steketee, Tolin, and Frost, 2015). Furthermore, more intense negative emotional reactions to imagined discarding were significantly correlated with greater
total hoarding severity, acquisition and difficulty discarding, but not with clutter. This study indicates that HD individuals experience a range of negative emotions more intensely and that the experience of intense emotional reactions may not be restricted to hoarding contexts (A. M. Shaw, Timpano, et al., 2015).

In summary, research has demonstrated that hoarding is associated with high AS, low DT, emotional/affect intolerance, and heightened emotional reactivity. Such research suggests that in the presence of intense emotional reactions and poor ability to tolerate distress, individuals may engage in avoidance-based behaviours such as acquiring and difficulty discarding. Furthermore, emotional intolerance may interact with other cognitive factors and mood, to influence hoarding symptoms and severity. Although it is likely that there is some overlap between these emotional intolerance constructs, and that some constructs may be more influential in predicting hoarding symptoms than others, this research collectively highlights that hoarding is associated with disturbances in emotional reactivity, processing, and tolerance, indicating a robust association between ER difficulties and hoarding.

Empirical research on emotion regulation strategies and hoarding.

To date there has been no published research on the use of specific ER strategies such as expressive suppression and cognitive reappraisal in hoarding samples. However, research demonstrates that other disorders that co-occur with hoarding are associated with the use of these strategies. For example, expressive suppression shares unique positive associations with obsessive-compulsive symptoms (Fergus & Bardeen, 2014), and individuals with MDD more frequently use expressive suppression, and less frequently use reappraisal, compared to never-disordered controls (D'Avanzato et al., 2013).

In the related area of coping, a recent study on a large Turkish community sample ($N = 775$) found that after controlling for age, gender, and income level, greater hoarding severity was significantly associated with greater use of coping strategies, such as keeping to self, escape/avoidance, accepting responsibility, and refuge in supernatural forces (Yorulmaz & Dermihan, 2015). Although the magnitude of these associations was relatively small, all of these coping strategies were significantly correlated with the SI-R (Frost et al., 2004) total, acquisition, clutter, and difficulty discarding subscales, with the exception of a non-significant relationship between
clutter and the accepting responsibility coping strategy. Additionally, the coping strategy of planned problem solving was found to be negatively associated with total hoarding symptoms, and all three symptom dimensions. Neither seeking social supports nor seeking refuge in fate were significantly associated with hoarding. In a subset of the sample that scored one standard deviation above the group mean on the SI-R, hoarding was positively associated with seeking refuge in supernatural forces, accepting responsibility, and escape/avoidance coping strategies, and negatively associated with planned problem solving, after controlling for covariates (Yorulmaz & Dermihan, 2015).

Results from regression analyses revealed that belief in supernatural forces, accepting responsibility, and escape/avoidance strategies were significant positive predictors of total hoarding symptoms, while the planned problem solving strategy was a significant negative predictor (Yorulmaz & Dermihan, 2015). In addition, indecisiveness, emotional attachment, and metacognitive factors (i.e., positive and negative beliefs about worry, and cognitive confidence), were found to be significant positive predictors of total hoarding symptoms. For participants classified in a high hoarding group, escape/avoidance, accepting responsibility, planned problem solving, and cognitive confidence were found to be significant predictors of total hoarding symptoms (Yorulmaz & Dermihan, 2015). Overall these results supported the researchers’ hypotheses that hoarding severity would be positively related to emotion-focused coping strategies, and negatively related to problem-focused coping strategies.

As noted by Yorulmaz and Dermihan (2015), the use of the strategy keeping to self is consistent with the emotions of shame and guilt associated with hoarding, as well as with efforts to conceal their problems and prevent people from entering the home. The accepting responsibility strategy may be linked to the responsibility for possessions, while seeking refuge in supernatural forces as a way of coping may reflect the relationship between hoarding and magical thinking and superstition. The negative association between planned problem-solving and hoarding is consistent with the information processing deficits in the areas of attention, categorisation, organisation, and impulsivity. The use of these coping strategies may be culture-specific, and therefore more research is required with respect to coping and ER efforts across cultures (Yorulmaz & Dermihan, 2015).
To date, there has been no published research on how individuals with HD attempt to cope with or manage their own emotions. However, an unpublished doctoral dissertation by Miranda (2011) investigated the relationship between coping styles and hoarding symptom severity as it relates to psychological distress in a sample of individuals with hoarding difficulties ($N = 67$). Results demonstrated that emotion-oriented and distraction-oriented coping were positively associated with hoarding severity. In addition, emotion-oriented, avoidance-oriented, and distraction-oriented coping styles and hoarding severity were positively correlated with psychological distress. Regression analyses revealed that avoidance-oriented coping and hoarding severity were unique positive predictors of psychological distress. Likewise, distraction-oriented coping and hoarding severity were found to be unique positive predictors of psychological distress, while emotion-oriented coping predicted psychological distress above and beyond hoarding severity. This research highlights that coping styles are associated with hoarding severity and impact on psychological distress. However, further research is required on the use of specific ER strategies (such as cognitive reappraisal and expressive suppression) in relation to hoarding, along with more in-depth exploration of how individuals with hoarding difficulties understand and attempt to regulate their emotions.

**Chapter Summary**

This chapter first outlined the theoretical rationale for investigating ER in relation to hoarding, by conceptualising aspects of the CBT model and phenomenology of HD under an ER framework, and then by applying two contemporary models of ER to features of the disorder. Subsequently, the empirical research conducted to date on the role of ER in hoarding behaviour was discussed. Collectively, there appears to be a sound rationale for this area of research, with some empirical support for the role of ER difficulties in hoarding. The most consistent findings in the literature suggest that individuals with hoarding experience difficulties with impulse control and emotional tolerance (i.e., heightened AS and low DT). While increased self-reported impulsivity is consistently associated with HD, particularly in the areas of negative urgency, lack of perseverance, and low self-control, and there is evidence to suggest that both negative and positive urgency are equally important in compulsive buying, no research has been conducted on the role of positive urgency in relation to HD. This is an important area
for investigation, given that the CBT model of hoarding maintains that positive emotions are reinforcing of acquiring and saving behaviour. As such, research is required on the ability to inhibit impulsive action under conditions of positive affect, and whether negative urgency and positive urgency are similarly associated with various hoarding behaviours.

There is some evidence to suggest that individuals with hoarding problems experience difficulties with ER, however only two studies have investigated the DERS (Gratz & Roemer, 2004) in relation to hoarding behaviour and they have revealed inconsistent findings. Furthermore, neither study assessed the relationships between the symptom dimensions of hoarding and the six facets of the DERS. As such, further research is required in this area. In particular, a more fine-grained analysis of the differential relationships between various facets of emotion dysregulation and specific hoarding behaviours is needed in order to examine the function of hoarding behaviours. Similarly, while there is some evidence to suggest that hoarding is associated with an unwillingness to endure unpleasant internal experiences, further research is required given that the research on EA and hoarding has revealed inconsistent findings across studies. There is some preliminary evidence to suggest that hoarding symptoms may be associated with alexithymia. However, these studies have reported differential findings and have tended to use OCD samples and OCD measures. To date there has been no published research utilising the multifaceted construct of alexithymia in relation to hoarding-specific measures. As such, research is required in this area, in order to examine the relationships between hoarding symptom dimensions and aspects of alexithymia. Finally, while there is limited research on coping strategies in relation to hoarding, there is a gap in the literature with regard to the use of specific ER strategies (e.g., expressive suppression and cognitive reappraisal) and the absence of an in-depth account of how individuals with clinically significant hoarding experience and attempt to manage their emotions. Given that the research area of ER in compulsive hoarding is relatively new, and in light of the abovementioned inconsistencies and gaps in the literature, further research is required, which is likely to have implications for the understanding and treatment of HD. To that end, the following chapter provides an overview of the current research project.
Chapter 5: The Current Research Project

As described in Chapter 4, there is a sound theoretical rationale for conceptualising hoarding behaviour using an ER framework, along with some empirical support for the role of ER difficulties in hoarding. However, this research area is relatively new and in the light of some inconsistencies found across some studies, and a lack of research on the role of other aspects of ER in hoarding, further research is required. In particular, further research is needed with regard to the relationship of hoarding to the ability to identify and describe emotions, the ability to inhibit impulsive action under conditions of positive affect, and the use of specific ER strategies (i.e., expressive suppression and cognitive reappraisal); as well as an in-depth account of how individuals with hoarding difficulties experience and attempt to manage their emotions. The current research project aims to address these areas and to contribute to the emerging base of literature on the role of ER in hoarding behaviour.

As noted, the role of ER in compulsive hoarding is a relatively new research area, and a range of constructs have been used to measure ER. However, even when studies have utilised the same measure, there have been discrepancies across findings. Indeed, there are only two published studies that have examined the DERS (Gratz & Roemer, 2004) in relation to hoarding behaviour and they have reported inconsistent findings. Fernández de la Cruz et al. (2013) found that individuals with HD (and particularly those with comorbid OCD) had higher levels of ER difficulties than did healthy controls, but the DERS was not significantly correlated with measures of hoarding. Raines et al. (2015) found that the DERS was significantly associated with the acquisition subscale and the total scale of the SI-R (Frost et al., 2004) in a non-clinical sample of individuals with elevated hoarding symptoms. Given these inconsistencies and the fact that the latter study did not explore the associations between facets of the DERS and hoarding, while the former study did not explore the symptom dimensions of hoarding in relation to ER difficulties, it is important to assess the relative importance of various aspects of ER difficulties with relation to specific hoarding behaviours. In addition, while research consistently demonstrates that impulsivity is associated with hoarding, particularly in the areas of negative urgency, lack of perseverance, and low self-control, there is a gap in the literature with regard to the role of positive urgency in relation to HD. Hence, the first aim of the current research project was to replicate and
extend previous research by investigating the relationships between multiple facets of emotion dysregulation and hoarding phenomena within the context of the existing CBT model of the disorder, and to further explore the role of emotion-based impulsivity in relation to hoarding phenomena.

As discussed in Chapter 4, there is theoretical and empirical support for the potential role of additional aspects of ER in relation to hoarding. Specifically, some features of HD (e.g., acquiring and saving behaviour) appear to be characteristic of an unwillingness to endure unpleasant internal experiences, and there is some empirical support for an association between EA and hoarding. However, there are some discrepant findings in the research with regard to this construct and HD. In addition, some features of the disorder (e.g., negative early experiences which may impact on affect development, and poor insight into symptoms) could be indicative of alexithymia, and there is some preliminary evidence to suggest that this construct may be associated with hoarding symptoms. However, the limited studies in this area have utilised OCD samples and OCD measures and have not explored a multifaceted construct of alexithymia in relation to hoarding-specific measures. While there is limited research on coping strategies in relation to hoarding, the use of specific ER strategies such as expressive suppression and cognitive reappraisal has not been assessed in relation to hoarding. Hence, the second aim of the current research project was to provide empirical support for the role of alexithymia, EA, and ER strategies in relation to hoarding phenomena. Furthermore, given the potential overlap of these measures, the research aimed to assess the respective contributions of multiple ER constructs to hoarding symptoms, and examine how particular aspects of ER might be associated with one another in the prediction of hoarding symptoms.

Finally, the research in this area to date has predominantly sought to link existing conceptualisations of ER to hoarding behaviours which has been problematic given the conceptual overlap across concepts, thereby making it difficult to disentangle the aspects most relevant to hoarding. An alternative approach of exploring the personal experiences and perceptions of individuals with HD in relation to how they experience and regulate their emotions may provide a new perspective, clarity, and direction for investigating the role of ER in hoarding. This was the third aim of the current research project.
Project Study Design

The overall research project was a mixed-methods design, comprised of two questionnaire-based studies with independent non-clinical samples, and a qualitative study with a clinical sample. The use of non-clinical samples is consistent with most studies in this area (e.g., Coles et al., 2003; Medley et al., 2013; Raines et al., 2015; Timpano et al., 2009; Timpano, Rasmussen, et al., 2013; Wheaton et al., 2011), and aligned with research that conceptualises hoarding as a dimensional construct that occurs along a continuum in both non-clinical and clinical cohorts (Coles et al., 2003; Damecour & Charron, 1998; Steketee & Frost, 2003). The use of a clinical sample was considered an important contribution of the project to provide a more thorough analysis of ER in a hoarding sample.

Study 1.

The first questionnaire-based study was a pilot investigation of emotion dysregulation and facets of impulsivity in relation to hoarding behaviour and saving cognitions. Given that some aspects of ER are likely to be more strongly related to specific hoarding behaviours than are others, Study 1 aimed to explore the relationships between six different facets of emotion dysregulation and hoarding symptoms and beliefs. While the DERS (Gratz & Roemer, 2004) contains a facet of impulse control difficulties, the items on this facet pertain to negative affect only (i.e., items have a stem of ‘when I’m upset’). Given that both positive and negative emotions play a key role in the etiological and maintenance processes of hoarding (Frost & Hartl, 1996; Frost & Steketee, 1998, 2008; Steketee & Frost, 2003, 2014b), a separate measure of impulse control was also utilised in this study in order to assess impulse control difficulties under conditions of both negative and positive affect. Negative and positive urgency are considered to be the most relevant to an ER framework, given that they represent an emotion-based disposition to rash action which reflects an underlying dysregulation in response to intense mood states (Cyders & Smith, 2007). Therefore, this study focused on these two facets of impulsivity in relation to hoarding behaviour, offering a unique contribution to the literature as the first known investigation of positive urgency and hoarding. Furthermore, it was deemed important to examine emotion dysregulation in the context of the existing predominant theoretical model of hoarding (i.e., the CBT model), and the way in which ER difficulties may relate not only to symptoms, but also
to cognitive factors that contribute to symptoms. As such, the role of beliefs was examined in the ER-hoarding relationship.

**Study 2.**

The second questionnaire-based study was designed to address three aims. Firstly, this study aimed to replicate the findings from Study 1 in an independent non-clinical sample. Secondly, this study aimed to investigate the relationships between hoarding phenomena and additional constructs of ER, namely EA, alexithymia, expressive suppression and cognitive reappraisal. Finally, this study aimed to analyse the respective contributions of multiple ER facets in the prediction of hoarding, and investigate how some of these ER constructs may be related to one another in predicting hoarding symptoms.

**Study 3.**

To expand on the findings from the first two studies, Study 3 was designed as a pilot investigation of ER in a clinical hoarding sample. This study aimed to explore how individuals with clinically significant hoarding symptoms experience and understand their emotions, their efforts at regulating their emotions, and how aspects of their hoarding behaviour might serve an emotion regulatory function. As such, Study 3 was predominantly qualitative in nature, utilising in-depth interviews to provide a rich and detailed understanding of individuals’ experiences and perceptions. The quantitative measures from Study 2 were also administered and compared to an age-matched sample from Study 2 via \( t \)-tests.

**Summary**

In order to better understand the function of specific hoarding symptoms, it is important to investigate how various aspects of ER are implicated in hoarding, along with obtaining an understanding of how individuals with the disorder experience, understand, and regulate their own emotions. The current project was designed with these aims in mind. The three studies of the current research project are addressed sequentially in the following three chapters.
Chapter 6. Study 1: A Pilot Investigation of Emotion Regulation Difficulties and Hoarding Phenomena

Study 1 was designed as an exploratory investigation of the relationship between hoarding phenomena and multiple facets of emotion dysregulation. As noted previously, the DERS (Gratz & Roemer, 2004) has received limited attention in relation to hoarding, and investigating the differential associations between features of emotion dysregulation and the core psychopathology of HD is important in order to better understand the function of specific hoarding behaviours. It is likely that some aspects of ER will be more strongly related to some specific hoarding behaviours than to others. For example, impulse control difficulties may be more relevant to acquiring behaviour than to clutter, and non-acceptance of emotions may be more relevant to discarding than to acquiring. As such, Study 1 aimed to explore the relationships between six different facets of emotion dysregulation and hoarding symptoms and beliefs.

The aspect of emotion dysregulation pertaining to impulse control difficulties was further explored in the current study, given that the items on the impulse control facet of the DERS (Gratz & Roemer, 2004) refer to negative affect only (i.e., items have a stem of ‘when I’m upset’). As both positive and negative emotions play a key role in the etiological and maintenance processes of hoarding (Frost & Hartl, 1996; Frost & Steketee, 1998, 2008; Steketee & Frost, 2003, 2014b) and previous research suggests that excessive acquisition is motivated by both positive and negative emotional states (e.g., Grisham et al., 2011; Mueller et al., 2009; Steketee & Tolin, 2011; A. D. Williams & Grisham, 2012), it is important to consider the role of positive urgency in relation to hoarding behaviour. As such, a separate measure of impulse control (i.e., UPPS-P; Lynam et al., 2007) was also utilised in this study in order to assess impulse control difficulties under conditions of both negative and positive affect. As negative and positive urgency represent a mood-based disposition to rash action which reflects an underlying dysregulation in response to intense mood states (Cyders & Smith, 2007), these two facets of impulsivity are considered to be the most relevant to an ER framework. Therefore, this study aimed to investigate only these two facets of the UPPS-P in relation to hoarding behaviour.

While ER difficulties are likely to be directly associated with hoarding symptoms, they may also relate to other factors that in turn contribute to symptoms.
Given the prominent role of cognitions in the etiology and maintenance of hoarding, further research is required on the role of beliefs in the ER-hoarding relationship. As such, Study 1 also aimed to investigate the indirect effect of ER difficulties to hoarding symptoms via saving beliefs. More specifically, beliefs about emotional attachment to possessions are likely to be most relevant in the ER-hoarding relationship, given that these beliefs are inherently associated with emotions and that possessions may be relied upon as a form of ER (Phung et al., 2015). As such, the mediating role of emotional attachment beliefs in the ER-hoarding relationship was investigated.

As noted in Chapter 4, along with the empirical research which overall suggests a relationship between hoarding, ER difficulties, and impulsivity, there are several theoretical reasons for why these ER variables might be implicated in hoarding. With regard to the DERS (Gratz & Roemer, 2004), difficulties with engaging in goal-directed behaviour may be reflected in problems with tasks such as sorting, organising, and discarding, while symptoms of compulsive acquiring appear to be indicative of impulse control difficulties. Furthermore, the features of hoarding pertaining to strong emotional reactions and avoidance of distress appear to be indicative of general emotion dysregulation, and more specifically, may reflect facets of non-acceptance of emotions and/or a lack of access to effective ER strategies. Indeed, individuals with greater difficulties regulating their emotions (or who hold beliefs that they cannot tolerate negative emotions or that they do not have effective ways of managing their emotions) are likely to utilise maladaptive or avoidance-based strategies in order to alleviate negative emotional states. Hoarding behaviours (e.g., acquiring, saving) may in themselves represent direct maladaptive attempts to regulate emotion, or they may be the result of maladaptive beliefs that have developed from underlying ER deficits. That is, perhaps in the presence of ER difficulties, individuals with a propensity toward hoarding use their possessions as a form of ER to achieve positive emotional states and alleviate negative ones, which over time fosters the formation of strong emotional attachments to, and mistaken beliefs about, the need for possessions (Phung et al., 2015). In turn, these distorted cognitions and behaviours lead to pathological hoarding behaviours (i.e., excessive acquiring, clutter, and difficulty discarding). Emotional attachment beliefs in particular may be associated with emotion dysregulation as possessions may be relied upon to soothe distress.
With regard to the UPPS-P (Lynam et al., 2007), impulse control difficulties under various mood states are likely to be implicated in hoarding behaviour in several ways. That is, when individuals with HD experience distress, negative urgency may lead to the need to act, perhaps by provoking increased acquisition, impulsive avoidance of discarding, and impulsive abandonment of sorting/organising tasks, all of which contribute to hoarding severity (Phung et al., 2015). When experiencing positive feelings, positive urgency will likely provoke individuals with HD to engage in increased acquiring behaviour, and will impact on their ability to control their impulses to acquire. Similarly, the handling of possessions during sorting through and organising clutter can elicit positive emotions associated with the objects themselves (such as pleasure, excitement, and joy), along with positive feelings relating to identity, attachment, and responsibility and resourcefulness. As such, positive urgency may prompt individuals with HD to prolong the handling experience and may also lead to the impulsive abandonment of their efforts to sort or discard in favour of prolonging a positive mood state, which will ultimately contribute to hoarding severity.

In summary, Study 1 aimed to explore six facets of emotion dysregulation, with the facet of impulse control difficulties being separately investigated under conditions of positive and negative affect, in relation to hoarding phenomena in a non-clinical sample. Furthermore, this study examined the role of emotional attachment beliefs in the relationship between emotion dysregulation and hoarding.

The hypotheses for Study 1 were:

1. ER difficulties (i.e., DERS total) would be positively correlated with hoarding symptoms and with hoarding beliefs.

   Given the exploratory nature of this study and that there was no published research on the DERS and hoarding at the time, it was hypothesized that all six facets of emotion dysregulation would be positively associated with hoarding symptoms, in consideration of the theoretical conceptualisations outlined previously. It was hypothesized that these associations would be stronger for the acquisition and difficulty discarding subscales than for the clutter subscale.

2. Negative and positive urgency would be positively correlated with hoarding symptoms and with hoarding beliefs.
3. The ER factors in hypotheses 1 and 2 would remain significantly associated with hoarding symptoms after controlling for symptoms of depression and non-hoarding obsessive-compulsive symptoms.
4. The relationship between ER difficulties and hoarding symptoms would be mediated through emotional attachment beliefs.

Method

Participants

Participants for Study 1 were recruited through a larger study being completed by third year psychology students from an Australian university as part of their personality unit. The larger study included a number of personality measures from historically divergent psychological paradigms (e.g., descriptive, psychodynamic, social-learning, biological, self-regulation), along with measures of psychological distress, OCD, and hoarding-related phenomena. Students were provided with a link to complete the online study as part of the laboratory report requirement for their course, which involved examining personality dimensions as they relate to OCD phenomena. Students were also asked to invite two people not enrolled in the course from a different gender and generation to complete the online survey. One participant was excluded from the study due to invariable responding across all measures. The final sample (\( N = 199 \)) comprised 142 females and 57 males ranging in age from 18 – 66. The overall mean sample age was 28.43 (\( SD = 11.42 \)), with a mean age of 27.49 (\( SD = 10.59 \)) for females, and 30.80 (\( SD = 13.10 \)) for males.

The vast majority of participants (85.9%, \( n = 171 \)) were born in Australia or New Zealand, while the remainder were born in Asia (4%, \( n = 8 \)), Europe (6%, \( n = 12 \)), North America (1%, \( n = 2 \)), South America (0.5%, \( n = 1 \)), and Africa (1.5%, \( n = 3 \)). There was one missing value on this question and one participant selected ‘other’ on this question. The majority of participants (89.5%, \( n = 178 \)) reported that they had lived in Australia for 18 years or over (range = 18 – 61), while 6.5% of the sample (\( n = 13 \)) had lived in Australia for between 6 and 17 years, and 4% of the sample (\( n = 8 \)) had lived in Australia for between 0 and 5 years. English was the main language spoken at home for the majority of participants (95%, \( n = 189 \)).
In terms of the highest level of education achieved by participants, 52.3% of the sample \((n = 104)\) reported having a tertiary education, 35.7% \((n = 71)\) reported having a high school education, and 12% \((n = 24)\) reported having vocational training. The vast majority of participants \((80.4\%, n = 160)\) were current university students. In terms of employment status, 23.1% of the sample \((n = 46)\) were employed in full time work, 27.6% \((n = 55)\) were employed in part time work, 34.7% \((n = 69)\) were employed in casual work, and 14.6% \((n = 29)\) were unemployed. With regard to marital status, 38.7% of the respondents \((n = 77)\) identified as single, 37.7% \((n = 75)\) were involved in a committed relationship, and 23.6% \((n = 47)\) were married or involved in a de-facto relationship.

Materials and Procedure

The research protocol was approved by the university’s human research ethics committee (SUHREC Project 2012/004). The measures for this study were uploaded to online survey software “Opinio” which enables users to produce, manage, and publish online questionnaires using a web browser. Participants provided informed consent to participate in the study by clicking a button to indicate that they had read and understood the Consent Information Statement presented on the first page, prior to starting the first measure. The online survey included a series of demographic questions, followed by a number of self-report measures of personality, psychological distress, obsessive-compulsive symptoms, and hoarding cognitions and behaviour. Only those measures relevant to the aims of the current study are detailed below. A Debriefing Statement was provided at the end of the survey. Please see Appendix A for a copy of the Ethics Clearance, Consent Information Statement, Debriefing Statement, and all relevant measures for Study 1.

Demographics.

Information about the demographic background of the participants was obtained through nine questions regarding age, gender, country of birth, years lived in Australia, language spoken at home, marital status, highest level of education achieved, student status, and employment status.
Psychological distress.

The Depression, Anxiety and Stress Scales 21 (DASS-21; Lovibond & Lovibond, 1995) is a 21-item self-report measure designed to assess the negative emotional states of depression (dysphoria, hopeless, self-deprecation, anhedonia), anxiety (autonomic arousal, skeletal muscle effects, subjective experience of anxious affect), and stress (chronic non-specific arousal, feeling easily upset, irritable, and impatient). Each scale consists of seven items, for example “I couldn’t seem to experience any positive feelings at all” (depression); “I felt I was close to panic” (anxiety); and “I found it hard to wind down” (stress). Participants are asked to rate the extent to which they have experienced each state over the past week using a 4-point Likert-type scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). Scores for the three scales are calculated by summing the scores of the seven items in each scale. Lovibond and Lovibond (1995) suggest that doubling the scores of the DASS-21 scales is equivalent to deriving scores from the full version of the DASS and allows for scores to be compared to the DASS normative data. As such, the scores on each scale range from 0 to 42, with higher scores indicating more severe levels of depression, anxiety, and stress.

The DASS-21 was chosen for inclusion in the current study as it offers several advantages over the full 42-item version: it takes half the time to complete, while still providing similar results to the full length version, and has acceptable reliability and the same factor structure as the full DASS (Antony, Bieling, Cox, Enns, & Swinson, 1998; Clara, Cox, & Enns, 2001; Henry & Crawford, 2005; Lovibond & Lovibond, 1995). The three-factor structure of the DASS-21 has been confirmed in both clinical and non-clinical samples, and the three scales have demonstrated adequate internal consistency, test-retest reliability, and convergent and discriminant validity (Antony et al., 1998; Clara et al., 2001; Henry & Crawford, 2005; Lovibond & Lovibond, 1995).

In the current study, all three scales of the DASS-21 demonstrated good to excellent internal consistency. Cronbach’s alphas were .93 for the depression scale, .86 for the anxiety scale, and .87 for the stress scale. For the purposes of this study, the depression scale was used in hierarchical multiple regression analyses as a control variable for depressive symptoms.
Obsessive-compulsive symptoms.

The Obsessive-Compulsive Inventory Revised (OCI-R; Foa et al., 2002) is a revised shorter version of the original Obsessive-Compulsive Inventory (OCI; Foa, Kozak, Salkovskis, Coles, & Amir, 1998) that assesses symptoms of OCD. It consists of 18 items that load onto six subscales: (a) washing (e.g., “I wash my hands more often and longer than necessary”); (b) obsessing (e.g., “I find it difficult to control my own thoughts”); (c) hoarding (e.g., “I collect things I don’t need”); (d) ordering (e.g., “I get upset if objects are not arranged properly”); (e) checking (e.g., “I repeatedly check doors, windows, drawers, etc.”); and (f) mental neutralizing (e.g., “I feel compelled to count while I am doing things”). Participants are asked to rate how much each symptom has distressed or bothered them during the past month using a 5-point Likert-type scale ranging from 0 (not at all) to 4 (extremely). Scores are generated by summing the item scores, with higher scores representing higher levels of OCD symptoms.

The OCI-R was selected for inclusion in the current study as it takes less time to administer, has a simplified scoring method, and has less overlap between subscales when compared with the original OCI (Foa et al., 2002). The authors of the scale have reported the OCI-R to have good psychometric properties, similar to those found for the original measure. Confirmatory factor analytic studies have confirmed the six-factor structure of the OCI-R in clinical (Abramowitz & Deacon, 2006; Huppert et al., 2007), non-clinical (Hajcak, Huppert, Simons, & Foa, 2004), and mixed samples (Foa et al., 2002). Internal consistency has been found to be high for the total and subscales scores across clinical and non-anxious samples, except for the mental neutralizing subscale in non-anxious controls (Foa et al., 2002). In a college sample the total scale and washing, checking, ordering, and obsessing subscales demonstrated excellent internal consistency, with moderate-to-good internal consistency found for the hoarding and mental neutralizing subscales (Hajcak et al., 2004). Test-retest reliability for the total and subscale scores has been found to be excellent for clinical samples and good-to-excellent in non-clinical samples (Foa et al., 2002; Hajcak et al., 2004). The OCI-R has demonstrated adequate convergent validity, strongly correlating with another self-report measure (i.e., the Maudsley Obsessive-Compulsive Inventory), and moderately correlating with observer ratings of OCD severity (Foa et al., 2002). In a college sample the OCI-R was found to have moderate-to-excellent convergent validity with other obsessive-compulsive measures, and good divergent validity with measures of
depression and worry (Hajcak et al., 2004). The OCI-R has been found to discriminate between OCD patients and other anxiety disorders (Abramowitz & Deacon, 2006; Foa et al., 2002), and the subscales of the OCI-R have been found to be a valid measure of six symptom subtypes of OCD in an OCD sample (Huppert et al., 2007).

In the current study, the OCI-R demonstrated acceptable to good internal consistency for the total scale ($\alpha = .89$), washing subscale ($\alpha = .71$), obsessing subscale ($\alpha = .89$), hoarding subscale ($\alpha = .79$), ordering subscale ($\alpha = .88$), checking subscale ($\alpha = .81$), and mental neutralizing subscale ($\alpha = .70$). A non-hoarding obsessive-compulsive symptom variable (OCIR-NH) was created for the current study by calculating the sum of all items excluding those from the hoarding subscale. This variable demonstrated good reliability ($\alpha = .89$) and was used in hierarchical multiple regression analyses as a control variable for non-hoarding obsessive-compulsive symptoms.

**Hoarding symptoms.**

*The Saving Inventory – Revised* (SI-R; Frost et al., 2004) is a 23-item self-report measure designed to assess the three major features of hoarding as defined by Frost and Hartl (1996): excessive acquisition of possessions, difficulty discarding possessions, and excessive clutter. This scale measures the three key symptoms as well as the distress and interference caused by these symptoms using a 4-point Likert-type scale. Items are summed to produce a total score and three subscale scores: (a) difficulty discarding (e.g., “How often do you decide to keep things you do not need and have little space for?”); (b) excessive clutter (e.g., “How much of your home is difficult to walk through because of clutter?”), and (c) excessive acquisition (e.g., “How much control do you have over your urges to acquire possessions?”). Higher scores represent higher levels of hoarding symptoms and severity.

The SI-R demonstrates good psychometric properties. Frost et al. (2004) conducted a factor analysis of the SI-R with a hoarding sample which validated the three-factor structure and found strong internal consistency for the total scale ($\alpha = .92$) and acceptable internal consistency for the subscales (difficulty discarding $\alpha = .80$; excessive clutter $\alpha = .82$; excessive acquisition $\alpha = .73$). The SI-R has also demonstrated very good test-retest reliability in a small sample of hoarding participants, and the total and subscale scores have been found to differentiate between self-
identified hoarding participants, OCD participants without hoarding, and community controls (Frost et al., 2004). This measure has demonstrated good convergent validity, with the SI-R total score and the difficulty discarding and excessive clutter subscales correlating strongly with another self-report measure (i.e., the Savings Cognitions Inventory), as well as with observational measures of clutter in the home (Frost et al., 2004). In the current study the SI-R demonstrated high internal consistency for the total scale ($\alpha = .92$) and good to high internal consistency for the subscales (excessive clutter $\alpha = .88$, difficulty discarding $\alpha = .90$, excessive acquisition $\alpha = .82$).

*The Saving Cognitions Inventory* (SCI; Steketee et al., 2003) is a 24-item self-report measure of the beliefs underpinning Frost & Hartl’s (1996) model of hoarding, namely: beliefs about possessions as memory aids, sense of responsibility for possessions, emotional attachment to possessions, and the need for control over possessions. Participants are asked to rate the extent to which they had each thought when deciding whether to throw something away over the past week, using a 7-point Likert-type scale ranging from 1 (*not at all*) to 7 (*very much*). Items are summed to produce a total score and four subscale scores: (a) emotional attachment to possessions (e.g., *“Losing this possession is like losing a friend”*); (b) memory for possessions (e.g., *“Saving this means I don’t have to rely on my memory”*); (c) control over possessions (e.g., *“No one has the right to touch my possessions”*); and (d) responsibility for possessions (e.g., *“Throwing this away means wasting a valuable opportunity”*).

Steketee et al. (2003) conducted a factor analysis on the SCI using a small sample of individuals with hoarding problems, which revealed four hoarding belief factors with very good to high internal consistencies ($\alpha = .95$ for emotional attachment, $\alpha = .89$ for memory, $\alpha = .86$ for control, $\alpha = .90$ for responsibility, and $\alpha = .96$ for the total scale). The total SCI score and four subscales distinguished individuals with hoarding from individuals with OCD without hoarding, and controls, and demonstrated adequate convergent and discriminant validity (Steketee et al., 2003). In the current study excellent internal consistency was found for the total scale ($\alpha = .93$) and the emotional attachment subscale ($\alpha = .92$), while the other subscales had adequate reliabilities ($\alpha = .70$ for the Control subscale; $\alpha = .79$ for the Responsibility subscale; and $\alpha = .78$ for the Memory subscale). For the purposes of this study, the total SCI variable and emotional attachment subscale were variables of interest.
Emotion regulation.

The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a 36-item self-report measure assessing ER and dysregulation. The DERS measures six areas of difficulty in ER: (a) non-acceptance of emotional responses (“When I’m upset, I feel guilty for feeling that way”); (b) difficulties engaging in goal-directed behaviour when experiencing negative emotions (“When I’m upset, I have difficulty getting work done”); (c) impulse control difficulties (“When I’m upset, I lose control over my behaviors”); (d) lack of emotional awareness (“I pay attention to how I feel” [reverse-scored]); (e) limited access to ER strategies perceived as effective (“When I’m upset, it takes me a long time to feel better”); and (f) lack of emotional clarity (“I have no idea how I am feeling”). Participants rate how often each item applies to them using a 5-point Likert-type scale: 1 (almost never; 0-10%); 2 (sometimes; 11-35%); 3 (about half the time; 36-65%); 4 (most of the time; 66-90%), and 5 (almost always; 91-100%).

There are eleven reverse-scored items, six of which make up the lack of emotional awareness subscale. Subscale scores are obtained by summing the corresponding items, with higher scores reflecting more difficulty in regulating emotions (i.e., greater emotion dysregulation).

An initial exploratory factor analysis on the DERS revealed six different, although related factors which reflected the proposed multifaceted definition of ER (Gratz & Roemer, 2004). The six-factor structure has been confirmed in community adolescent samples (Neumann et al., 2010; Weinberg & Klonsky, 2009), and has also been found to adequately fit the data in an adolescent inpatient sample, with most items loading strongly on their respective latent factor (Perez et al., 2012). Translated versions of the DERS (e.g., Turkish, Greek, Italian, and French) have also confirmed the six-factor structure (Dan-Glauser & Scherer, 2013; Giromini et al., 2012; Mitsopoulou et al., 2013; Sarıtaş-Atalar et al., 2015). However, several studies have not replicated the six-factor structure (e.g., Cho & Hong, 2013; Tejeda et al., 2012), with some researchers suggesting that the emotional awareness facet may not represent the same higher-order construct as the other five facets (Bardeen et al., 2012). While another study established that the five and six-factor model of the DERS exhibited equivalent fit indices in a sample of adults with severe mental illness (Fowler et al., 2014), recent research has raised concerns about the psychometric limitations of the DERS,
identifying a method effect for the lack of awareness facet and suggesting that a total score comprised of the reverse-scored awareness items may not be appropriate (Bardeen et al., 2016; Lee et al., 2016).

The DERS demonstrates good construct validity as it is associated with theoretically-related ER measures such as EA (Fowler et al., 2014; Gratz & Roemer, 2004). Adequate convergent and discriminant validity has been found for the total scale as it correlates positively with measures of anxiety and depression (Fowler et al., 2014; Roemer et al., 2009), and negatively with psychological measures such as mindfulness and self-compassion (Roemer et al., 2009). The DERS has been significantly associated with behavioural outcomes such as deliberate self-harm, frequency of partner abuse, drug use, alcohol use and alcohol-related consequences, adolescents’ externalising problems (i.e., aggressive behaviour and delinquent behaviour), internalizing problems (i.e., anxiety and depression), borderline personality symptoms, eating disorders, and pathological gambling (Dvorak et al., 2014; Gratz & Roemer, 2004; Iverson et al., 2012; Lavender et al., 2014; Neumann et al., 2010; Perez et al., 2012; Weinberg & Klonsky, 2009; A. D. Williams et al., 2012).

The total scale and six subscales of the DERS have demonstrated adequate-to-high internal consistency in both clinical (e.g., Fowler et al., 2014; Fox, Axelrod, Paliwal, Sleeper, & Sinha, 2007; Gratz, Rosenthal, Tull, Lejuez, & Gunderson, 2006; Perez et al., 2012; Roemer et al., 2009) and non-clinical samples (e.g., Gratz & Roemer, 2004; Neumann et al., 2010; Staples & Mohlman, 2012), and the overall scale and six subscales exhibits similar psychometric properties across men and women and diverse racial groups such Caucasian, Asian American, and African American (Ritschel, Tone, Schoemann, & Lim, 2015). Test-retest reliability for the DERS total has been found to be good over a two-month period in a clinical sample and good over a 4-8 week time period in a non-clinical sample (Gratz & Roemer, 2004). In the current study, good-to-high internal consistency was found for all six subscales and the total scale: lack of emotional awareness ($\alpha = .83$); lack of emotional clarity ($\alpha = .83$); non-acceptance of emotional responses ($\alpha = .92$); difficulties engaging in goal-directed behaviour ($\alpha = .88$); impulse control difficulties ($\alpha = .89$); limited access to ER strategies ($\alpha = .93$); and the total scale ($\alpha = .95$).
The UPPS-P Impulsive Behavior Scale (UPPS-P; Lynam et al., 2007) is a 59-item self-report measure assessing five personality pathways to impulsive behaviour: (a) negative urgency, (b) (lack of) perseverance, (c) (lack of) premeditation, (d) sensation seeking, and (e) positive urgency. The first pathway, negative urgency, refers to an individual’s tendency to give in to strong impulses when experiencing negative emotions such as depression, anxiety, or anger (e.g., “When I am upset I often act without thinking”). Perseverance assesses an individual’s level of ability to maintain vigilant attention on a task despite boredom and/or fatigue (e.g., “I tend to give up easily”). Premeditation measures an individual’s ability to think through the potential consequences of his or her behaviour before acting (e.g., “I like to stop and think things over before I do them”). Sensation seeking assesses an individual’s preference for stimulation and excitement (e.g., “I would enjoy parachute jumping”). The final pathway, positive urgency, refers to the tendency to act rashly when experiencing high positive affect (e.g., “I tend to lose control when I am in a great mood”). Participants are asked to respond to items using a 4-point Likert-type scale ranging from 1 (strongly agree) to 4 (strongly disagree). The authors of the scale recommend calculating a mean of the items for each subscale to put the scales on the same metric. High scores indicate more impulsive behaviour for all subscales.

Whiteside and Lynam (2001) developed the original UPPS Impulsive Behavior Scale through factor analysing a large set of established self-report measures of impulsivity. Four separate but related factors were identified, each of which loaded onto three different facets of the five-factor model of personality as measured by the NEO-PI-R (Costa & McCrae, 1995). Lack of premeditation and lack of perseverance loaded negatively onto a factor that included facets of conscientiousness; factor 2 was comprised of sensation seeking and facets of extraversion; and the third factor encompassed (negative) urgency and facets of neuroticism (Whiteside & Lynam, 2001). The UPPS was later extended to include the Positive Urgency Measure (PUM; Cyders et al., 2007) and renamed the UPPS-P (Lynam et al., 2007).

Subsequent research has established that the UPPS-P measures five distinct, albeit related, first-order factors, that are represented by three second-order factors: an emotion-based disposition to rash action (comprised of facets of positive and negative urgency), a deficits-in-conscientiousness disposition to rash action (comprised of facets of lack of premeditation and lack of perseverance), and a sensation seeking disposition...
to rash action (Cyders & Smith, 2007). The five factors have demonstrated good convergent validity across assessment method (i.e., questionnaire and interview method), and good discriminant validity within self-report assessment methods (Cyders & Smith, 2007; G. T. Smith et al., 2007). Research suggests that the UPPS-P is a valid and reliable measure of impulsivity for both males and females (Cyders, 2013). Internal consistencies for the five factors have ranged from .83 to .94 with test-retest reliabilities over a three-month period ranging from .62 to .81 (Cyders & Smith, 2008a). In the current study good to high internal consistency was found for each factor: negative urgency ($\alpha = .87$), lack of premeditation ($\alpha = .84$), lack of perseverance ($\alpha = .83$), sensation seeking ($\alpha = .90$), and positive urgency ($\alpha = .93$). For the purposes of the current study, the two facets of the emotion-based disposition factor (i.e., positive and negative urgency) were variables of interest.

Results

Overview of Data Analyses

Data was analysed using the IBM Statistical Package for the Social Sciences (SPSS) 21. The data was initially screened for missing values and out of range scores. Given that some research has failed to confirm the six-factor structure of the DERS and raised questions about the lack of emotional awareness factor (e.g., Bardeen et al., 2012; Cho & Hong, 2013; Lee et al., 2016; Tejeda et al., 2012), an exploratory factor analysis was conducted to assess the factor structure of the DERS in the current sample. Assumption testing was performed prior to all statistical analyses. Descriptive statistics were calculated for all variables of interest and correlational analyses were performed to explore the relationships between ER difficulties, negative and positive urgency, and hoarding-related phenomena. A series of hierarchical multiple regression analyses were conducted to test the ability of these ER constructs to predict hoarding symptoms after controlling for relevant covariates (i.e., depressive and non-hoarding obsessive-compulsive symptoms). Finally, a mediation analysis was performed to test the role of emotional attachment beliefs in the ER-hoarding relationship.

Data Screening

Prior to statistical analyses, descriptive statistics and frequency tables were
produced and examined for missing values, correct minimum and maximum values, and out of range scores. There were three missing values for demographic information. As these demographic variables were included for descriptive purposes only and were not used in statistical analyses, these missing values were deemed inconsequential. There were no missing values for any of the questionnaire data. All data were in the expected range on these variables.

**Exploratory Factor Analysis**

In light of previous research questioning the factor structure of the DERS, it was considered important to assess the factor structure of the scale in the current study. The 36 items of the DERS were subjected to a principal components analysis (PCA) using SPSS 21. In line with original research suggesting that the DERS is comprised of six correlated subscales (Gratz & Roemer, 2004) an oblique (oblimin) rotation was used and the number of factors extracted was set at six.

Prior to performing PCA, the suitability of data for factor analysis was assessed. Although there is some debate in the literature about adequate sample size and ratio of participants to items required for factor analysis, a sample size of at least 150 or a ratio of 5 cases for each item is usually deemed adequate (see discussion in Tabachnick & Fidell, 2013). The current sample size of 199 meets this requirement. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The KMO obtained was .92 and Bartlett’s Test of Sphericity was significant (p<.001), supporting the factorability of the correlation matrix.

Using Kaiser’s criterion, the first six components recorded eigenvalues above 1, and collectively explained a total of 69.83% of the variance. Inspection of the scree plot however revealed a clear break between the second and the third component, demonstrating that component 1 and 2 captured much more of the variance (53.52%) than the remaining components. There was also a break between the third and fourth components (see Figure B1 in Appendix B for a copy of scree plot). Inspection of the component matrix revealed that most items loaded strongly (above .4) on the first two components. Apart from one item (item 20), all items on components 3, 4, 5, and 6 loaded more strongly on either component 1 or 2.

Inspection of the rotated six-factor solution in the pattern matrix showed eleven items loading above .4 on Component 1, five items on Component 2, six items on
Component 3, five items on Component 4, four items on Component 5, and five items on Component 6. However, on closer inspection the items falling on the six components did not correspond with the theoretical factors. Most components contained a mix of items from different subscales, with only the items from the non-acceptance of emotional responses subscale loading onto its theoretical factor (see Table B1 in Appendix B).

As the six-factor solution for the DERS in the current study did not correspond fully with the six theorized factors, further tests were conducted to ascertain the number of factors to be retained. A Very Simple Structure (VSS) test was run in R 3.0.2 using all 36 DERS items, which recommended retaining four factors. A parallel analysis was also conducted using the program Monte Carlo PCA for Parallel Analysis in SPSS, with results suggesting that three factors be retained. However, subsequent PCA with oblimin rotation extracting three and four factors revealed that most items loaded more strongly on Component 1 or 2, and neither the rotated three- or four-factor solutions reflected the any of the theoretical factors accurately.

Overall these results suggested that a two-factor solution for the DERS in the current sample might be more appropriate. As such, a PCA with oblimin rotation was conducted in SPSS extracting two factors. The two-factor solution explained 53.52% of the variance, with Component 1 contributing 41.06% and Component 2 contributing 12.46%. Inspection of the rotated two-factor solution showed that Component 2 was comprised entirely of reverse-scored items, including all six items from the lack of emotional awareness factor plus four other reverse-scored items (see Table B2 in Appendix B for the pattern and structure matrix for the two-factor solution). Given that these four reverse-scored items also loaded onto Component 1, and in line with previous research suggesting that the lack of emotional awareness subscale may not represent the same higher-order ER construct as the other factors (e.g., Bardeen et al., 2012; Lee et al., 2016) it was decided to create a total variable excluding the lack of awareness items, hereafter known as DERS Total Minus Awareness (MA)\(^1\). This variable demonstrated excellent internal consistency (\(\alpha = .96\)).

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\(^1\) A factor analysis was also performed using Principal Axis Factoring (PAF) on the 36 items of the DERS which revealed a similar pattern of results. Removing the six items of the lack of awareness subscale and subjecting the 30 items of the DERS to PCA and PAF also did not result in items falling in their theoretical factors.
Assumption Testing

Normality was initially assessed via histograms, box plots, and normal probability plots, along with skewness and kurtosis ratios (using a critical value of 3.29). Univariate outliers were also assessed through histograms, box plots, most extreme values, and z scores for each variable, particularly noting z scores above the $\alpha = .001$ significance level of 3.29 (Tabachnick & Fidell, 2013). Using these statistical methods, many variables in the current study demonstrated violations of normality and had univariate outliers. Most variables were positively skewed, reflecting a concentration of low scores, which is expected for a non-clinical sample. As displayed in Table 1, skewed variables were transformed via either a square root or logarithm transformation, after which all variables met the assumption of normality, with the exception of the emotional attachment subscale of the SCI. However, this variable was retained for the mediation analysis given that after transformation there were no univariate outliers and the residual plots did not reveal any violation of assumptions. Furthermore, a bootstrapping procedure was utilised for the mediation analysis (MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2008) which does not rely on the assumption of normality. Age could not be used as a control variable in the current study due to a non-normal distribution and univariate outliers even after transformation, and residual plots that were indicative of violations of the assumptions for regression. As shown in Table 1, the transformed variables were used for all data analyses, with the exception of the raw variable for negative urgency as it did not violate any assumptions.
Table 1

*Transformations for Study 1 Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Violation</th>
<th>Transformation Performed</th>
<th>Assumption Met</th>
<th>Variable Used in Analyses</th>
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<td>LG10</td>
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<td>Transformed</td>
</tr>
</tbody>
</table>

*Note:* Pos Skew = positively skewed; SQRT = square root transformation; LG10 = logarithm 10 transformation; DASS-21 Dep = Depression subscale of the Depression, Anxiety, and Stress Scales-21; OCIR-NH = Obsessive Compulsive Inventory Revised Non-Hoarding variable; SI-R = Savings Inventory Revised; Clutter = Excessive Clutter; Acquisition = Excessive Acquisition; Discarding = Difficulty Discarding; SCI = Saving Cognitions Inventory; EmAttach = Emotional Attachment to Possessions; DERS Tot (MA) = Difficulties in Emotion Regulation Scale Total Minus Awareness subscale; UPPS-P = UPPS-P Impulsive Behavior Scale; NU = Negative Urgency; PU = Positive Urgency.

**Descriptive Data**

Means and standard deviations, as well as the observed and possible ranges for each of the variables in Study 1 are presented in Table 2. The mean scores and range on all measures in the current study were consistent with previous research using non-clinical samples (e.g., Bardeen et al., 2012; Cyders, 2013; Frost et al., 2004; Hajcak et al., 2004; Phung et al., 2015; Steketee & Frost, 2014b; Steketee et al., 2003; Timpano et al., 2009; A. D. Williams & Grisham, 2012).
Table 2
Study 1 Means, Standard Deviations, and Scale Ranges for all Variables of Interest

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>Observed Range</th>
<th>Possible Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hoarding Symptoms and Beliefs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SI-R Total</td>
<td>18.72</td>
<td>11.51</td>
<td>0-58</td>
<td>0-92</td>
</tr>
<tr>
<td>SI-R Clutter</td>
<td>5.24</td>
<td>4.91</td>
<td>0-26</td>
<td>0-36</td>
</tr>
<tr>
<td>SI-R Acquisition</td>
<td>6.16</td>
<td>3.98</td>
<td>0-21</td>
<td>0-28</td>
</tr>
<tr>
<td>SI-R Discarding</td>
<td>7.32</td>
<td>5.15</td>
<td>0-23</td>
<td>0-28</td>
</tr>
<tr>
<td>SCI Total</td>
<td>49.45</td>
<td>21.26</td>
<td>24-121</td>
<td>24-168</td>
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<tr>
<td>SCI EmAttach</td>
<td>18.27</td>
<td>10.13</td>
<td>10-54</td>
<td>10-70</td>
</tr>
<tr>
<td>Psychological Distress</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DASS-21 Depression</td>
<td>7.77</td>
<td>9.46</td>
<td>0-42</td>
<td>0-42</td>
</tr>
<tr>
<td>OC Symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCIR-NH</td>
<td>9.23</td>
<td>8.44</td>
<td>0-43</td>
<td>0-60</td>
</tr>
<tr>
<td>Emotion Regulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DERS Total (MA)</td>
<td>64.42</td>
<td>22.78</td>
<td>30-140</td>
<td>30-150</td>
</tr>
<tr>
<td>UPPS-P NU</td>
<td>2.24</td>
<td>0.55</td>
<td>1.08-4.00</td>
<td>1-4</td>
</tr>
<tr>
<td>UPPS-P PU</td>
<td>1.68</td>
<td>0.51</td>
<td>1.00-3.71</td>
<td>1-4</td>
</tr>
</tbody>
</table>

Note: N=199
SI-R=Savings Inventory Revised; Clutter=Excessive Clutter; Acquisition=Excessive Acquisition; Discarding=Difficulty Discarding; SCI=Saving Cognitions Inventory; EmAttach=Emotional Attachment to Possessions; DASS-21=Depression, Anxiety, and Stress Scales; OC Symptoms=Obsessive-Compulsive Symptoms; OCIR-NH=Obsessive Compulsive Inventory Revised Non-Hoarding variable; DERS Total (MA)=Difficulties in Emotion Regulation Scale Total Minus Awareness subscale; UPPS-P=UPPS-P Impulsive Behavior Scale; NU=Negative Urgency; PU=Positive Urgency.

Emotion Regulation Difficulties and Hoarding

Pearson’s correlations were performed to explore the association between ER difficulties and hoarding-related phenomena. As displayed in Table 3, a moderate positive correlation was found between ER difficulties, as measured by DERS total (MA), and hoarding symptoms, as measured by the SI-R total. The difficulty discarding and acquisition subscales of the SI-R were moderately positively associated with ER difficulties, while the clutter subscale had a weaker positive association with DERS total (MA). Emotion regulation difficulties were also moderately positively associated with hoarding beliefs, as measured by the SCI total, and the emotional attachment to possessions subscale. The latter result should be interpreted with caution given the non-
normality of the emotional attachment to possessions variable. However, given that correlating a non-normal variable with a variable of normal distribution can attenuate $r$ (Goodwin & Leech, 2006), it is likely that the correlation between ER difficulties and emotional attachment beliefs would be higher (or unaltered) when both variables are normally distributed. These results demonstrate that Hypothesis 1 was fully supported.

As hoarding was moderately positively correlated with general symptoms of depression ($r = .35$) and other non-hoarding obsessive-compulsive (OCIR-NH) symptoms ($r = .33$) in the current study, a series of hierarchical multiple regression analyses was conducted to test whether the relationship between ER difficulties and hoarding symptoms remained significant after controlling for these variables.

Preliminary analyses were conducted to check assumptions for all regression analyses. As detailed in the above section on data screening and assumption testing, transformed variables were used in the regression analyses with the exception of raw variables that did not require transformation. Multicollinearity was assessed using Tolerance (Tol) statistics, where Tol values less than .10 are indicative of multicollinearity (Stevens, 2002). Normality, linearity, and homoscedasticity were assessed by inspection of the Normal P-P Plot of the Regression Standardised Residual and Scatterplot. Multivariate outliers were checked by inspecting Mahalanobis distances.

For the following hierarchical regression analysis there were no multivariate outliers, and no violations of the assumptions of normality, linearity, or homoscedasticity. Although DERS total (MA) was strongly correlated with both depression ($r = .67$) and OCIR-NH ($r = .50$) there were no issues of multicollinearity, as the Tol statistic ranged from .49 to .88.
Table 3
Study 1 Pearson’s Correlations for Hoarding Symptoms, Hoarding Beliefs, ER Difficulties, and Negative and Positive Urgency

<table>
<thead>
<tr>
<th></th>
<th>SI-R</th>
<th>SCI</th>
<th>DERS</th>
<th>UPPS-P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Clut</td>
<td>Disc</td>
<td>Acq</td>
</tr>
<tr>
<td>SI-R</td>
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<td></td>
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<tr>
<td>Clut</td>
<td>.80***</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Disc</td>
<td>.87***</td>
<td>.58***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acq</td>
<td>.73***</td>
<td>.35***</td>
<td>.51***</td>
<td></td>
</tr>
<tr>
<td>SCI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>.50***</td>
<td>.37***</td>
<td>.51***</td>
<td>.30***</td>
</tr>
<tr>
<td>EmAttach</td>
<td>.48***</td>
<td>.40***</td>
<td>.48***</td>
<td>.23***</td>
</tr>
<tr>
<td>DERS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (MA)</td>
<td>.42***</td>
<td>.21**</td>
<td>.44***</td>
<td>.39***</td>
</tr>
<tr>
<td>UPPS-P</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NU</td>
<td>.43***</td>
<td>.24**</td>
<td>.41***</td>
<td>.44***</td>
</tr>
<tr>
<td>PU</td>
<td>.31***</td>
<td>.19**</td>
<td>.31***</td>
<td>.30***</td>
</tr>
</tbody>
</table>

Note: N=199. *** p<.001, ** p<.01, * p<.05 (two-tailed)
SI-R=Savings Inventory Revised; Clut=Excessive Clutter; Disc=Difficulty Discarding; Acq=Excessive Acquisition; SCI=Saving Cognitions Inventory; EmAttach=Emotional Attachment to Possessions; DERS Total (MA)= Difficulties in Emotion Regulation Scale Total Minus Awareness subscale; UPPS-P=UPPS-P Impulsive Behavior Scale; NU=Negative Urgency; PU=Positive Urgency.
As seen in Table 4, DASS-21 depression was entered at Step 1 in the hierarchical multiple regression, explaining 12% of the variance in total hoarding symptoms. Non-hoarding obsessive-compulsive symptoms were entered at Step 2, explaining an additional 5% of the variance in hoarding symptoms. After entering DERS total (MA) at Step 3, the total variance explained by the model as a whole was 21%, $F(3, 195) = 16.99, p < .001$. Difficulties in ER explained an additional 4% of the variance in hoarding, over and above general depressive symptoms and non-hoarding obsessive-compulsive symptoms, $R^2_{change} = .04, F_{change} (1, 195) = 9.43, p < .01$. In the final model, DERS total (MA) and OCIR-NH were both significant predictors of overall hoarding symptoms, with DERS total (MA) making the strongest unique contribution. The lower half of Table 4 displays the unstandardized and standardized coefficients and semi-partial correlations for the predictor variables after Step 3 in the regression analysis.

Table 4

Summary of Hierarchical Multiple Regression Analysis for Difficulties in ER Predicting Hoarding Symptoms after Controlling for Covariates

<table>
<thead>
<tr>
<th>Step</th>
<th>Predictors</th>
<th>$R^2$</th>
<th>$R^2_{change}$</th>
<th>$F_{change}$</th>
<th>Sig. $F_{change}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DASS-21 Dep Total</td>
<td>.12</td>
<td>.12</td>
<td>26.60</td>
<td>.000</td>
</tr>
<tr>
<td>2</td>
<td>OCIR-NH</td>
<td>.17</td>
<td>.05</td>
<td>11.77</td>
<td>.001</td>
</tr>
<tr>
<td>3</td>
<td>DERS Total (MA)</td>
<td>.21</td>
<td>.04</td>
<td>9.43</td>
<td>.002</td>
</tr>
</tbody>
</table>

Coefficients after Step 3

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>B</th>
<th>SE B</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
<th>sr$^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>DASS-21 Dep</td>
<td>.08</td>
<td>.07</td>
<td>.10</td>
<td>1.19</td>
<td>.235</td>
<td>.006</td>
</tr>
<tr>
<td>OCIR-NH</td>
<td>.15</td>
<td>.07</td>
<td>.16</td>
<td>2.26</td>
<td>.025</td>
<td>.021</td>
</tr>
<tr>
<td>DERS Total (MA)</td>
<td>2.54</td>
<td>.83</td>
<td>.28</td>
<td>3.07</td>
<td>.002</td>
<td>.040</td>
</tr>
</tbody>
</table>

Note: N=199.
SI-R=Savings Inventory Revised; DASS-21=Depression Anxiety and Stress Scales 21; Dep=Depression; OCIR-NH=Obsessive Compulsive Inventory Revised Non-Hoarding Symptoms; DERS Total (MA)=Difficulties in Emotion Regulation Scale Total Minus Awareness subscale.
A series of hierarchical multiple regression analyses was then performed using each of the SI-R subscales as the dependent variable. As per the previous model, the following variables were added in stepwise order for each analysis: (1) DASS-21 depression; (2) OCIR-NH; and (3) DERS total (MA). There were no multivariate outliers, and no violations of the assumptions for multiple regression for any of these analyses.

As seen in Table 5, a similar pattern of results was found for the difficulty discarding and acquisition subscales, with ER difficulties predicting significant variance in these subscales after controlling for covariates. In the final models, DERS total (MA) was a unique significant predictor of difficulty discarding, and both OCIR-NH and DERS total (MA) were significant predictors of acquisition. However, neither OCIR-NH nor DERS total (MA) were significantly associated with the clutter subscale over-and-above general depressive symptoms.

Overall, these findings suggest that Hypothesis 3 was largely supported with regard to the relationship between ER difficulties and hoarding. That is, ER difficulties were significantly associated with total hoarding symptoms and the difficulty discarding and acquisition facets of hoarding after controlling for general depressive and non-hoarding obsessive-compulsive symptoms. In contrast, ER difficulties appear to offer little predictive power to excessive clutter beyond that contributed by general depressive symptoms.
Table 5
Summary of Hierarchical Multiple Regression Analyses for Difficulties in ER
Predicting Difficulty Discarding, Excessive Acquisition, and Excessive Clutter after
Controlling for Covariates

<table>
<thead>
<tr>
<th>Step</th>
<th>Predictor Variables</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>sr²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SI-R Discarding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>DASS-21 Dep</td>
<td>.05</td>
<td>.05</td>
<td>.08</td>
<td>.89</td>
<td>.373</td>
<td>.003</td>
</tr>
<tr>
<td>2</td>
<td>OCIR-NH</td>
<td>.05</td>
<td>.05</td>
<td>.07</td>
<td>1.02</td>
<td>.308</td>
<td>.004</td>
</tr>
<tr>
<td>3</td>
<td>DERS Total (MA)</td>
<td>2.51</td>
<td>.65</td>
<td>.35</td>
<td>3.87</td>
<td>.000</td>
<td>.062</td>
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</tbody>
</table>

R² = .20  ΔR² = .06  ΔF = 14.99***

<table>
<thead>
<tr>
<th></th>
<th>SI-R Acquisition</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DASS-21 Dep</td>
<td>.05</td>
<td>.04</td>
<td>.09</td>
<td>1.08</td>
<td>.280</td>
<td>.005</td>
</tr>
<tr>
<td>2</td>
<td>OCIR-NH</td>
<td>.13</td>
<td>.04</td>
<td>.21</td>
<td>2.91</td>
<td>.004</td>
<td>.035</td>
</tr>
<tr>
<td>3</td>
<td>DERS Total (MA)</td>
<td>1.37</td>
<td>.54</td>
<td>.23</td>
<td>2.54</td>
<td>.012</td>
<td>.027</td>
</tr>
</tbody>
</table>

R² = .20  ΔR² = .03  ΔF = 6.46*

<table>
<thead>
<tr>
<th></th>
<th>SI-R Clutter</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DASS-21 Dep</td>
<td>.09</td>
<td>.06</td>
<td>.14</td>
<td>1.45</td>
<td>.150</td>
<td>.010</td>
</tr>
<tr>
<td>2</td>
<td>OCIR-NH</td>
<td>.08</td>
<td>.06</td>
<td>.11</td>
<td>1.34</td>
<td>.181</td>
<td>.009</td>
</tr>
<tr>
<td>3</td>
<td>DERS Total (MA)</td>
<td>.53</td>
<td>.76</td>
<td>.07</td>
<td>.69</td>
<td>.488</td>
<td>.002</td>
</tr>
</tbody>
</table>

R² = .06  ΔR² = .01  ΔF = 0.48 ns

Note: N=199. *** p<.001, ** p<.01, * p<.05 (two-tailed), ns=non-significant
SI-R=Savings Inventory Revised; Discarding=Difficulty Discarding; Acquisition=Excessive Acquisition; Clutter=Excessive Clutter; DASS-21=Depression Anxiety and Stress Scales 21; Dep=Depression; OCIR-NH=Obsessive Compulsive Inventory Revised Non-Hoarding Symptoms; DERS Total (MA)=Difficulties in Emotion Regulation Scale Total Minus Awareness subscale.
Facets of Urgency and Hoarding

Pearson’s correlations were performed to explore the association between facets of urgency and hoarding-related phenomena, and are displayed in Table 3. Total hoarding symptoms were moderately positively correlated with both negative and positive urgency, with negative urgency demonstrating a stronger association with hoarding. Negative urgency was also positively associated with all three subscales of the SI-R, demonstrating moderate correlations with the acquisition and difficulty discarding subscales, and a weak correlation with the clutter subscale. Similarly, positive urgency demonstrated moderate correlations with difficulty discarding and acquisition symptoms, and a weak correlation with clutter symptoms. Hoarding beliefs, as measured by the SCI total and emotional attachment subscale, were also positively associated with both negative and positive urgency, and these correlations were of small magnitude. Again, the association between the urgency facets and emotional attachment beliefs should be interpreted with caution given the non-normality of the latter variable. These results demonstrate that Hypothesis 2 was fully supported.

A series of hierarchical multiple regression analyses was conducted to test whether negative and positive urgency are predictive of hoarding symptoms after controlling for depressive and non-hoarding obsessive-compulsive symptoms. Given that negative and positive urgency share high conceptual overlap and were strongly correlated with one another in the current study ($r = .61$), two separate hierarchical multiple regression analyses were initially conducted with each urgency variable to independently assess the role of negative and positive urgency in predicting hoarding symptoms after controlling for covariates. There were no violations of the assumptions of normality, linearity, or homoscedasticity for these analyses. However, one multivariate outlier was identified and excluded from the hierarchical regression analysis for negative urgency.

The results for the negative urgency model are presented in Table 6. As shown, DASS-21 depression was entered at Step 1 in the hierarchical multiple regression, explaining 13% of the variance in total hoarding symptoms. Non-hoarding obsessive-compulsive symptoms were entered at Step 2, explaining an additional 4% of the variance in hoarding symptoms. After entering negative urgency at Step 3, the total variance explained by the model as a whole was 24%, $F(3, 194) = 20.50, p < .001$. Negative urgency explained an additional 7% of the variance in hoarding, over-and-
above general depressive symptoms and non-hoarding obsessive-compulsive symptoms, \( R^2_{\text{change}} = .07, F_{\text{change}} (1, 194) = 17.31, p < .001 \). In the final model, negative urgency and OCIR-NH were both significant predictors of overall hoarding symptoms. The lower half of Table 6 displays the unstandardized and standardized coefficients and semi-partial correlations for the predictor variables after Step 3 in the regression analysis.

Table 6
Summary of Hierarchical Multiple Regression Analysis for Negative Urgency Predicting Hoarding Symptoms after Controlling for Covariates

<table>
<thead>
<tr>
<th>Step</th>
<th>Predictors</th>
<th>( R^2 )</th>
<th>( R^2_{\text{change}} )</th>
<th>( F_{\text{change}} )</th>
<th>Sig. ( F_{\text{change}} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DASS-21 Dep</td>
<td>.13</td>
<td>.13</td>
<td>29.05</td>
<td>.000</td>
</tr>
<tr>
<td>2</td>
<td>OCIR-NH</td>
<td>.17</td>
<td>.04</td>
<td>10.33</td>
<td>.002</td>
</tr>
<tr>
<td>3</td>
<td>Negative Urgency</td>
<td>.24</td>
<td>.07</td>
<td>17.31</td>
<td>.000</td>
</tr>
</tbody>
</table>

Coefficients after Step 3

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>( B )</th>
<th>( SE \ B )</th>
<th>( \beta )</th>
<th>( t )</th>
<th>( p )</th>
<th>( sr^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>DASS-21 Dep</td>
<td>.07</td>
<td>.06</td>
<td>.09</td>
<td>1.15</td>
<td>.252</td>
<td>.005</td>
</tr>
<tr>
<td>OCIR-NH</td>
<td>.20</td>
<td>.06</td>
<td>.21</td>
<td>3.19</td>
<td>.002</td>
<td>.040</td>
</tr>
<tr>
<td>Negative Urgency</td>
<td>.79</td>
<td>.19</td>
<td>.32</td>
<td>4.16</td>
<td>.000</td>
<td>.068</td>
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</tbody>
</table>

Note: \( N=198 \).

The results for the positive urgency model are displayed in Table 7. As shown, DASS-21 depression was entered at Step 1 in the hierarchical multiple regression, explaining 12% of the variance in total hoarding symptoms. Non-hoarding obsessive-compulsive symptoms were entered at Step 2, explaining an additional 5% of the variance in hoarding symptoms. After entering positive urgency at Step 3, the total variance explained by the model as a whole was 21%, \( F(3, 195) = 17.29, p < .001 \). Positive urgency explained an additional 4% of the variance in hoarding, over-and-above general depressive symptoms and non-hoarding obsessive-compulsive symptoms, \( R^2_{\text{change}} = .04, F_{\text{change}} (1, 195) = 10.17, p < .01 \). In the final model, positive urgency,
depressive symptoms, and OCIR-NH were all significant predictors of total hoarding symptoms. The lower half of Table 7 displays the unstandardized and standardized coefficients and semi-partial correlations for the predictor variables after Step 3 in the regression analysis.

Table 7
Summary of Hierarchical Multiple Regression Analysis for Positive Urgency Predicting Hoarding Symptoms after Controlling for Covariates

<table>
<thead>
<tr>
<th>Step</th>
<th>Predictors</th>
<th>$R^2$</th>
<th>$R^2_{change}$</th>
<th>$F_{change}$</th>
<th>Sig. $F_{change}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DASS-21 Dep</td>
<td>.12</td>
<td>.12</td>
<td>26.60</td>
<td>.000</td>
</tr>
<tr>
<td>2</td>
<td>OCIR-NH</td>
<td>.17</td>
<td>.05</td>
<td>11.77</td>
<td>.001</td>
</tr>
<tr>
<td>3</td>
<td>Positive Urgency</td>
<td>.21</td>
<td>.04</td>
<td>10.17</td>
<td>.002</td>
</tr>
</tbody>
</table>

Coefficients after Step 3

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>B</th>
<th>SE B</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
<th>sr$^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>DASS-21 Dep</td>
<td>.16</td>
<td>.05</td>
<td>.20</td>
<td>2.88</td>
<td>.004</td>
<td>.033</td>
</tr>
<tr>
<td>OCIR-NH</td>
<td>.21</td>
<td>.06</td>
<td>.22</td>
<td>3.30</td>
<td>.001</td>
<td>.044</td>
</tr>
<tr>
<td>Positive Urgency</td>
<td>2.22</td>
<td>.70</td>
<td>.21</td>
<td>3.19</td>
<td>.002</td>
<td>.041</td>
</tr>
</tbody>
</table>

Note: N=199.
SI-R=Savings Inventory Revised; DASS-21=Depression Anxiety and Stress Scales 21; Dep=Depression; OCIR-NH=Obsessive Compulsive Inventory Revised Non-Hoarding Symptoms; Positive Urgency=Positive Urgency subscale of the UPPS-P Impulsive Behavior Scale.

A series of hierarchical multiple regression analyses was also performed for each urgency variable predicting the three subscales of the SI-R. The results demonstrated that negative urgency remained significantly associated with symptoms of difficulty discarding and acquisition after controlling for depressive and non-hoarding obsessive-compulsive symptoms, explaining an additional 6% of the variance in discarding, $R^2_{change} = .06, F_{change} (1, 194) = 14.17, p < .001$, and an additional 9% of the variance in acquisition, $R^2_{change} = .09, F_{change} (1, 194) = 22.76, p < .001$. In the final models, negative urgency and non-hoarding obsessive-compulsive symptoms were significant predictors of both difficulty discarding and acquisition. In contrast, negative urgency (and OCIR-NH) was not significantly associated with symptoms of clutter after controlling for depressive symptoms, although negative urgency did approach statistical
significance (i.e., $p = .054$). A similar pattern of results was found for positive urgency. That is, after controlling for covariates, positive urgency accounted for an additional 4% of the variance in difficulty discarding, $R^2_{\text{change}} = .04$, $F_{\text{change}} (1, 195) = 10.37, p < .01$, and acquisition $R^2_{\text{change}} = .04$, $F_{\text{change}} (1, 195) = 8.98, p < .01$. In the final models, depression, OCIR-NH, and positive urgency were significant predictors of both difficulty discarding and acquisition. However, neither positive urgency nor OCIR-NH were significantly associated with symptoms of clutter after controlling for depressive symptoms, and there were no unique significant predictors in the final model. A summary of these analyses is presented in Table C1 of Appendix C.

To examine whether both urgency constructs contribute unique variance in the prediction of hoarding symptoms, a series of hierarchical multiple regressions were also performed where both negative and positive urgency were entered as simultaneous predictors at Step 3. As for the previous regressions with these variables, testing of the assumptions revealed one multivariate outlier which was excluded from these analyses, but otherwise all assumptions were met. The results are displayed in Table 8, and demonstrate that Step 3 was significant for SI-R total, difficulty discarding, and acquisition. Specifically, after controlling for depressive and non-hoarding obsessive-compulsive symptoms, negative and positive urgency explained an additional 7% of the variance in overall hoarding symptoms and symptoms of difficulty discarding, and an additional 9% of the variance in acquisition. In each of these models, negative urgency and OCIR-NH were unique significant predictors. With regard to the prediction of clutter, neither OCIR-NH nor the urgency variables were significantly associated with symptoms of clutter after controlling for depressive symptoms, and there were no unique significant predictors in the final model.

In sum, the findings from the urgency regression analyses demonstrate that, when considered independently, negative and positive urgency are significantly associated with total hoarding symptoms, excessive acquisition, and difficulty discarding, over-and-above depressive and non-hoarding obsessive-compulsive symptoms. However, when considering the two facets of urgency as simultaneous predictors of hoarding symptoms, only negative urgency is a unique significant predictor of these hoarding variables. Therefore, with regard to the relationship between facets of urgency and hoarding, these findings provide partial support for Hypothesis 3.
Table 8

Summary of Hierarchical Multiple Regression Analyses for Negative and Positive Urgency Simultaneously Predicting Hoarding after Controlling for Covariates

Note: N=198

*** p<.001, ** p<.01, * p<.05 (two-tailed), ns=non-significant

SI-R=Savings Inventory Revised; Discarding=Difficulty Discarding; Acquisition=Excessive Acquisition; Clutter=Excessive Clutter; DASS-21=Depression Anxiety and Stress Scales 21; Dep=Depression; OCIR-NH=Obsessive Compulsive Inventory Revised Non-Hoarding Symptoms; Negative Urgency=Negative Urgency subscale of the UPPS-P Impulsive Behavior Scale; Positive Urgency=Positive Urgency subscale of the UPPS-P Impulsive Behavior Scale.

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Dependent variable SI-R Discarding

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Dependent variable SI-R Acquisition

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Note: N=198

*** p<.001, ** p<.01, * p<.05 (two-tailed), ns=non-significant

SI-R=Savings Inventory Revised; Discarding=Difficulty Discarding; Acquisition=Excessive Acquisition; Clutter=Excessive Clutter; DASS-21=Depression Anxiety and Stress Scales 21; Dep=Depression; OCIR-NH=Obsessive Compulsive Inventory Revised Non-Hoarding Symptoms; Negative Urgency= Negative Urgency subscale of the UPPS-P Impulsive Behavior Scale; Positive Urgency=Positive Urgency subscale of the UPPS-P Impulsive Behavior Scale.
Emotional Attachment Beliefs in the ER-Hoarding Relationship

To test whether emotional attachment beliefs mediated the relationship between ER difficulties and hoarding symptoms, a mediation model using transformed variables was conducted through SPSS 21 via the Preacher and Hayes ‘Indirect’ macro (Preacher & Hayes, 2008). Following recommendations regarding the interpretation of indirect effects (e.g., MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; MacKinnon et al., 2004), a sampling with replacement, bias-corrected, bootstrapping procedure (5000 samples of $N = 199$) using the maximum likelihood method of estimation was used for examination of the statistical significance of the indirect (mediated) path. An important advantage of the bootstrapping procedure is that no assumptions are made about the shape of the sampling distribution of the indirect effect or its constituent paths.

The bootstrapping procedure generates an empirical approximation of the sampling distribution of a statistic through taking 5000 samples with replacement from the data set (i.e., individuals can be repeatedly sampled), of which all are the original sample size ($N = 199$), and calculating the weights for the indirect paths for each sample, resulting in a sampling distribution for the indirect path. This approximation of the sampling distribution is then used to calculate $p$-values and construct confidence intervals (CIs), for example through taking the scores of the mediated effect at the 2.5th and 97.5th percentiles for a 95% CI. The bootstrapping procedure was performed through options available through the ‘Indirect’ macro for SPSS (Preacher & Hayes, 2008). In contrast, assuming a normal distribution for the sampling distribution of mediated effects is questionable, as the sampling distribution of such mediated paths are often not only non-normal but also non-symmetrical. Such non-normality leads to under-powering of common tests of mediation such as the Sobel test for mediation (see Preacher & Hayes, 2004, for further discussion of the advantages of bootstrapping).

The mediation model with unstandardized B weights is illustrated in Figure 1. First, it was found that ER difficulties were positively associated with hoarding symptoms ($B = 2.54, t(195) = 3.07, p < .01$). It was also found that ER difficulties were positively associated with emotional attachment beliefs ($B = 0.35, t(195) = 2.71, p < .01$). Finally, the mediator, emotional attachment beliefs, was positively associated with hoarding symptoms ($B = 2.50, t(195) = 5.97, p < .001$). The bootstrapped estimates were used to examine the indirect effect of ER difficulties (DERS total MA) on hoarding symptoms (SI-R total) via emotional attachment beliefs (SCI EmAttach). The
bootstrapped estimates indicated that the indirect effect was statistically significant (B = 0.88; 95% CI = 0.21 to 1.73). As the direct effect of ER difficulties on hoarding symptoms remained significant when controlling for emotional attachment beliefs (B = 1.66, t(194) = 2.14, p < .05), this suggests partial mediation.

Figure 1. Indirect effect of ER difficulties on hoarding symptoms through emotional attachment beliefs.

Note: N=199. ***p<.001, **p<.01, *p<.05
Dashed line represents c’ pathway
Overall R² = 0.33. Depression and non-hoarding obsessive-compulsive symptoms included as covariates, but not depicted here.

These results demonstrate that the relationship between ER difficulties and hoarding symptoms was partially mediated by beliefs about emotional attachment to possessions, thereby supporting hypothesis 4. A similar pattern of results was found after re-running this mediation model with saving cognitions (SCI total) as the mediator (see Figure D1 in Appendix D).

Discussion

The current study aimed to investigate multiple aspects of emotion dysregulation, with the facet of impulse control difficulties being separately investigated under conditions of positive and negative affect, in relation to hoarding behaviour and cognitions in a non-clinical sample. Additionally, in the context of the established CBT model of HD, the role of beliefs was examined in the ER-hoarding relationship. Given a sound theoretical rationale and previous empirical findings, it was anticipated that ER difficulties and two emotion-based facets of impulsivity (i.e., negative and positive urgency) would be associated with hoarding behaviour after controlling for relevant covariates, and that the ER-hoarding relationship would be mediated by beliefs about
emotional attachment to possessions. The findings of the current study generally supported these contentions, and are discussed in detail below.

**Findings on Emotion Regulation Difficulties and Hoarding**

As the results of the factor analysis for the DERS (Gratz & Roemer, 2004) did not replicate the proposed six-factor structure in the current study, a modified variable was utilised for exploring the relationship between ER difficulties and hoarding symptoms. This overarching measure of emotion dysregulation encompassed difficulties engaging in goal-directed behaviour, non-acceptance of emotional responses, limited access to ER strategies deemed effective, impulse control difficulties, and lack of emotional clarity (Gratz & Roemer, 2004), and was found to be positively correlated with hoarding symptoms, demonstrating that greater overall ER difficulties were associated with greater hoarding symptoms. Similarly, greater ER difficulties were associated with higher excessive acquisition, greater difficulty discarding, and to a lesser degree, higher levels of clutter. Emotion regulation difficulties were also positively associated with higher scores on a measure of hoarding-related beliefs.

These findings are consistent with recent research by Raines et al. (2015) which found that the DERS was positively associated with hoarding severity, as measured by the SI-R total and acquisition subscale scores in a sample of individuals with clinical hoarding symptoms. While these authors did not find any associations between the DERS and symptoms of difficulty discarding and clutter in their sample, the current study suggests that ER difficulties may play a role in these symptoms. The findings from the current study are in contrast to those of Fernández de la Cruz et al. (2013), which found no significant relationships between three different measures of hoarding severity and the DERS total in a clinical sample comprised of individuals with hoarding and OCD. Rather, the DERS was only moderately correlated with non-hoarding obsessive-compulsive symptoms. Although individuals with HD (and particularly those with comorbid OCD) exhibited greater ER difficulties compared to healthy controls, the findings tentatively suggested that ER difficulties might play a more prominent role in OCD than in hoarding (Fernández de la Cruz et al., 2013). Similarly, in the current study, the DERS was found to be more strongly correlated with non-hoarding obsessive-compulsive symptoms than hoarding symptoms. However, given that ER difficulties were also moderately correlated with hoarding symptoms, the results provide support for the role of this transdiagnostic construct in both symptom types.
The discrepancies between the findings of the current study and previous research may be in part due to the use of a modified DERS variable in the current study (i.e., the exclusion of the lack of emotional awareness subscale) and/or differences in the sample characteristics. For example, the current sample had a lower mean score on the DERS than did the samples reported by Fernández de la Cruz et al. (2013) and Raines et al. (2015). This is perhaps unsurprising given that the modified DERS variable had fewer items; however, even when considering the full DERS scale, the current sample had a lower mean compared to the other two studies. As such, these mean differences may be due to the non-clinical nature of the current sample and other differences in the sample characteristics. Indeed, the current sample was a large non-clinical sample ($N = 199$) with a higher percentage of females than the study by Raines et al. which utilised a smaller sample of individuals with clinical hoarding symptoms ($N = 97$). This may in part account for the differential findings regarding the difficulty discarding and clutter associations. Fernández de la Cruz et al. performed correlations on a smaller clinical sample ($N = 60$) which had a higher ratio of female to male participants than the current study, and their comparison groups had modest sample sizes and may have been underpowered. Due to the nature of being a non-clinical sample, the current study demonstrated lower mean hoarding scores and a lower mean age compared to the other two studies. These differences may in part account for some of the discrepancies found in the literature with regard to the relationship between ER difficulties and hoarding.

The relationship between emotion dysregulation and hoarding was robust in the current study, as most of the associations remained significant after controlling for the effects of known hoarding covariates (i.e., depression and non-hoarding obsessive-compulsive symptoms). Although the percentage of variance contributed by the DERS was generally small, ER difficulties made a significant unique contribution to overall hoarding symptoms, difficulty discarding, and excessive acquisition, above-and-beyond symptoms of depression and non-hoarding obsessive-compulsive symptoms. These results are consistent with the theoretical rationale conceptualising the phenomenology and CBT model of HD in an emotion regulatory framework. That is, saving behaviour (as opposed to discarding) enables individuals with HD to avoid the strong emotional reactions and distress associated with the thought or action of discarding (Frost & Hartl, 1996; Steketee & Frost, 2003, 2014b), and therefore, appears to serve an emotion
regulatory function. As such, one would anticipate that difficulty discarding is indicative of difficulties with ER, and the results of the current study support this notion. Likewise, the finding that emotion dysregulation is associated with excessive acquisition is consistent with the conceptualisation of acquiring as a maladaptive attempt to regulate one’s positive and negative emotions (Tolin, 2011), along with research suggesting that compulsive buying is associated with motivations to change one’s mood state or arousal level (Faber & Christenson, 1996). As such, acquiring and saving behaviours may represent ER efforts in themselves, which in the absence of more adaptive ER abilities can be problematic. Indeed, individuals with greater ER difficulties (or who believe that they cannot tolerate negative emotions or that they lack effective strategies for managing their emotions) are likely to utilise maladaptive or avoidance-based strategies in order to alleviate negative emotions. The strong (positive and negative) emotional reactions and avoidance of distress experienced by individuals with HD appear to be indicative of difficulties with regulating emotions, and the results of the current study support this contention, particularly with regard to acquiring and saving behaviour.

In contrast to expectations, neither ER difficulties nor non-hoarding obsessive-compulsive symptoms were significantly associated with excessive clutter after accounting for symptoms of depression. There may be several reasons for this finding. Firstly, this may be due to the nature of the non-clinical sample. Consistent with other non-clinical samples, the scores on the excessive clutter subscale in this study were relatively low and the range was limited, which may have affected the power to detect significant associations after controlling for covariates. In addition, the correlation between ER difficulties and clutter was of weak magnitude. Alternatively, as clutter is the direct consequence of excessive acquisition and saving behaviour, clutter may be more distally related to ER difficulties than the other two hoarding behaviours. Indeed, research has shown clutter to be uniquely predicted by behavioural avoidance and not emotional avoidance (Ayers et al., 2014). Likewise, Timpano and colleagues (2014) found that clutter was not associated with self-report and behavioural measures of emotional intolerance after controlling for depressive and anxiety symptoms in a non-clinical sample, while acquiring and difficulty discarding were. In addition, research suggests that heightened general and hoarding-related emotional reactivity are associated with difficulty discarding and acquisition, but not clutter symptoms, after
controlling for gender, age, and symptoms of anxiety and depression (A. M. Shaw, Timpano, et al., 2015). Collectively, this research may support the notion that clutter is more closely associated with information processing deficits than the emotionally-driven processes that appear to underlie acquisition and saving behaviour (Steketee & Frost, 2003).

While the results of the factor analysis in the current study precluded a fine-grained analysis of specific aspects of emotion dysregulation to specific hoarding symptoms (e.g., whether non-acceptance of emotions, difficulties engaging in goal-directed behaviour, and a lack of access to effective ER strategies are differentially associated with acquiring, clutter, and discarding behaviour), the findings from the current study suggest that general emotion dysregulation is implicated in hoarding, particularly with regard to the symptoms of acquiring and discarding. As such, this study contributes to the emerging body of research on ER difficulties and hoarding symptoms. Furthermore, an important contribution of this study was the exploration of ER difficulties in the context of the existing CBT model of HD. As anticipated, the current study established that the relationship between ER difficulties and hoarding was partially mediated by emotional attachment beliefs. This implies that while ER difficulties may lead directly to hoarding symptoms (i.e., in the absence of adaptive ER abilities and strategies hoarding behaviours may be used as an emotional regulator), ER difficulties may also lead indirectly to hoarding symptoms through distorted beliefs about the need to save possessions due to emotional attachment.

The development of such beliefs may arise from vulnerability factors which in turn, may impact on ER processes. For example, negative early experiences are a known risk factor for HD and have been suggested to influence an individual’s perception of, and attachment to, possessions, in that possessions provide them a sense of safety and security (see Kyrios, 2014). Presumably, negative early experiences also impact on an individual’s emotional processing and regulation abilities. Indeed, research suggests that exposure to abuse, neglect, violence, and maltreatment in childhood appears to hinder the ability to process and manage emotions effectively (e.g., Maughan & Cicchetti, 2002; Shields & Cicchetti, 1998; see Thompson, 2014 for further detail on how early family experiences impact on the development of ER). As such, ER difficulties may be implicated in the formation of strong attachments to, and beliefs about, possessions. Perhaps in the presence of emotion dysregulation, individuals use whatever means are
available to them as a way of regulating their emotions (e.g., relying on possessions for achieving positive emotions and ‘soothing’ negative ones), which over time influence the development of strong emotional attachments to, and mistaken beliefs about, the need for possessions (Phung et al., 2015). It could even be the case that possessions take on the role of a supportive close friend or loved one, as the emotional attachment subscale of the SCI contains several items where possessions are ascribed with human-like qualities (Steketee et al., 2003) and research indicates that anthropomorphic tendencies are associated with hoarding (Kellett et al., 2010; Neave, Jackson, Saxton, & Hönekopp, 2015; Timpano & Shaw, 2013). In turn, these mistaken beliefs about, and strong attachments to, possessions may eventually lead to pathological hoarding behaviours (i.e., excessive acquiring, clutter, and difficulty discarding). The results of the current study are in line with, and contribute to, recent research demonstrating that emotional attachment beliefs mediate the relationship between other ER constructs (i.e., negative urgency, AS) and hoarding symptoms (Phung et al., 2015).

While beliefs about emotional attachment to possessions appear to be particularly relevant in the ER-hoarding relationship (as they are inherently associated with emotions and may in some part develop from the use of possessions as a substitute for adaptive ER strategies), even using the SCI total score as the mediator demonstrated that overall saving cognitions partially mediated the relationship between ER difficulties and hoarding. This suggests that beliefs about the need to save possessions for reasons such as memory, responsibility, and control, are implicated in the ER-hoarding relationship, signifying that such beliefs may also involve emotional elements.

**Findings on Facets of Urgency and Hoarding**

Despite being unable to explore each of the six facets of the DERS (Gratz & Roemer, 2004) in relation to hoarding behaviour, the inclusion of a separate measure of impulsivity in the current study allowed for a more detailed exploration of two facets of impulse control difficulties most relevant to ER – positive and negative urgency. As hypothesized, negative urgency was positively correlated with hoarding symptoms and hoarding beliefs. Higher levels of negative urgency were associated with greater difficulty discarding, higher excessive acquisition, and to a lesser extent, higher levels of clutter. These findings support previous research demonstrating a positive relationship between the (negative) urgency subscale of the original UPPS (Whiteside & Lynam, 2001) and total hoarding symptoms, excessive acquisition, difficulty discarding,
and clutter (Phung et al., 2015; Timpano, Rasmussen, et al., 2013). With the exception of the clutter subscale, the associations in the current study remained significant after controlling for depressive and non-hoarding obsessive-compulsive symptoms, with negative urgency and non-hoarding obsessive-compulsive symptoms being unique predictors of SI-R total, difficulty discarding, and excessive acquisition. These findings are consistent with those of Timpano, Rasmussen, et al. (2013), who found negative urgency and non-hoarding obsessive-compulsive symptoms to be significantly predictive of difficulty discarding and excessive acquisition. In contrast, Timpano, Rasmussen, et al. found that negative urgency and non-hoarding obsessive-compulsive symptoms were significant predictors of clutter after controlling for symptoms of anxiety and depression. This discrepancy is surprising, given that the current study utilised a non-clinical sample of a similar size, with a similar mean age and representation of female participants to the study by Timpano, Rasmussen, et al. However, the current study controlled for different covariates and Timpano and colleagues utilised a German hoarding measure.

The findings of the current study suggest that an individual’s tendency to give in to strong impulses when experiencing negative emotions is implicated in hoarding, particularly with regard to acquiring and saving behaviours. That is, when individuals with hoarding experience distress, negative urgency may lead to the need to act, perhaps by provoking increased acquisition (Phung et al., 2015). Indeed, according to Cyders and Smith’s (2008b) theory, individuals characterized by negative urgency are more prone to regulate their negative emotional states through engaging in maladaptive behaviours, which is consistent with research demonstrating the role of negative urgency in compulsive buying (Alemis & Yap, 2013; Rose & Segrist, 2014; A. D. Williams & Grisham, 2012). Similarly, when an individual is unable to cope with the negative emotions elicited by the prospect of discarding, negative urgency may lead to the impulsive abandonment of sorting and discarding tasks (Phung et al., 2015). As such, negative urgency may influence acquisition and saving behaviour, thereby contributing to hoarding severity.

To the author’s knowledge, the current study is the first known investigation of positive urgency in relation to hoarding symptoms, and provides support for the role of this construct in relation to hoarding. The current study found that positive urgency was positively associated with overall hoarding symptoms and hoarding beliefs. Higher
levels of positive urgency were also associated with greater difficulty discarding, higher excessive acquisition, and to a lesser extent, higher levels of clutter. Again, with the exception of the clutter subscale, these associations remained significant after controlling for depression and non-hoarding obsessive-compulsive symptoms, with positive urgency, depression, and non-hoarding obsessive-compulsive symptoms being unique predictors of SI-R total, difficulty discarding, and excessive acquisition. Although these are the first reported results on positive urgency and hoarding, the findings are consistent with previous research demonstrating associations between positive urgency and other compulsive behaviours such as compulsive buying (Rose & Segrist, 2014; A. D. Williams & Grisham, 2012) and gambling (Cyders & Smith, 2008a; Cyders et al., 2007).

These findings suggest that the propensity to urgently act in response to positive emotions is implicated in both acquiring behaviour and difficulty discarding. This is consistent with research indicating that excessive acquisition is motivated by both positive and negative emotional states (e.g., Grisham et al., 2011; Mueller et al., 2009; Steketee & Tolin, 2011; A. D. Williams & Grisham, 2012), and the CBT model of HD which implicates strong positive emotions in the reinforcement of acquiring and saving behaviours (Frost & Hartl, 1996; Frost & Steketee, 1998, 2008; Steketee & Frost, 2003, 2014b). Indeed, when experiencing positive feelings, positive urgency is likely to provoke individuals with HD to engage in increased acquiring behaviour as a way of maintaining or prolonging positive mood. This may be particularly the case as many individuals with HD experience comorbid depression (Frost, Steketee, et al., 2011; Tolin, Stevens, et al., 2012), which could suggest that during times of positive mood they may be more likely to engage in actions that prolong those positive emotions. In addition, as positive feelings such as pleasure, joy, excitement, and pride may be triggered when handling possessions or churning through clutter when attempting to sort, organise, and discard, positive urgency may prompt individuals with HD to prolong the handling experience and/or lead to the impulsive abandonment of their attempts to sort and discard in order to prolong their positive mood state. As such, positive urgency may lead to increased saving behaviour (i.e., difficulty discarding). Although positive urgency was associated with clutter, this correlation was of weak magnitude and failed to remain significant after controlling for symptoms of depression.
According to Cyders and Smith (2008b), the experience of intense emotion (negative or positive) impacts on rational decision-making and impedes an individual’s focus on long-term goals, which can lead to taking impulsive action. As high emotionality appears to be associated with a greater proclivity for taking impulsive action, the regular experience of heightened emotionality may increase an individual’s risk for engaging more frequently in such acts. Rash actions tend to be reinforced irrespective of whether they are motivated by negative or positive emotions, and even when they are contradictory to an individual’s long-term interests (Cyders & Smith, 2008b). As such, the theory of urgency appears to be consistent with the CBT model of hoarding which highlights the role of strong emotional reactions as reinforcing of acquiring and saving behaviour (Frost & Hartl, 1996; Frost & Steketee, 1998, 2008; Steketee & Frost, 2003, 2014b).

By examining the two facets of urgency independently, the results of the current study provided evidence for the role of impulse control difficulties under conditions of negative and positive affect in hoarding. This is consistent with research demonstrating that both negative and positive urgency are independently associated with compulsive buying, accounting for similar amounts of variance (Rose & Segrist, 2014). However, when considering the two facets of urgency simultaneously in the current study, only negative urgency remained a significant unique predictor of hoarding symptoms. This is likely due to the conceptual overlap and high correlation between the two urgency facets. However, future research on larger samples is recommended for investigating these two urgency facets concurrently, as this may increase the power to detect the unique contributions of each, and would help determine whether negative urgency is indeed more influential in the prediction of hoarding symptoms.

Collectively, the current study contributes to the existing literature on ER and impulsivity in HD, providing evidence for the role of general emotion dysregulation and emotion-based facets of impulsivity in hoarding. However, it is important to acknowledge the limitations of this preliminary study.

Limitations

As data from the current sample did not support the theoretical factor structure of the DERS (Gratz & Roemer, 2004), one of the main aims of the current study could not be addressed. That is, the results from the factor analysis prevented a more fine-grained analysis of specific ER deficits in relation to specific hoarding behaviours.
However, the results from the current study are consistent with recent research highlighting the psychometric limitations of the DERS, including a method effect due to the reverse-scored items on the scale (Bardeen et al., 2016; Bardeen et al., 2012; Cho & Hong, 2013; Lee et al., 2016). In consideration of previous research suggesting that the lack of awareness subscale may not represent the same higher-order construct and may not be appropriate to be included in a DERS total score (Bardeen et al., 2012; Lee et al., 2016), this subscale was removed from the total score in the current study. Future research utilising a recently modified version of the DERS (Bardeen et al., 2016) in relation to hoarding behaviour is recommended.

A second limitation of the current study was the use of a non-clinical sample, which may limit the generalizability of the findings to clinical hoarding populations. However, the general phenomenological characteristics in non-clinical samples parallel those seen in clinical hoarding samples and research on the nosology of hoarding suggests that it is best conceptualised as a dimensional construct (Timpano, Broman-Fulks, et al., 2013) that occurs along a continuum in both non-clinical and clinical cohorts (Coles et al., 2003; Damecour & Charron, 1998; Steketee & Frost, 2003). Even so, it is possible that the relationship between emotion dysregulation and hoarding is different across non-clinical and clinical populations. Indeed, the findings from the current study differ from those found by Fernández de la Cruz et al. (2013) which found no significant association between the DERS and hoarding symptoms in their clinical sample. Another limitation of the current study is the exclusive use of self-report measures which may reflect an individual’s perceptions of their ER abilities, rather than their actual ability to regulate emotions, which may or may not be equivalent. Future research utilising interview designs or behavioural measures to assess ER abilities is recommended. The cross-sectional and correlational nature of this study is another limitation, as it precludes a determination of whether ER deficits precede hoarding beliefs and symptoms, or are a result of hoarding difficulties. As a reverse mediation model where hoarding beliefs preceded ER difficulties in the prediction of hoarding symptoms was also significant, interpretations about temporal processes in the current study are only theoretical. Therefore, it is recommended that future research investigate ER deficits in hoarding using longitudinal designs. In addition, third variable issues are an inherent problem in correlational designs. While the current study controlled for the effects of known hoarding covariates (i.e., depression and non-hoarding obsessive-
compulsive symptoms), there were other variables that were not controlled for. For example, although previous research suggests that the relationship between impulsivity and hoarding might be accounted for by age (Rasmussen et al., 2013), age could not be controlled for in the current study due to a non-normal distribution. Furthermore, other constructs such as neuroticism and emotional reactivity are likely confounded with ER difficulties, and were not measured in the current study. Future research is required to determine whether the associations between ER difficulties and hoarding remain after controlling for such confounding variables. Finally, although the sample size was reasonably large for regression-type analyses, it is possible that the non-significant results would become significant with a larger sample, particularly given the theoretical and empirical overlap between the urgency facets.

**Clinical Implications**

If supported by future investigations, the findings of the current study may have implications for the treatment of HD. For example, existing treatments such as DBT (Linehan, 1993) or ACT (S. C. Hayes et al., 1999) contain strategies for improving ER skills and the ability to tolerate emotions and inhibit impulsive behaviours in order to act in accordance with desired goals, and such approaches may be worth considering within treatment models for HD. A detailed discussion of the clinical and treatment implications of the findings of the research project is provided in the general discussion.

In summary, this preliminary study provides support for the role of emotion dysregulation and emotion-based facets of impulsivity (most prominently negative urgency), in hoarding in a non-clinical sample. Novel to this investigation was the exploration of the role of emotional attachment beliefs in the ER-hoarding relationship. Furthermore, this study represents the first known investigation of positive urgency in relation to hoarding behaviours. The following chapter addresses the second study of the research project, which aimed to replicate the findings of the current study in an independent non-clinical sample, and further extend upon these findings by investigating additional aspects of ER in relation to hoarding.
Chapter 7. Study 2: Further Investigation of Emotion Regulation Constructs and Hoarding Phenomena

On the basis of the findings from Study 1, as well as the theoretical and empirical support for additional ER constructs in relation to hoarding, Study 2 was designed to address three aims. Firstly, this study sought to replicate the findings from Study 1 in an independent non-clinical sample. Secondly, this study aimed to examine the relationships between hoarding-related phenomena and additional constructs of ER, namely EA, alexithymia, and the use of two ER strategies (i.e., expressive suppression and cognitive reappraisal). Furthermore, given the potential overlap of ER constructs, this study aimed to examine the respective contribution of multiple ER facets in the prediction of hoarding, and investigate how particular aspects of ER (i.e., alexithymia and EA) might be associated with one another in the prediction of hoarding symptoms.

As noted in Chapter 4, the ER variables investigated in this study may be implicated in hoarding behaviour in several ways. Experiential avoidance is consistent with the CBT model of hoarding (Frost & Hartl, 1996; Steketee & Frost, 2003, 2014b), which conceptualises acquiring and difficulty discarding as behaviours that serve a function of minimising internal distress. An unwillingness to experience negative internal states is likely to be predictive of behavioural symptoms of HD such saving behaviour, given that saving enables the individual to avoid distressing feelings associated with discarding (such as guilt, loss, or fear that one has made a mistake). Similarly, acquiring behaviour may serve an EA function both in terms of avoiding negative emotions associated with the prospect of not acquiring an item as well, as a strategy for avoiding the negative internal experiences elicited by the home environment. Indeed, some researchers postulate that acquiring and saving behaviour may represent an avenue through which individuals with HD engage in EA (Ayers et al., 2014). Furthermore, due to feeling anxious and overwhelmed when sorting and categorising items, individuals with HD often avoid these tasks, which may represent another form of EA. Given that clutter and disorganisation in the home is a consequence of acquisition, saving behaviour, and the abandonment of tasks of sorting and categorising, it is likely that EA is predictive of all three hoarding symptoms, although perhaps to a lesser extent with clutter.
Alexithymia may also be implicated in hoarding behaviour in several ways. As noted previously, HD shares comorbidity with GAD and MDD, and patients with these disorders exhibit greater difficulty identifying and describing feelings and greater overall alexithymia than do non-clinical controls (Leweke et al., 2011; Onur et al., 2013; Wise et al., 1995). Negative early experiences are also a known risk factor for HD (see Kyrios, 2014), and are likely to impact on an individual’s development across several domains, including affect development. Given that impaired affect development during early childhood has been implicated in the underlying deficits of alexithymia (G. J. Taylor et al., 1997), there may be a link between alexithymia and hoarding. Likewise, given the information processing deficits characteristic of HD (e.g., Blom et al., 2011; Grisham et al., 2007; Tolin & Villavicencio, 2011; Wincze et al., 2007), it is possible that individuals with HD may also experience deficits in the ability to cognitively identify and label feelings. This link however requires empirical support. The features of poor insight into symptoms and poor response to treatment often seen in HD may also reflect difficulties with identifying feelings and/or the externally-oriented thinking style feature of alexithymia. Furthermore, difficulties with identifying and describing emotions are likely to make the emotional experience feel overwhelming and will presumably impact on one’s willingness to experience or tolerate such feelings (i.e., EA), which in turn may lead to the use of avoidance-based behaviours (such as acquiring or saving) as a way of ending the emotional arousal. As such, the relationship between alexithymia and hoarding behaviours may be mediated by EA.

Given the ego-syntonic nature of HD, and the distorted appraisals individuals with HD have about their possessions and the consequences of their behaviour, it is likely that they do not habitually utilise cognitive reappraisal strategies. Furthermore, the information processing deficits typically seen with the disorder may make it harder for individuals with HD to utilise adaptive ER strategies such as cognitive reappraisal, given that implementing such strategies requires sophisticated cognitive resources. However, the link between information processing deficits and ER is tentative and requires further investigation. In contrast, expressive suppression is a form of emotional avoidance, and may be manifested in an individual’s efforts to hide or conceal their hoarding behaviour or to minimise the negative impact of their symptoms. Indeed, individuals with HD may have a tendency toward expressive suppression in attempting to manage feelings of shame and depression associated with their behaviour. Finally,
given the high comorbidity between MDD and HD, and research suggesting that individuals diagnosed with MDD or SAD use expressive suppression to a greater extent and reappraisal to a lesser extent than never-disordered individuals (D'Avanzato et al., 2013), it is likely the hoarding will be positively associated with the use of suppression and negatively associated with the use of cognitive reappraisal.

As noted in Chapter 4, empirical research on the role of EA in hoarding has revealed some inconsistent findings, and the current study aims to contribute to this literature. While there are a few studies that have provided preliminary support for an association between alexithymia and hoarding symptoms, these studies have primarily involved OCD samples and measures. An important contribution of the current study is the use of a multifaceted measure of alexithymia in relation to hoarding-specific measures, which allows for a more detailed examination of facets of alexithymia in relation to specific hoarding behaviours. This study also addresses a gap in the literature with regard to the use of specific ER strategies in relation to hoarding-related phenomena. Furthermore, a novel contribution of the current study is the exploration of the role of EA in the alexithymia-hoarding relationship.

As Study 2 aimed to replicate the findings from Study 1, hypotheses 1-4 (outlined in the previous chapter) were first tested and reported on. Subsequently, the relationships between additional aspects of ER and hoarding were examined and reported on. The hypotheses for Study 2 were:

5. Expressive suppression would be positively associated with hoarding symptoms and with hoarding beliefs, while cognitive reappraisal would be negatively associated with these measures
6. Experiential avoidance would be positively correlated with hoarding symptoms and with hoarding beliefs
7. Alexithymia would be positively correlated with hoarding symptoms and with hoarding beliefs
8. The ER factors in hypotheses 5-7 would remain significantly associated with hoarding symptoms after controlling for symptoms of depression and non-hoarding obsessive-compulsive symptoms
9. The relationship between alexithymia and hoarding would be mediated through EA
Method

Participants

Participants for Study 2 were recruited through the Research Experience Program (REP) website of an Australian university, which is a platform for advertising research studies to first year psychology undergraduates who receive course credit for participating. Participants from the general community were also recruited through social networking sites (e.g., Facebook). There were 43 participants who commenced but did not complete all measures of the study and their data was excluded from analysis. One participant was excluded from analysis due to invariable responding across all measures. The final sample comprised 178 participants, 137 females and 41 males ranging in age from 17 to 65. The overall mean sample age was 25.06 ($SD = 10.05$), with a mean age of 25.49 ($SD = 10.52$) for females and 23.63 ($SD = 8.27$) for males.

The vast majority of respondents (86%, $n = 153$) were born in Australia or New Zealand. The remainder of the sample were born in Asia (3.9%, $n = 7$), Europe (4.5%, $n = 8$), South America (1.1%, $n = 2$), North America (0.6%, $n = 1$), and Africa (1.7%, $n = 3$). Four (2.2%) participants selected ‘other’ on this question. The majority of participants (86.5%, $n = 154$) reported that they had lived in Australia for 18 years or over (range = 18 - 65), while 9.1% ($n = 16$) had lived in Australia for between 6 and 15 years, and 4.5% ($n = 8$) had lived in Australia for between 1 and 3 years. English was the main language spoken at home for the majority (91.6%, $n = 163$) of participants.

Regarding the highest education level achieved by participants, 59% of the sample ($n = 105$) reported having a high school education, 28.7% ($n = 51$) reported having a tertiary education, and 11.2% ($n = 20$) reported having vocational training. There was a further 1.1% of the sample ($n = 2$) that responded ‘other’ on this question. The vast majority (87.1%, $n = 155$) of respondents were current university students, and 80.9% of the sample ($n = 144$) completed the study as part of the first year REP.

In terms of employment status, 16.3% of the sample ($n = 29$) were employed in full time work, 21.3% ($n = 38$) in part time work, 30.4% ($n = 54$) in casual work, and 32% ($n = 57$) were unemployed. With regard to marital status, 49.4% of the respondents ($n = 88$) identified as single, 29.3% ($n = 52$) were involved in a committed relationship, and 21.3% ($n = 38$) were married or involved in a de-facto relationship.
Materials and Procedure

The research protocol was approved by the university’s human research ethics committee (SUHREC Project 2012/22). The measures for this study were uploaded to online survey software “Opinio”. Participants provided informed consent to participate in the study by clicking a button to indicate that they had read and understood the Consent Information Statement presented on the first page, prior to starting the first measure. The online survey included the same demographic questions from Study 1, followed by a number of self-report measures, including all of the measures from Study 1 (described in the previous chapter), plus several additional self-report measures (described below). A Debriefing Statement was provided at the end of the online survey. Please see Appendix E for a copy of the Ethics Clearance, Consent Information Statement, Debriefing Statement, and additional self-report measures for Study 2.

Additional emotion regulation measures.

*The Acceptance and Action Questionnaire-II* (AAQ-II; Bond et al., 2011) is a 7-item unidimensional measure of EA or psychological inflexibility. An example item is “Emotions cause problems in my life”. Participants are asked to rate how true each statement is for them using a 7-point Likert-type scale ranging from 1 (never true) to 7 (always true). Higher scores are indicative of greater levels of EA or psychological inflexibility.

Bond et al. (2011) established the psychometric properties of the 7-item version of the AAQ-II using 2,816 participants across two undergraduate samples, an outpatient psychological treatment sample, and a sample of United Kingdom retail bank employees. The 7-item version of the AAQ-II was found to have superior psychometric properties to the previous 10-item version. Reliabilities for the AAQ-II ranged from .78 - .88, and the 3- and 12-month test-retest reliabilities were .81 and .79, respectively. The scale demonstrated good concurrent and predictive validity, with higher AAQ-II scores being associated with greater depressive symptoms, greater anxiety-related symptoms, higher stress levels, greater overall psychological ill-health, and poorer life functioning (i.e., more absences from work). Longitudinally, the AAQ-II predicts greater psychological distress one-year later and more instances of full-day work absence over a one-year period. Convergent validity was established in three samples where higher scores the AAQ-II were found to be positively associated with greater levels of thought
suppression. The AAQ-II also demonstrated adequate discriminant validity as it was not significantly associated with social desirability. Although this measure was not designed to establish cut-off scores for which individuals are likely to meet criteria for a psychiatric disorder, scores in the range of 24-28 or above are associated with values indicative of psychological distress on measures of depression, general health, and symptom severity (Bond et al., 2011).

The AAQ-II has demonstrated good test-retest reliability (.74 - .85), good to excellent internal consistency (.84 - .97), and has been found to accurately differentiate clinical participants from healthy controls (Gloster, Klotsche, Chaker, Hummel, & Hoyer, 2011; Pinto-Gouveia, Gregório, Dinis, & Xavier, 2012; Ruiz, Langer Herrera, Luciano, Cangas, & Beltrán, 2013). Several different versions of the scale, such as Turkish (Meuiner et al., 2014), Italian (Pennato, Berrocal, Bernini, & Rivas, 2013), Chinese (Zhang, Chung, Gangyan, & Liu, 2014), Spanish (Ruiz et al., 2013), Dutch (Fledderus, Oude Voshaar, ten Klooster, & Bohlmeijer, 2012), and Portuguese (Pinto-Gouveia et al., 2012) have also demonstrated satisfactory psychometric properties and factor structure. In the current study, the AAQ-II demonstrated high internal consistency ($\alpha = .94$).

The Twenty-Item Toronto Alexithymia Scale (TAS-20; Bagby, Parker, et al., 1994) is the most widely used self-report measure of alexithymia. It consists of 20 items that load onto three facets: (a) difficulty identifying feelings (DIF) and distinguishing them from bodily sensations (“I am often confused about what emotion I’m feeling”); (b) difficulty describing feelings (DDF) to others (e.g., “It is difficult for me to find the right words for my feelings”); and (c) externally-oriented thinking (EOT) style (“I prefer to just let things happen rather than to understand why they turned out that way”). Participants are asked to rate their level of agreement with each statement using a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating higher levels of alexithymia. Cut-off scores have been derived for non-alexithymia (<52), borderline/possible alexithymia (52 – 60), and alexithymia (>60) (Connelly & Denney, 2007; G. J. Taylor et al., 1997).

Factor analytic studies have confirmed the three-factor structure of the TAS-20 in both clinical and non-clinical populations, with strong support for the generalizability of the three-factor structure across languages and cultures such as English, German,
Italian, French, and Swedish (Bach, Bach, de Zwaan, Serim, & Böhmer, 1996; Bagby, Parker, et al., 1994; Bressi et al., 1996; Loas et al., 2001; Parker et al., 1993; Parker, Taylor, & Bagby, 2003; Simonsson-Sarnecki et al., 2000; for a review see, G. J. Taylor, Bagby, & Parker, 2003). Good test-retest reliability has been found for the TAS-20 in non-clinical samples (e.g., Bach et al., 1996; Bagby, Parker, et al., 1994; Bressi et al., 1996), and acceptable internal consistency has been found for the total scale ($\alpha$ range = .80 - .86), the DIF subscale ($\alpha$ range = .78 - .81), and the DDF subscale ($\alpha$ range = .75 - .77), while reliabilities for the EOT subscale have tended to be lower ($\alpha$ range = .64 - .71) (Bagby, Parker, et al., 1994; Parker et al., 2003). Some research has reported alphas as low as .52 for the EOT subscale (Bressi et al., 1996).

The TAS-20 has been found to have good convergent and discriminant validity (Bach et al., 1996; Bagby, Taylor, et al., 1994). For example, significant negative correlations have been found between the TAS-20 total and all three subscales with measures of psychological mindedness, need-for-cognition, and openness to experience, and non-significantly with facets of agreeableness, conscientiousness, and excitement seeking (Bagby, Taylor, et al., 1994). Likewise, the TAS-20 correlates positively with neuroticism, external locus of control, and irrational beliefs, and negatively with extraversion and internal locus of control (Zimmermann, Rossier, de Stadelhofen, & Gaillard, 2005). Good agreement between the TAS-20 and observer ratings of alexithymia have also been found (Bagby, Taylor, et al., 1994), and the scale has been found to discriminate between individuals who perform well versus those who perform poorly on tasks designed to match verbal or nonverbal emotional stimuli with verbal or nonverbal emotional responses (Lane et al., 1996).

In the current study, the DDF subscale had acceptable internal consistency ($\alpha$ = .74), the DIF subscale had good internal consistency ($\alpha$ = .89), and TAS-20 total had good internal consistency ($\alpha$ = .85). The EOT subscale had lower reliability ($\alpha$ = .51) which is well below the acceptable level of .70. As such, only the total, DIF, and DDF subscales were used in the data analyses for the current study.

The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) is a 10-item measure of an individual’s use of two ER strategies: cognitive reappraisal and expressive suppression. Five items load onto the reappraisal subscale (e.g., “I control my emotions by changing the way I think about the situation I’m in”) and four items
load onto the suppression subscale (e.g., “I control my emotions by not expressing them”). Each subscale contains at least one item asking about regulating negative emotion and one item about regulating positive emotion. Participants rate their level of agreement with each statement on a Likert-type scale from 1 (strongly disagree) to 7 (strongly agree), with higher scores indicating greater use of reappraisal and suppression (Gross & John, 2003).

The two-factor structure of the ERQ has been confirmed across samples of young and older adults with each subscale demonstrating adequate to good internal consistency (e.g., Abler & Kessler, 2009; Balzarotti et al., 2010; Cabello et al., 2013; Gross & John, 2003; Melka et al., 2011; Moore et al., 2008) and test-retest reliability (Cabello et al., 2013; Gross & John, 2003). Furthermore, the correlation between the two subscales tends to be close to zero (e.g., Balzarotti et al., 2010; Gross & John, 2003; Melka et al., 2011; Moore et al., 2008), lending support to the notion that these are two independent regulatory strategies that different individuals use to different degrees (Gross & John, 2003).

Support for convergent and discriminant validity has been demonstrated (Cabello et al., 2013; Gross & John, 2003). With regard to convergent validity, reappraisal is associated with coping through reinterpretation, while suppression is correlated with coping through venting. Suppression is positively associated with rumination and inauthenticity, but not with reappraisal, and negative mood regulation efficacy is positively associated with reappraisal and negatively associated with suppression (Gross & John, 2003). With regard to discriminant validity, reappraisal is negatively associated with neuroticism while suppression is negatively associated with extraversion. Furthermore, neither suppression nor reappraisal are related to measures of cognitive ability, social desirability, or ego control (Gross & John, 2003). Support for the incremental validity of the scale has been demonstrated in a recent study by Ioannidis and Siegling (2015) which found that reappraisal was predictive of positive affect beyond the Big Five personality facets, while suppression was predictive of negative affect beyond the Big Five personality facets. Furthermore, reappraisal accounted for significant incremental variance in experiential flexibility and constructive self-assertion beyond personality, while suppression accounted for significant incremental variance in experiential flexibility (negatively) beyond personality (Ioannidis & Siegling, 2015).
Cronbach’s alphas range from .75 - .86 for the reappraisal subscale, and .68 - .83 for the suppression subscale (Balzarotti et al., 2010; Cabello et al., 2013; Gross & John, 2003; Melka et al., 2011; Moore et al., 2008). In the current study, the reappraisal subscale demonstrated excellent internal consistency ($\alpha = .90$), while the suppression subscale demonstrated good internal consistency ($\alpha = .84$).

Results

Overview of Data Analyses

As per Study 1, the data was analysed using IBM SPSS 21, and was initially screened for missing values and out of range scores. Given the findings from Study 1 regarding the factor structure of the DERS, an exploratory factor analysis was conducted to assess the factor structure in the current sample. Assumption testing was conducted prior to all statistical analyses and descriptive statistics were calculated for all variables of interest. The data analyses conducted for Study 1 were repeated for Study 2 to test whether findings were replicated across studies. Next, correlational analyses were performed to explore the relationships between additional ER constructs (i.e., TAS-20, AAQ-II, ERQ) and hoarding-related phenomena, and a series of hierarchical multiple regression analyses were conducted to assess the ability of these ER constructs to predict hoarding symptoms after controlling for covariates. In addition, a hierarchical multiple regression analysis was conducted to concurrently examine the contribution of multiple ER constructs in the prediction of hoarding. Finally, a mediation analysis was performed to test the indirect effect of alexithymia on hoarding through EA.

Data Screening

Prior to statistical analyses descriptive statistics and frequency tables were produced and examined for missing values, correct minimum and maximum values, and out of range scores. There were no missing values on any of the questionnaire data, as the online survey was designed to prompt participants to complete any unanswered questions before being allowed to progress to the next section. All data were in the expected range on all variables.
Exploratory Factor Analysis

Given that the DERS (Gratz & Roemer, 2004) in Study 1 did not replicate the theoretical factor structure, it was decided to examine the DERS in the independent non-clinical sample of Study 2. Initially, the suitability of data for performing factor analysis was assessed. As a sample size of at least 150 or a ratio of 5 cases for each item is usually deemed adequate for performing PCA (Tabachnick & Fidell, 2013), the current data meets the former, but not the latter requirement. However, given that the ratio guideline would require a sample size of 180, the current sample size of 178 was considered adequate.

The same procedure as described in Study 1 was followed for the PCA, and yielded the same pattern of results. That is, the items of the DERS did not correspond with their proposed theoretical factors, and further tests suggested retaining two factors. However, similar to the findings from Study 1, an inspection of the rotated two-factor solution showed that Component 2 was comprised entirely of the reverse-scored items of the scale and therefore included all items from the lack of emotional awareness subscale. Consistent with the findings from Study 1, most of the reverse-scored items from the other subscales also loaded onto factor one, and therefore, it was decided to retain the DERS total (MA) variable\(^2\) for Study 2. For a more detailed description of the statistical results of this PCA, please refer to Appendix F.

Assumption Testing

Following data screening, assumption testing was carried out for the relevant statistical analyses. Normality was assessed via inspection of histograms, box plots, and normal probability plots, and noting skewness and kurtosis values above the \(\alpha = .001\) significance level of 3.29 (Tabachnick & Fidell, 2013). Univariate outliers were also assessed through histograms, box plots, most extreme values, and \(z\) scores for each variable, particularly noting \(z\) scores above the \(\alpha = .001\) significance level of 3.29 (Tabachnick & Fidell, 2013).

Using these statistical methods, many variables in the current study demonstrated violations of normality and had univariate outliers. Most variables were positively skewed, reflecting a concentration of low scores as expected for a non-

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\(^2\) A factor analysis was also performed using Principal Axis Factoring (PAF) on the 36 items of the DERS which revealed a similar pattern of results. Removing the six items of the lack of awareness subscale and subjecting the 30 items of the DERS to PAF also did not result in items falling in their theoretical factors.
clinical sample. As displayed in Table 9, skewed variables were transformed via either a square root or logarithm transformation, after which all variables met the assumption of normality and had no extreme outliers, with the exception of age and the emotional attachment subscale of the SCI. Similar to Study 1, the age variable could not be used as a control in the current study given that even after transformations this variable had a non-normal distribution, univariate outliers, and residual plots indicating violations of assumptions. However, the emotional attachment subscale was retained for analyses given that after transformation there were no univariate outliers and residual plots did not reveal any violation of assumptions, although this should be taken into consideration when interpreting the correlations involving this variable. Other than those raw variables that did not violate assumptions, the transformed variables were used for all data analyses (see Table 9).

**Descriptive Data**

Means, standard deviations, and internal consistencies, along with the observed and possible ranges for each of the variables in Study 2 are presented in Table 10. The mean scores and range on all measures in the current study were consistent with previous research using non-clinical samples (e.g., Bardeen et al., 2012; Bond et al., 2011; Cyders, 2013; Frost et al., 2004; Hajcak et al., 2004; Parker et al., 2003; Steketee & Frost, 2014b; Steketee et al., 2003; Timpano et al., 2009; A. D. Williams & Grisham, 2012). All scales demonstrated adequate internal consistencies for the current study. Overall, the means obtained for these measures in the current study were consistent with, although slightly higher than those obtained in Study 1. *T*-tests were completed to check for statistical differences across Study 1 and 2 on these measures. No significant differences were found between the means across the two non-clinical studies, with the exception of the positive urgency subscale of the UPPS-P, which was found to be significantly higher for Study 2, *t*(375)=3.26, *p* = .001.
Table 9

Transformations for Study 2 Variables

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<thead>
<tr>
<th>Variable</th>
<th>Violation</th>
<th>Transformation Performed</th>
<th>Assumption Met</th>
<th>Variable Used in Analyses</th>
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Note: Pos Skew=positively skewed; SQRT=square root transformation; LG10=logarithm 10 transformation; DASS-21 Dep=Depression subscale of the Depression, Anxiety, and Stress Scales-21; OCIR-NH=Obsessive Compulsive Inventory Revised Non-Hoarding variable; SI-R=Savings Inventory Revised; Clut=Excessive Clutter; Acq=Excessive Acquisition; Disc=Difficulty Discarding; SCI=Saving Cognitions Inventory; EmAttach=Emotional Attachment to Possessions; DERS Tot (MA)=Difficulties in Emotion Regulation Scale Total Minus Awareness subscale; UPPS-P=UPPS-P Impulsive Behavior Scale; NU=Negative Urgency; PU=Positive Urgency; AAQ-II=Acceptance and Action Questionnaire II; ERQ=Emotion Regulation Questionnaire; Supp=Expressive Suppression; Reapp=Cognitive Reappraisal; TAS-20=Toronto Alexithymia Scale; DIF=Difficulty Identifying Feelings; DDF=Difficulty Describing Feelings.
Table 10

Study 2 Means, Standard Deviations, Internal Consistencies, and Scale Ranges

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<th></th>
<th>M</th>
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<th>Possible Range</th>
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<td>SI-R Discarding</td>
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<td>SCI EmAttach</td>
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Note: N=178

α=Cronbach's alpha; SI-R=Savings Inventory Revised; Clutter=Excessive Clutter; Acquisition=Excessive Acquisition; Discarding=Difficulty Discarding; SCI=Saving Cognitions Inventory; EmAttach=Emotional Attachment to Possessions; DASS-21=Depression, Anxiety, and Stress Scales; OC Symptoms=Obsessive Compulsive Symptoms; OCIR-NH=Obsessive Compulsive Inventory Revised Non-Hoarding variable; DERS Total (MA)=Difficulties in Emotion Regulation Scale Total Minus Awareness subscale; AAQ-II=Acceptance and Action Questionnaire II; ERQ=Emotion Regulation Questionnaire; Suppression=Expressive Suppression; Reappraisal=Cognitive Reappraisal; TAS-20=Toronto Alexithymia Scale; DDF=Difficulty Describing Feelings; DIF=Difficulty Identifying Feelings; UPPS-P=UPPS-P Impulsive Behavior Scale; NU=Negative Urgency; PU=Positive Urgency.
Emotion Regulation Difficulties and Hoarding

As for Study 1 data analyses, Pearson’s correlations were performed to examine the associations between ER difficulties and hoarding, and are presented in Table 11. Emotion regulation difficulties, as measured by DERS total (MA), were positively associated with hoarding symptoms. Specifically, a strong positive correlation was found between ER difficulties and the total and acquisition subscale of the SI-R, while the clutter and difficulty discarding subscales demonstrated moderate positive associations with ER difficulties. There was also a strong positive association between the DERS total (MA) and hoarding beliefs, as measured by the SCI total and emotional attachment subscale. As such, the first hypothesis was fully supported.

To test whether difficulties in ER are predictive of hoarding symptoms over and above symptoms of depression and non-hoarding obsessive-compulsive symptoms in the current study, the following variables were entered into a hierarchical multiple regression in stepwise order: (1) DASS-21 depression; (2) OCIR-NH; and (3) DERS total (MA) for each of the dependent variables (i.e., SI-R total, difficulty discarding, acquisition, and clutter). Two multivariate outliers were identified and excluded from each of the hierarchical regression analyses. Although DERS total (MA) was strongly correlated with both depression ($r = .61$) and non-hoarding obsessive-compulsive symptoms ($r = .57$) there were no issues of multicollinearity (see Table G1 in Appendix G for intercorrelations matrix for all Study 2 variables of interest). The Tol statistic ranged from .46 to .62. There were no violations of normality, linearity, or homoscedasticity.

The results from this series of hierarchical multiple regression analyses are displayed in Table 12. After controlling for general depressive and non-hoarding obsessive-compulsive symptoms, ER difficulties contributed significant additional variance in total hoarding symptoms (3%), and symptoms of difficulty discarding (2%), acquisition (2%), and clutter (2%). In each of the final models, both DERS total (MA) and OCIR-NH were found to be significant predictors. As such, Hypothesis 3 was fully supported with regard to the relationship between ER difficulties and hoarding symptoms.
Table 11

*Study 2 Pearson’s Correlations for Hoarding Symptoms, Hoarding Beliefs, ER Difficulties, and Negative and Positive Urgency*

<table>
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<tr>
<th></th>
<th>SI-R</th>
<th>SCI</th>
<th>DERS</th>
<th>UPPS-P</th>
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<td>Total Clut Disc Acq</td>
<td>Total EmAttach</td>
<td>Total (MA) NU</td>
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<tr>
<td>Clut</td>
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<tr>
<td>Disc</td>
<td>.91***</td>
<td>.69***</td>
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</tr>
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<td>Acq</td>
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<td>.77***</td>
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</tr>
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<td>.61***</td>
<td>.63***</td>
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<td>.44***</td>
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<td>.52***</td>
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<td>NU</td>
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<td>.34***</td>
<td>.44***</td>
<td>.50***</td>
</tr>
<tr>
<td>PU</td>
<td>.43***</td>
<td>.36***</td>
<td>.37***</td>
<td>.45***</td>
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</table>

Note: N=178. *** p<.001, ** p<.01, * p<.05 (two-tailed)
SI-R= Savings Inventory Revised; Clut= Excessive Clutter; Disc= Difficulty Discarding; Acq= Excessive Acquisition; SCI= Saving Cognitions Inventory; EmAttach= Emotional Attachment to Possessions; DERS Total (MA)= Difficulties in Emotion Regulation Scale Total Minus Awareness subscale; UPPS-P= UPPS-P Impulsive Behavior Scale; NU= Negative Urgency; PU= Positive Urgency.
Table 12
Summary of Study 2 Hierarchical Multiple Regression Analyses for Difficulties in ER Predicting Hoarding Symptoms after Controlling for Covariates

Note: N=176. ***p<.001, ** p<.01, * p<.05 (two-tailed)
SI-R=Savings Inventory Revised; Discarding=Difficulty Discarding; Acquisition=Excessive Acquisition; Clutter=Excessive Clutter; DASS-21=Depression Anxiety and Stress Scales 21; Dep=Depression; OCIR-NH=Obsessive Compulsive Inventory Revised Non-Hoarding Symptoms; DERS Total (MA)=Difficulties in Emotion Regulation Scale Total Minus Awareness subscale.

<table>
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<tr>
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<th>SE B</th>
<th>β</th>
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<th>p</th>
<th>sr²</th>
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<td>.14</td>
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<td>.000</td>
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<tr>
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Facets of Urgency and Hoarding

As shown in Table 11, positive urgency was moderately positively associated with total hoarding symptoms and symptoms of clutter, difficulty discarding, and acquisition. Negative urgency demonstrated the same pattern of results, although the correlation with the acquisition subscale was of a strong magnitude. As for Study 1, negative urgency tended to be more strongly associated with hoarding symptoms than positive urgency. Hoarding beliefs, as measured by SCI total, demonstrated a strong positive correlation with negative urgency, and a moderate positive association with positive urgency. Similarly, emotional attachment beliefs were associated with both urgency facets, demonstrating a moderate correlation with negative urgency, and a strong correlation with positive urgency. As such, Hypothesis 2 was fully supported.

A series of hierarchical multiple regression analyses were conducted to test the contribution of negative and positive urgency in the prediction of hoarding symptoms over-and-above symptoms of depression and non-hoarding obsessive-compulsive symptoms. The following variables were added in a stepwise order: (1) DASS-21 depression; (2) OCIR-NH; and (3) the Negative Urgency and Positive Urgency subscales of the UPPS-P for each of the dependent variables (i.e., SI-R total, difficulty discarding, acquisition, clutter). For each of the analyses one multivariate outlier was identified and excluded. There were no violations of the assumptions of normality, linearity, or homoscedasticity. Although negative and positive urgency were strongly correlated with one another in the current study \( r = .69 \), there were no issues of multicollinearity, as the Tol statistic ranged from .46 to .72. The results are displayed in Table 13, and demonstrate that Step 3 was significant for all models. That is, after controlling for depressive and non-hoarding obsessive-compulsive symptoms, negative and positive urgency explained an additional 5% of the variance in total hoarding symptoms and symptoms of difficulty discarding, an additional 7% of the variance in acquisition, and an additional 3% of the variance in clutter. Negative urgency, DASS-21 depression and OCIR-NH were unique significant predictors of overall hoarding symptoms, while negative urgency and OCIR-NH were unique significant predictors of symptoms of acquisition and difficulty discarding. With regard to clutter, only DASS-21 depression and OCIR-NH were unique significant predictors of clutter.

---

3 Negative and positive urgency were also separately investigated in a series of hierarchical multiple regression analyses predicting hoarding symptoms after controlling for covariates. The results replicated the findings of Study 1, with one exception; in contrast to Study 1, the model for positive urgency predicting clutter was significant in the current study, and positive urgency was found to be a unique significant predictor of clutter.
Table 13

Summary of Study 2 Hierarchical Multiple Regression Analyses for Negative and Positive Urgency Simultaneously Predicting Hoarding after Controlling for Covariates

<table>
<thead>
<tr>
<th>Step</th>
<th>Predictor Variables</th>
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<th>SE B</th>
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<th>t</th>
<th>p</th>
<th>sr²</th>
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Note: N=177
***p<.001, **p<.01, *p<.05 (two-tailed)
SI-R=Savings Inventory Revised; Discarding=Difficulty Discarding; Acquisition=Excessive Acquisition; Clutter=Excessive Clutter; DASS-21=Depression Anxiety and Stress Scales 21; Dep=Depression; OCIR-NH=Obsessive Compulsive Inventory Revised Non-Hoarding Symptoms; Negative Urgency= Negative Urgency subscale of the UPPS-P Impulsive Behavior Scale; Positive Urgency=Positive Urgency subscale of the UPPS-P Impulsive Behavior Scale.
Emotional Attachment Beliefs in the ER-Hoarding Relationship

To test whether emotional attachment beliefs mediated the relationship between ER difficulties and hoarding symptoms, a mediation model using transformed variables was conducted through SPSS 21 via the Preacher and Hayes ‘Indirect’ macro (Preacher & Hayes, 2008) using the same procedure described in Study 1. The mediation model with unstandardized B weights is illustrated in Figure 2. Emotion regulation difficulties were positively associated with hoarding symptoms (B = 3.41, t(174) = 3.33, p < .01), and positively associated with emotional attachment beliefs (B = 0.52, t(174) = 4.03, p < .001). The mediator, emotional attachment beliefs, was positively associated with hoarding symptoms (B = 3.86, t(174) = 7.34, p < .001). The bootstrapped estimates were used to examine the indirect effect of ER difficulties (DERS total MA) on hoarding symptoms (SI-R total) via emotional attachment beliefs (SCI EmAttach). The bootstrapped estimates indicated that the indirect effect was statistically significant (B = 1.99; 95% CI = 0.78 to 3.66). As the direct effect of ER difficulties on hoarding behaviour became non-significant when controlling for emotional attachment beliefs (B = 1.40, t(173) = 1.49, p = .137), this suggests full mediation.

Figure 2. Indirect effect of ER difficulties on hoarding symptoms through emotional attachment beliefs for Study 2.

Note: N=178. ***p<.001, **p<.01,*p<.05
Dashed line represents c’ pathway
Overall $R^2 = 0.54$. Depression and non-hoarding obsessive-compulsive symptoms included as covariates, but not depicted here.

These results demonstrate that the relationship between ER difficulties and hoarding symptoms was fully mediated by beliefs about emotional attachment to possessions, which supports hypothesis 4.

4 A similar pattern of results was found when using SCI total as the mediator, indicating that the relationship between ER difficulties and hoarding was fully mediated by overall saving beliefs.
In sum, the replication of Study 1 data analyses in the current sample demonstrated results that were consistent with those reported for Study 1, with a few additional findings. The current study replicated the results of Study 1 with regard to ER difficulties significantly predicting hoarding symptoms (i.e., total, acquisition, difficulty discarding) above-and-beyond general symptoms of depression and non-hoarding obsessive-compulsive symptoms. However, DERS total (MA) was also found to be a unique significant predictor of clutter after controlling for covariates in the current study. The current results are consistent with the findings from Study 1 which found that, when considering two facets of urgency simultaneously in the prediction of hoarding symptoms, negative urgency emerged as a unique significant predictor of overall hoarding symptoms and symptoms of acquisition and difficulty discarding, after controlling for covariates. While negative and positive urgency did not significantly predict clutter after controlling for covariates in Study 1, the current study found a significant model for clutter. However, neither urgency facet was a unique significant predictor in the final model. When considering negative and positive urgency separately, the findings of the current study replicated those of Study 1, although in addition, the current study found that positive urgency was a unique significant predictor of clutter. Finally, emotional attachment beliefs were found to fully mediate the effect of ER difficulties on hoarding symptoms, and the same pattern of results was found when using overall saving cognitions as the mediator. These findings are consistent with Study 1, although the current study found support for full, rather than partial, mediation.

**Emotion Regulation Strategies and Hoarding**

Pearson’s correlations were performed to explore the associations between hoarding-related phenomena and the use of cognitive reappraisal and expressive suppression ER strategies. As shown in Table 14, the cognitive reappraisal subscale of the ERQ was not significantly negatively associated with hoarding symptoms or saving cognitions. Also contrary to expectations, expressive suppression was not significantly positively associated with hoarding symptoms. While expressive suppression was significantly associated with saving cognitions and emotional attachment beliefs, these correlations were of a weak magnitude. Overall, hypothesis 5 was not supported. Given
these findings, and that neither subscale of the ERQ was predictive of hoarding symptoms in a simple linear regression, the ERQ was excluded from further analyses.

**Experiential Avoidance and Hoarding**

As shown in Table 14, EA, as measured by the AAQ-II, was moderately positively correlated with the clutter, difficulty discarding, and acquisition facets of the SI-R, and strongly positively associated with total hoarding symptoms, saving cognitions, and emotional attachment beliefs. As such, hypothesis 6 was fully supported.

To test whether the relationship between EA and hoarding symptoms remained after controlling for relevant covariates, the following variables were added in stepwise order into a series of hierarchical multiple regression analyses: (1) DASS-21 depression; (2) OCIR-NH; and (3) the AAQ-II, for each of the dependent variables (i.e., SI-R total, difficulty discarding, acquisition, clutter). There were two multivariate outliers identified and removed from these analyses, after which there were no violations of the assumptions of normality, linearity, or homoscedasticity, and no issues of multicollinearity.

The results of these analyses are presented in Table 15. For the model predicting total hoarding symptoms, DASS-21 depression explained 18% of the variance, $R^2 = .18$, $F_{change} (1, 174) = 37.83$, $p < .001$. Non-hoarding obsessive-compulsive symptoms explained an additional 17% of the variance in hoarding, $R^2_{change} = .17$, $F_{change} (1, 173) = 46.27$, $p < .001$. After entering the AAQ-II at Step 3, the total variance explained by the model as a whole was 40%, $F(3, 172) = 38.43$, $p < .001$. Experiential avoidance explained an additional 5% of the variance in hoarding symptoms, after controlling for covariates, $R^2_{change} = .05$, $F_{change} (1, 172) = 14.18$, $p < .001$. As shown in Table 15, EA was also significantly associated with the difficulty discarding, acquisition, and clutter subscales after controlling for covariates, explaining an additional 4%, 2%, and 4% of the variance in each subscale, respectively. In the final models, OCIR-NH and AAQ-II were unique significant predictors of SI-R total, and all three hoarding symptom dimensions. As such, hypothesis 8 was fully supported with regard to the relationship between EA and hoarding symptoms.
Table 14

Study 2 Pearson’s Correlations for Hoarding Symptoms, Hoarding Beliefs, ER Strategies, Experiential Avoidance, and Alexithymia

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<tr>
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<th>TAS-20</th>
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<td>Total EmAtt</td>
<td>Total</td>
<td>Total DDF DIF</td>
<td>Total Supp</td>
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<tr>
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<td>.51*** .44***</td>
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<td>.94***</td>
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<td>.26**</td>
<td>.43*** .46***</td>
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<td>.02 - .06</td>
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Note: N=178. *** p<.001, ** p<.01, * p<.05 (two-tailed)
SI-R=Savings Inventory Revised; Clut=Excessive Clutter; Disc=Difficulty Discarding; Acq=Excessive Acquisition; SCI=Saving Cognitions Inventory; EmAtt=Emotional Attachment to Possessions; DERS Total (MA)= Difficulties in Emotion Regulation Scale Total Minus Awareness subscale; AAQ-II=Acceptance and Action Questionnaire II; TAS-20=Toronto Alexithymia Scale; DDF=Difficulty Describing Feelings; DIF=Difficulty Identifying Feelings; ERQ=Emotion Regulation Questionnaire; Supp=Expressive Suppression; Reapp=Cognitive Reappraisal.
Table 15

*Summary of Hierarchical Multiple Regression Analyses for Experiential Avoidance Predicting Hoarding Symptoms after Controlling for Covariates*

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<td>.097</td>
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<td>.29</td>
<td>3.77</td>
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<td>.049</td>
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</tbody>
</table>

\[ R^2 = .40 \quad \Delta R^2 = .05 \quad \Delta F = 14.18^{***} \]

|      | SI-R Discarding     |     |      |     |     |      |     |
| 1    | DASS-21 Depression  | .07 | .06  | .09 | 1.06| .289 | .005|
| 2    | OCIR-NH             | .21 | .06  | .29 | 3.74| .000 | .058|
| 3    | AAQ-II              | .30 | .10  | .26 | 3.10| .002 | .040|

\[ R^2 = .28 \quad \Delta R^2 = .04 \quad \Delta F = 9.63^{**} \]

|      | SI-R Acquisition    |     |      |     |     |      |     |
| 1    | DASS-21 Depression  | .06 | .05  | .09 | 1.22| .225 | .005|
| 2    | OCIR-NH             | .26 | .04  | .42 | 5.85| .000 | .126|
| 3    | AAQ-II              | .19 | .07  | .20 | 2.50| .014 | .023|

\[ R^2 = .36 \quad \Delta R^2 = .02 \quad \Delta F = 6.23^{*} \]

|      | SI-R Clutter        |     |      |     |     |      |     |
| 1    | DASS-21 Depression  | .09 | .07  | .10 | 1.20| .232 | .006|
| 2    | OCIR-NH             | .22 | .06  | .27 | 3.50| .001 | .052|
| 3    | AAQ-II              | .34 | .11  | .27 | 3.11| .002 | .041|

\[ R^2 = .28 \quad \Delta R^2 = .04 \quad \Delta F = 9.69^{**} \]

Note: N=176. *** p<.001, ** p<.01, * p<.05 (two-tailed)
SI-R=Savings Inventory Revised; Discarding=Difficulty Discarding; Acquisition=Excessive Acquisition; Clutter=Excessive Clutter; DASS-21=Depression Anxiety and Stress Scales 21; Dep=Depression; OCIR-NH=Obsessive Compulsive Inventory Revised Non-Hoarding Symptoms; AAQ-II=Acceptance and Action Questionnaire II.
Alexithymia and Hoarding

As displayed in Table 14, alexithymia, as measured by the TAS-20 total, was moderately positively correlated with total hoarding symptoms and all three subscales of the SI-R. The DDF facet of alexithymia demonstrated moderate positive correlations with the SI-R total, difficulty discarding, and acquisition subscales, and a weak positive association with the clutter subscale. The DIF subscale of the TAS-20 was strongly positively correlated with total hoarding symptoms, and demonstrated moderate positive correlations with all three subscales of the SI-R. Furthermore, saving cognitions and emotional attachment beliefs were found to be strongly positively associated with the TAS-20 total and DIF subscale, and moderately positively associated with the DDF subscale. The results showed that the DIF facet was the one most strongly associated with hoarding symptoms and cognitions, even more so than the total scale. These results demonstrate that hypothesis 7 was fully supported.

To test whether the relationship between alexithymia and hoarding symptoms remained after controlling for relevant covariates, the following variables were added in stepwise order into a series of hierarchical multiple regression analyses: (1) DASS-21 depression; (2) OCIR-NH; and (3) the DIF and DDF subscales of the TAS-20, for each of the dependent variables (i.e., SI-R total, difficulty discarding, acquisition, clutter). There were two multivariate outliers identified and removed from these analyses. Despite high correlations between the two TAS-20 subscales ($r = .75$), there were no issues of multicollinearity according to Tol values. There were no violations of the assumptions of normality, linearity, or homoscedasticity for these analyses.

In the hierarchical multiple regression analysis predicting total hoarding symptoms, DASS-21 depression explained 19% of the variance, $R^2 = .19$, $F_{\text{change}} (1, 174) = 42.44, p < .001$. Non-hoarding obsessive-compulsive symptoms explained an additional 19% of the variance in hoarding, $R^2_{\text{change}} = .19$, $F_{\text{change}} (1, 173) = 51.94, p < .001$. After entering the DIF and DDF subscales at Step 3, the total variance explained by the model as a whole was 41%, $F(4, 171) = 29.31, p < .001$. Alexithymia explained an additional 3% of the variance in hoarding symptoms, after controlling for depression and non-hoarding obsessive-compulsive symptoms, $R^2_{\text{change}} = .03$, $F_{\text{change}} (2, 171) = 3.61, p < .05$. As seen in Table 16, all predictors except DDF were unique significant predictors of total hoarding symptoms. Alexithymia was also significantly associated with the difficulty discarding and clutter subscales after controlling for depression and
non-hoarding obsessive-compulsive symptoms, explaining an additional 4% of the variance in each subscale. Both OCIR-NH and DIF were found to be significant predictors of difficulty discarding and clutter. Although the total model for acquisition was significant, \( F(4, 171) = 25.02, p < .001 \), the DIF and DDF subscales of alexithymia were not significantly predictive of acquisition after controlling for depression and non-hoarding obsessive-compulsive symptoms. As such, with regard to the relationship between alexithymia and hoarding symptoms, hypothesis 8 was partially supported.
Table 16
Summary of Hierarchical Multiple Regression Analyses for Alexithymia Predicting Hoarding Symptoms after Controlling for Covariates

Note: N=176. *** p<.001, ** p<.01, * p<.05 (two-tailed)
SI-R=Savings Inventory Revised; Discarding=Difficulty Discarding; Acquisition=Excessive Acquisition; Clutter=Excessive Clutter; DASS-21=Depression Anxiety and Stress Scales 21; Dep=Depression; OCIR-NH=Obsessive Compulsive Inventory Revised Non-Hoarding Symptoms; DDF=TAS-20 Difficulty Describing Feelings subscale; DIF=TAS-20 Difficulty Identifying Feelings subscale

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<th>Predictor Variables</th>
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<th>SE B</th>
<th>β</th>
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<th>p</th>
<th>sr²</th>
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<tr>
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<td></td>
<td><strong>ΔF = 3.61⁺</strong></td>
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<td>.06</td>
<td>.11</td>
<td>1.41</td>
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<td>.008</td>
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<td>3</td>
<td>DIF</td>
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<tr>
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<td><strong>ΔR² = .04</strong></td>
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<tr>
<td></td>
<td><strong>ΔF = 4.49⁺</strong></td>
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<tr>
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<td><strong>Dependent variable SI-R Acquisition</strong></td>
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</tr>
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<td>.005</td>
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<td>.01</td>
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<td></td>
<td><strong>ΔR² = .01</strong></td>
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<tr>
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<td>3.51</td>
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<td>.051</td>
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<tr>
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<td><strong>ΔR² = .04</strong></td>
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<td></td>
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<tr>
<td></td>
<td><strong>ΔF = 4.54⁺</strong></td>
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</table>

Note: N=176. *** p<.001, ** p<.01, * p<.05 (two-tailed)
SI-R=Savings Inventory Revised; Discarding=Difficulty Discarding; Acquisition=Excessive Acquisition; Clutter=Excessive Clutter; DASS-21=Depression Anxiety and Stress Scales 21; Dep=Depression; OCIR-NH=Obsessive Compulsive Inventory Revised Non-Hoarding Symptoms; DDF=TAS-20 Difficulty Describing Feelings subscale; DIF=TAS-20 Difficulty Identifying Feelings subscale
Multiple Constructs of Emotion Regulation and Hoarding

A final regression analysis was conducted to explore the unique contributions of the multiple measures of ER used in this study in the prediction of overall hoarding symptoms. There were no violations of the assumptions of normality, linearity, or homoscedasticity, and no issues of multicollinearity for this analysis. An initial regression analysis was conducted where the following variables were entered simultaneously as predictors of SI-R total: DERS total (MA), AAQ-II, the Negative and Positive Urgency subscales of the UPPS-P, and the DIF and DDF subscales of the TAS-20. The model was significant, indicating that these ER variables explained 37% of the variance in total hoarding symptoms, \( F(6, 171) = 16.64, p < .001 \). In the final model, DERS total (MA) and DIF were found to be unique significant predictors of overall hoarding symptoms. However, it should be noted that re-running this analysis with covariates included (i.e., DASS-21 depression and OCIR-NH) changed the pattern of unique significant predictors. As shown in Table 17, after controlling for covariates, the ER variables contributed an additional 6% of the variance in hoarding symptoms, \( R^2_{\text{change}} = .06, F_{\text{change}} (6, 167) = 2.85, p < .05 \). However, in the final model, the only unique significant predictor was OCIR-NH, with no ER variables contributing unique significant variance to hoarding symptoms.
Table 17
Summary of Regression Analysis for Examining Multiple Facets of ER in Predicting Hoarding Symptoms after Controlling for Covariates

<table>
<thead>
<tr>
<th>Step</th>
<th>Predictor Variables</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>sr²</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>DASS-21 Depression</td>
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<td>.09</td>
<td>.07</td>
<td>.93</td>
<td>.352</td>
<td>.003</td>
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<tr>
<td>2</td>
<td>OCIR-NH</td>
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<td>.08</td>
<td>.33</td>
<td>4.21</td>
<td>.000</td>
<td>.060</td>
</tr>
<tr>
<td>3</td>
<td>DERS Total (MA)</td>
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<td>1.30</td>
<td>.09</td>
<td>.90</td>
<td>.371</td>
<td>.003</td>
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<td></td>
<td>AAQ-II</td>
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<td>.14</td>
<td>.14</td>
<td>1.57</td>
<td>.118</td>
<td>.008</td>
</tr>
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<td>.06</td>
<td>.68</td>
<td>.500</td>
<td>.002</td>
</tr>
<tr>
<td></td>
<td>PU</td>
<td>.60</td>
<td>.63</td>
<td>.08</td>
<td>.95</td>
<td>.344</td>
<td>.003</td>
</tr>
<tr>
<td></td>
<td>DIF</td>
<td>.27</td>
<td>.27</td>
<td>.12</td>
<td>1.01</td>
<td>.316</td>
<td>.003</td>
</tr>
<tr>
<td></td>
<td>DDF</td>
<td>-.04</td>
<td>.04</td>
<td>-.09</td>
<td>-.99</td>
<td>.320</td>
<td>.003</td>
</tr>
</tbody>
</table>

$R^2 = .44 \quad \Delta R^2 = .06 \quad \Delta F = 2.85^*$

Note: N=176.
SI-R=Savings Inventory Revised; DERS Total (MA)=Difficulties in Emotion Regulation Scale Total Minus Awareness subscale; AAQ-II=Acceptance and Action Questionnaire II; Negative Urgency=Negative Urgency subscale of the UPPS-P Impulsive Behavior Scale; Positive Urgency=Positive Urgency subscale of the UPPS-P Impulsive Behavior Scale; DIF=TAS-20 Difficulty Identifying Feelings subscale; DDF=TAS-20 Difficulty Describing Feelings subscale.

Experiential Avoidance in the Alexithymia-Hoarding Relationship

To test whether EA mediated the relationship between alexithymia and hoarding symptoms, a mediation model using transformed variables was conducted through SPSS 21 via the Preacher and Hayes ‘Indirect’ macro (Preacher & Hayes, 2008) using the same procedure described in Study 1. Given the previous results demonstrating that the DIF facet of alexithymia was most strongly and uniquely associated with hoarding symptoms, this subscale was used as the independent variable. The mediation model with unstandardized B weights is illustrated in Figure 3. First, it was found that DIF was positively associated with hoarding symptoms ($B = .60, t(174) = 3.25, p <.01$). It was also found that DIF was positively associated with EA ($B = .75, t(174) = 7.29, p <.001$). Finally, the mediator, EA, was positively associated with hoarding symptoms ($B = .32, t(174) = 2.37, p <.05$). The bootstrapped estimates were used to examine the indirect effect of difficulty identifying feelings (DIF) on hoarding symptoms (SI-R total) via EA (AAQ-II), and indicated that the indirect effect was statistically significant ($B = .24;$
95% CI = .07 to .50). As the direct effect of DIF on hoarding behaviour became non-significant when controlling for EA (B = .36, t(173) = 1.74, p = .084), this suggests full mediation. Given that EA fully mediated the alexithymia-hoarding relationship\(^5\), Hypothesis 9 was supported.

Figure 3. Indirect effect of difficulty identifying feelings on hoarding symptoms through experiential avoidance.

Note: N=178. ***p<.001, **p<.01, *p<.05
Dashed line represents c’ pathway
Overall R\(^2\) = 0.41. Depression and non-hoarding obsessive-compulsive symptoms included as covariates, but not depicted here.

\(^5\) The same pattern of results was found when using TAS-20 total as the independent variable.
Discussion

In the context of the preliminary findings from Study 1, and the theoretical and empirical support for additional ER constructs in relation to hoarding, the current study aimed to further investigate the role of ER in relation to hoarding. Firstly, this study sought to replicate the findings from Study 1 in an independent non-clinical sample. Secondly, this study investigated the relationships between hoarding-related phenomena and some additional aspects of ER, namely EA, alexithymia, and the use of two ER strategies (i.e., cognitive reappraisal and expressive suppression). Furthermore, this study examined the contribution of multiple measures of ER in hoarding, and explored the role of EA in the alexithymia-hoarding relationship. The findings from the current study are discussed below.

Findings on Emotion Regulation Difficulties and Hoarding

As per the findings from Study 1, the results from the factor analysis in Study 2 revealed that the DERS (Gratz & Roemer, 2004) did not reflect the original six-factor structure. Similar to Study 1, the results suggested that the reverse-scored items of the scale loaded onto one factor, which included the lack of emotional awareness subscale. However, removing the items of this subscale and re-running the factor analysis did not support the lower five-factor structure. Again, it is unclear why the current sample did not replicate either the five- or six-factor structure obtained in other non-clinical samples. Given that a similar pattern of findings was found across two independent non-clinical samples in this research project, our findings are consistent with recent research highlighting the psychometric limitations of the DERS (Bardeen et al., 2016; Bardeen et al., 2012; Cho & Hong, 2013; Lee et al., 2016).

Utilising the modified version of the DERS from Study 1 enabled a comparison of findings across studies. As for Study 1, an overarching measure of emotion dysregulation encompassing difficulties engaging in goal-directed behaviour, non-acceptance of emotional responses, limited access to ER strategies deemed effective, impulse control difficulties, and lack of emotional clarity (Gratz & Roemer, 2004), was positively correlated with hoarding symptoms, demonstrating that greater overall ER difficulties were associated with greater hoarding symptoms. All three hoarding symptom dimensions were positively associated with difficulties in ER, suggesting that greater emotion dysregulation is associated with greater difficulty discarding, higher excessive acquisition, and higher levels of clutter. Furthermore, ER difficulties were
positively associated with higher scores on a measure of hoarding-related beliefs. These results are consistent with the findings from Study 1, although the magnitude of these associations was greater for Study 2. As such, the results from both studies are consistent with, and extend upon, previous research demonstrating associations between the DERS and overall hoarding severity and acquisition behaviours (Raines et al., 2015).

Consistent with the findings from Study 1, the current study found that ER difficulties contributed significant additional variance in total hoarding symptoms, difficulty discarding, and excessive acquisition, after controlling for general depressive and non-hoarding obsessive-compulsive symptoms. Although the total amount of variance explained tended to be higher in the current study and the strongest predictor in the final models may have varied across studies, overall the findings across both studies show that ER difficulties contributed small but significant additional variance in these symptoms after controlling for relevant covariates. In contrast to Study 1, ER difficulties were also found to be significantly associated with excessive clutter over- and-above general depressive and non-hoarding obsessive-compulsive symptoms in the current study. As Study 2 had a smaller sample and the characteristics of the participants were similar across studies, perhaps this difference may be accounted for by mean differences across studies on the clinical measures. For example, the current sample had a slightly higher mean and range on clutter symptoms, ER difficulties, depression, and non-hoarding obsessive-compulsive symptoms. Furthermore, the percentage of participants scoring above the clinical cut-off score for clutter was higher for the current study (9%) than Study 1 (3.5%) and the clutter model in the current study had a much higher total variance (28%) compared to Study 1 (6%).

Theoretically, ER difficulties may be implicated in clutter symptoms given that clutter is negatively reinforced through the avoidance of the negative emotions and distress associated with organising and discarding (Frost & Hartl, 1996; Frost & Steketee, 1998, 2008; Steketee & Frost, 2003, 2014b) and therefore, appears to be a behavioural manifestation of difficulties with tolerating and regulating negative emotions. However, given the inconsistent findings between our two studies with regard to the relationship between clutter and emotion dysregulation, and other research suggesting that clutter is not associated with aspects of emotional avoidance, intolerance, and reactivity after controlling for covariates (Ayers et al., 2014; A. M.
Shaw, Timpano, et al., 2015; Timpano, Shaw, et al., 2014), further research is recommended to clarify this relationship.

Consistent with the findings of Study 1, emotional attachment beliefs were found to mediate the ER-hoarding relationship. While Study 1 found support for partial mediation, the current study found that the relationship between ER difficulties and hoarding was fully accounted for by distorted beliefs about the need for possessions. As noted previously, these findings may indicate that hoarding behaviours result from maladaptive beliefs that have developed from underlying ER deficits. That is, perhaps in the presence of emotion dysregulation, individuals with a tendency toward hoarding turn to the comfort and safety provided by their possessions as a way of regulating negative emotions (or inducing positive emotions), which over time cultivates the formation of stronger emotional attachment to possessions, and the development of beliefs that possessions are needed for emotional stability (Phung et al., 2015). In turn, these distorted cognitions and strong attachments lead to pathological hoarding behaviours (i.e., excessive acquiring, clutter, and difficulty discarding). The current results are consistent with recent research demonstrating that emotional attachment beliefs mediate the ER-hoarding relationship (Phung et al., 2015), and highlight the importance of investigating transdiagnostic factors in the context of disorder-specific features. Indeed, the current study emphasises the prominent role of cognitions in the CBT model of HD, as emotional attachment beliefs were found to fully account for the relationship between ER difficulties and hoarding symptoms. Similarly, using the total score of the SCI as the mediator indicated that overall saving beliefs fully mediated the ER-hoarding relationship.

Findings on Facets of Urgency and Hoarding

With regard to emotion-based impulsivity, a similar pattern of results was found across Study 1 and 2 on the relationships between hoarding-related phenomena and negative and positive urgency. That is, both negative and positive urgency were positively associated with hoarding symptoms, all three hoarding symptom dimensions, and hoarding beliefs. Again, these associations were of stronger magnitude in the current study. Examining the two urgency facets concurrently in the current study demonstrated that after controlling for depressive and non-hoarding obsessive-compulsive symptoms, negative and positive urgency contributed significant additional variance to total hoarding symptoms, and all three symptom dimensions. However, only
negative urgency and non-hoarding obsessive-compulsive symptoms were found to be unique significant predictors of total hoarding symptoms, difficulty discarding, and excessive acquisition. These findings are consistent with those reported for Study 1. The main difference across studies was that the model for clutter was significant in the current study and not in Study 1. Again, this difference may be accounted for by the higher mean, range, and percentage of participants above the clinical cut-off score for clutter in the current sample. However, neither urgency facet was found to make a unique significant contribution to clutter in the final model. It should be noted that examining the independent role of negative and positive urgency in the prediction of hoarding symptoms also largely replicated the findings from Study 1, although positive urgency was found to be a unique significant predictor of clutter after controlling for covariates in the current study. In sum, across two independent non-clinical studies, the findings on negative and positive urgency were largely replicated, highlighting that emotion-based facets of impulsivity contribute to hoarding symptoms. The results across these two studies suggest that of the two urgency facets, negative urgency plays a more prominent role in the prediction of hoarding symptoms. However, given the conceptual and statistical overlap of the two urgency facets, and the inconsistent finding with regard to clutter across our two studies, further research on the concurrent contribution of negative and positive urgency in relation to hoarding is recommended with larger samples.

The use of additional ER constructs in the current study allowed for further exploration of facets of ER in relation to hoarding symptoms. These findings are discussed in detail below.

**Findings on Emotion Regulation Strategies and Hoarding**

In contrast to expectations, the ER strategies of cognitive reappraisal and expressive suppression were not significantly associated with hoarding, with the exception of a weak correlation between expressive suppression and hoarding beliefs. This finding suggests that the tendency to use expressive suppression as an ER strategy is associated with stronger beliefs about the need to save possessions however, given that this association was of weak magnitude, this interpretation is tentative. It is surprising that the use of expressive suppression was not associated with hoarding symptoms, given that individuals with HD may attempt to conceal their hoarding behaviour and the level of clutter in the home, and to mask or minimise the emotional
impact of their symptoms. Furthermore, given that HD is highly comorbid with MDD, and research shows that individuals with MDD use expressive suppression to a greater extent and cognitive reappraisal to a lesser extent than never-disordered individuals (D'Avanzato et al., 2013), it is somewhat surprising that the use of these two ER strategies were not significantly associated with hoarding symptoms in the current study. However, according to Gratz and Roemer (2004), the subjective appraisal of one’s ability to regulate emotional distress may be more relevant to symptoms than the use of specific ER strategies. Indeed, the current findings suggest that self-reported ER difficulties were more relevant to hoarding symptoms than the use of these two ER strategies.

**Findings on Experiential Avoidance and Hoarding**

The current study confirmed the hypotheses with regard to the relationship between EA and hoarding, as greater efforts to avoid internal experiences was significantly associated with greater hoarding symptoms. All three symptom dimensions of hoarding were positively associated with EA, suggesting that greater EA is associated with greater difficulty discarding, higher excessive acquisition, and higher levels of clutter. Higher levels of EA were also associated with greater beliefs about saving possessions, and greater beliefs about emotional attachment to possessions.

Furthermore, EA was found to contribute small, but significant variance in the prediction of total hoarding symptoms, and all three symptom dimensions, after controlling for general depressive and non-hoarding obsessive-compulsive symptoms. These findings are consistent with previous research demonstrating that EA is correlated with SI-R total scores and all three symptom dimensions in non-clinical (Wheaton et al., 2011), and clinical (Ayers et al., 2014) samples. Furthermore, our results are largely consistent with the findings of Wheaton et al. (2011) who found that EA significantly predicted symptoms of acquisition and clutter after controlling for relevant covariates in a non-clinical sample, and the findings of Ayers et al. (2014) who found that EA accounted for significant additional variance in difficulty discarding and acquisition after controlling for symptoms of anxiety and depression in a HD sample. However, in the current study, EA accounted for significant additional variance in all three hoarding symptom dimensions.

As such, these findings are consistent with the CBT conceptualisation of acquisition and difficulty discarding as avoidance-based behaviours that serve to
alleviate negative internal experiences elicited by distorted cognitions about possessions (Frost & Hartl, 1996; Steketee & Frost, 2003, 2014b). Indeed, individuals with HD may engage in EA through their acquiring and saving behaviour (Ayers et al., 2014). Acquiring may serve an EA function in that the behaviour enables the individual with HD to avoid the negative emotions associated with the prospect of not acquiring, while saving behaviour enables the individual with HD to avoid the internal distress associated with discarding (Frost & Hartl, 1996; Steketee & Frost, 2003, 2014b). Furthermore, while previous research suggests that clutter is uniquely predicted by behavioural avoidance (Ayers et al., 2014), the findings of the current study suggest that EA is also implicated in clutter. Indeed, given that individuals with HD typically experience feelings of anxiety and/or distress and feel overwhelmed when sorting, categorising, and discarding, they may be unwilling to endure such internal experiences and make deliberate attempts to control or escape from such experiences, which will then have consequences for the level of clutter in the home. While the findings of the current study are consistent with some of the previous research demonstrating an association between EA and hoarding (Ayers et al., 2014; Wheaton et al., 2011), the results are inconsistent with other research which has found no significant relationship between hoarding and EA in clinical hoarding groups (Fernández de la Cruz et al., 2013; Wheaton et al., 2013). Some of these discrepancies may, in part, be due to the use of different versions of the AAQ-II and differences in sample characteristics. For example, Fernández de la Cruz et al. (2013) and Wheaton et al. (2011) utilised the 10-item version of the AAQ-II in relatively small clinical samples, while the current study was of larger size, non-clinical in nature, and utilised the 7-item version of the AAQ-II, which has demonstrated superior psychometric properties (Bond et al., 2011). While the current study lends support to previous research showing that EA is implicated in hoarding behaviour, given that there are some inconsistencies in the literature, further investigation on the role of EA in hoarding is required in larger clinical samples.

Findings on Alexithymia and Hoarding

As predicted, the current study established the relationship between alexithymia and hoarding. Alexithymia, as measured by the TAS-20 total (Bagby, Parker, et al., 1994) was positively associated with overall hoarding symptoms and all three hoarding symptom dimensions. More specifically, greater difficulties identifying and describing feelings were associated with greater overall hoarding symptoms, higher levels of
acquisition, greater difficulty discarding, and high levels of clutter. Greater difficulties identifying and describing feelings were also associated with greater beliefs about saving possessions, and greater emotional attachment beliefs. This study represents the first investigation of alexithymia in relation to hoarding symptoms as assessed by hoarding-specific measures. However, the results are in line with other relevant research that has reported a significant relationship between compulsive buying and difficulty identifying feelings (Rose & Segrist, 2012), and significant associations between all three facets of alexithymia and the hoarding subscale of an OCD measure (Pozza et al., 2015). In contrast, Grisham et al. (2008) found that saving cognitions were not significantly correlated with a measure of emotional intelligence that is inversely associated with the TAS-20 (Bagby, Parker, et al., 1994). Furthermore, these authors found that individuals with hoarding problems did not significantly differ from non-hoarding anxious or depressed participants, or non-clinical community participants on this measure. However, the construct utilised in the study by Grisham et al. is a one-dimensional measure of emotional intelligence assessing several aspects, such as the appraisal and expression of emotion (in self and others), the regulation of emotion (in self and others), and the utilisation of emotions in solving problems. Furthermore, only a few items on the scale pertain to the ability to identify and describe emotions in self (Schutte et al., 1998). In contrast, the use of a multifaceted construct of alexithymia in the current study enabled a more fine-grained assessment of difficulties with identifying and describing emotions in relation to hoarding.

In examining the specific facets of alexithymia, difficulties identifying and describing feelings were found to contribute small but incremental variance in the prediction of overall hoarding symptoms, and symptoms of difficulty discarding and clutter, after controlling for general depressive and non-hoarding obsessive-compulsive symptoms. In each model, the difficulty identifying feelings facet was found to be a unique predictor, suggesting that this aspect of alexithymia may be the most relevant to hoarding. However, neither facet contributed significant variance to the prediction of acquisition after controlling for covariates. This is somewhat surprising, given previous research demonstrating that the difficulty identifying feelings facet of alexithymia significantly predicted compulsive buying after controlling for relevant covariates (Rose & Segrist, 2012). Indeed, when individuals feel badly but are unable to identify what emotion they are feeling, they may feel incapable of managing the confusing aversive
experience and may be less capable of adaptively regulating the distress (Anestis, Fink, Smith, Selby, & Joiner, 2011). As such, individuals may be more prone to engaging in unhealthy strategies that provide a “high” but involve future negative consequences, such as compulsive acquisition (Rose & Segrist, 2012).

The findings of the current study suggest that difficulties identifying feelings are implicated in hoarding, and more specifically with the facets of clutter and difficulty discarding. It is likely that when attempting to organise clutter and discard possessions, individuals with HD experience generalised distress, which they have a diminished capacity to understand and differentiate. As such, difficulty identifying feelings is likely to impact on the efforts individuals make in order to manage their emotional experiences, and may give rise to the use of avoidance-based strategies (such as saving) to modulate the undifferentiated emotional arousal, which will also impact on the level of clutter in the home. Indeed, the current study lends further support to this notion, as EA was found to fully mediate the relationship between difficulty identifying feelings and hoarding. This suggests that although difficulty identifying feelings is strongly associated with hoarding, this relationship is fully mediated by one’s willingness to tolerate aversive internal experiences. That is, difficulties with identifying feelings are likely to make the emotional experience feel overwhelming and confusing, which presumably impacts on one’s willingness to tolerate such negative internal states and one’s deliberate attempts to control or escape from such experiences (i.e., EA), which in turn impacts on hoarding symptoms. This is consistent with recent research demonstrating that the relationship between alexithymia (in particular difficulty identifying feelings) and symptomatology (psychosomatic and depressive symptoms) is fully mediated by EA in clinical and community samples (Panayiotou et al., 2015). Similarly, the findings are aligned with previous research demonstrating that the inability to tolerate distress mediates that association between difficulty identifying feelings and compulsive buying (Rose & Segrist, 2012). Furthermore, as the mediation model was significant when using the TAS-20 total variable, the current study suggests that the alexithymia-hoarding relationship is fully mediated by EA.

In sum, the current study established a relationship between alexithymia (in particular, the difficulty identifying feelings facet) and hoarding in a non-clinical sample, and provided support for the role of EA in the alexithymia-hoarding relationship. While a multifaceted measure of alexithymia was utilised in the current
study, the externally-oriented thinking subscale of the TAS-20 could not be used due to poor reliability. Additionally, while research shows that the TAS-20 is associated with older age (Lane, Sechrest, & Riedel, 1998; Mattila, Salminen, Nummi, & Joukamaa, 2006; Salminen, Saarijärvi, Äärelä, Toikka, & Kauhanen, 1999), due to a non-normal distribution of the age variable and violations of assumptions, age could not be included as a covariate in the current study. As such, future research is recommended to replicate the findings of the current study, and to further explore the relationship between facets of alexithymia and hoarding in consideration of potential correlates to both conditions, such as older age and socioeconomic status.

**Findings on Multiple Constructs of Emotion Regulation and Hoarding**

Another novel contribution of the current study was the simultaneous examination of multiple ER constructs in the prediction of hoarding symptoms. As noted in Chapter 3, the ER literature suggests that the aspects of ER included in the current project are related, although not completely overlapping, constructs. Theoretically, the emotional clarity subscale of the DERS (Gratz & Roemer, 2004) shares conceptual overlap with the difficulty identifying feelings facet of the TAS-20 (Bagby, Parker, et al., 1994), while EA shares conceptual overlap with the non-acceptance of emotional responses of the DERS, and negative and positive urgency are highly related to one other and share conceptual similarity with the impulse control difficulties subscale of the DERS. Indeed, there were high intercorrelations found between the ER variables in the current study. However, even when considering these multiple facets of ER concurrently in the prediction of hoarding symptoms, general emotion dysregulation and difficulties identifying feelings were found to be unique significant predictors, suggesting that these two constructs may be particularly relevant to hoarding. It is acknowledged that once symptoms of depression and non-hoarding obsessive-compulsive symptoms were accounted for, these significant findings disappeared, which is likely due to reduced power. Future research is recommended with larger samples to test the unique contribution of multiple ER constructs to hoarding, particularly given that such constructs share conceptual and statistical overlap. Alternative research could utilise factor analytic approaches and structural equation modelling to explore latent ER variables in the hoarding domain. Given the lack of conceptual clarity around these key constructs noted in the ER literature (see Berking &
Wupperman, 2012; Gross & Jazaieri, 2014; L. J. Robinson & Freeston, 2014), such research may contribute to elucidating and validly assessing the wider ER construct.

**Limitations**

The findings of the current study should be considered in light of several limitations, which mirror those noted for Study 1. Firstly, data from the current sample did not support the theoretical factor structure of the DERS (Gratz & Roemer, 2004) which prevented a fine-grained analysis of specific facets of emotion dysregulation in relation to hoarding symptom dimensions. However, the results are consistent with the findings from Study 1, and previous research highlighting the psychometric limitations of the DERS (Bardeen et al., 2016; Bardeen et al., 2012; Cho & Hong, 2013; Lee et al., 2016). Secondly, while the use of a non-clinical sample is consistent with most studies in this area (e.g., Coles et al., 2003; Medley et al., 2013; Raines et al., 2015; Timpano et al., 2009; Timpano, Rasmussen, et al., 2013; Wheaton et al., 2011), this may limit the generalizability of the results to clinical populations. Further, as noted for Study 1, future research needs to employ alternative methods to address issues around the directionality of associations between variables, measurement issues, and potential confounds.

**Clinical Implications**

Although ER constructs are likely transdiagnostic, the first two studies of the project provide support for the relevance of ER in hoarding, and collectively, may have implications for the treatment of HD. For example, providing an ER skills training adjunct to current CBT models for HD may be beneficial, which could draw upon interventions from existing approaches such as DBT (Linehan, 1993) or ACT (S. C. Hayes et al., 1999). Specifically, strategies aimed at improving the ability to recognise and understand emotions, increasing the willingness and capacity to tolerate difficult emotions, and improving the ability to resist urges, may be beneficial for increasing ER skills and reducing symptoms. A more detailed discussion of the clinical and treatment implications of the current project is provided in the general discussion.

In sum, this study largely replicated the findings of Study 1, demonstrating that ER difficulties and emotion-based facets of impulsivity (in particular, negative urgency) are implicated in hoarding symptoms. Consistent with Study 1, emotional attachment beliefs were found to mediate the ER-hoarding relationship. While the ER strategies of expressive suppression and cognitive reappraisal were not found to be related to
hoarding, the role of EA in the prediction of hoarding was supported in the current study. Furthermore, this study makes a unique contribution to the literature with regard to the relationship between alexithymia and hoarding. In particular, difficulty identifying feelings appears to be most relevant to hoarding, and EA was found to fully mediate this relationship. Finally, this study provides support for the unique contribution of general emotion dysregulation and difficulties with identifying feelings in the prediction of hoarding, when considering multiple facets of ER simultaneously. As the relevance of ER to hoarding was established across two independent non-clinical studies, the third study of the research project utilised an alternative methodology for exploring ER in a clinical sample. The following chapter addresses Study 3, a qualitative investigation of ER in compulsive hoarding.
Chapter 8. Study 3: A Qualitative Investigation of Emotion Regulation in Compulsive Hoarding

To expand upon the findings from Study 1 and 2, the current study was designed as a pilot investigation of ER in a clinical hoarding sample. The aim of the current study was to explore how individuals with clinically significant hoarding symptoms understand, experience, and regulate their emotions, and how aspects of their hoarding behaviour might serve an emotion regulatory function. As such, this study was predominantly qualitative in nature, utilising in-depth interviews to provide a richer understanding of individuals’ experiences. In addition, the quantitative measures from Study 2 were also completed by participants. The clinical sample was predicted to report higher scores on measures of hoarding, psychological distress, obsessive-compulsive symptoms, and all ER measures, compared to a non-clinical age-matched sample from Study 2. The three specific research questions for the qualitative nature of the study were:

1. How do individuals with hoarding difficulties understand and experience their emotions?
2. How do individuals with hoarding difficulties attempt to regulate their emotions?
3. How might ER be implicated in hoarding behaviour?

This chapter commences with an overview of the design of the current study, followed by the epistemological statement and methodology. Subsequently, the quantitative results from the current study are presented. The qualitative findings for each of the three research questions are then described in sequential order, and the chapter concludes with a discussion of the findings of this study.

Study Design

The current study employed a mixed-method approach whereby both qualitative and quantitative data were collected concurrently (Creswell, 2009). The qualitative data were given priority in the research design and analysis, while the quantitative data provided a secondary role in describing the sample and contrasting with a sample of similarly aged non-clinical participants from Study 2. This mixed-method approach also
allowed for comparisons to be made between the two forms of data collection (Creswell, 2009).

The qualitative interviews were guided by the interpretative phenomenological theoretical perspective, conducted via a semi-structured format, and analysed using thematic analysis. Interpretative phenomenological analysis (IPA, J. A. Smith, 1996) was selected as an appropriate theoretical approach given that IPA is concerned with examining how individuals perceive and explain their personal experiences, rather than seeking to make objective statements of truth (J. A. Smith, 1996; J. A. Smith & Osborn, 2008). Furthermore, IPA was considered a suitable approach for this qualitative investigation because it acknowledges the inherent role of the researcher in making sense of the participant’s experience. That is, in order to gain access to a participant’s experience, the researcher inevitably makes interpretations of the participant’s account through their own conceptions (J. A. Smith, 1996). The IPA approach typically collects data via semi-structured interviews, which aim to facilitate open-ended inquiry and depth of discussion. The interview process was dynamic in that the researcher was guided by the research questions and theoretical background, while allowing the interview to be led by the participant at times in order to seek potentially rich data.

This study utilised purposeful sampling, whereby hoarding participants were recruited specifically because they had experienced the phenomenon under investigation (Creswell, 2009). The qualitative data were analysed using thematic analysis, guided by the recommendations of Braun and Clarke (2006) and Creswell (2013). The specific steps of data analysis are outlined below in the method section.

**Epistemological Statement**

Throughout the course of my postgraduate studies I have learned about the phenomenology of hoarding behaviour, seen HD become formally recognised as a discrete diagnostic category, and witnessed a rapid increase in the research literature on ER. This knowledge, along with the findings from Study 1 and 2, will have influenced the development of my interview schedule. Prior to conducting the interviews I had not worked with any individuals with hoarding difficulties, and my understanding of clinical presentations was largely based on my reading of the literature and discussions with my research supervisors. As a clinician, my bias is that behaviour serves a function. I am interested in understanding the meaning clients make of their presenting
problems and facilitating a collaborative exploration of how they have come to be the person they are today. The phenomenological position and interviewing process is therefore aligned with my approach to clinical interviews and case formulation.

It is likely that my clinical knowledge and experience has led me to hold some expectations about what data might emerge. Firstly, based on my reading of the literature and personal experience with a family member who demonstrates aspects of compulsive buying, I anticipated that questions about acquiring behaviour might reveal an emotion regulatory function. Prior to conducting the interviews, I expected that some participants might have difficulty remaining on track with the interview questions, given the research on attentional difficulties in this population and personal communication with my supervisors and other clinicians. However, I was surprised by how difficult it was for some participants to respond to my questions with relevant answers, even despite redirection back to the question. Although ‘lack of insight’ is a potential facet of HD, I assumed a certain level of insight of these participants given that they had self-referred for a hoarding treatment group. While they all had insight into the problematic nature of their behaviour, there was a range of psychological and emotional insight within this sample. Some of these factors necessitated modifying the interview schedule over time, either by providing examples or additional probes to generate thinking and reflection for some participants who appeared to have difficulty; interrupting and redirecting participants when speaking on a tangent; or allowing others with a higher degree of psychological-mindedness more freedom to speak. Although these modifications were made in an effort to obtain relevant data for analysis, it is possible that the type of questioning became more directive over time and may have influenced the type of responses given.

Method

Participants

A purposive sample of 11 participants (9 females and 2 males) participated in this study. This sample size is consistent with IPA standards (Brocki & Wearden, 2006), as IPA is concerned with a detailed examination of individual experience and depth of analysis rather than larger sample size (J. A. Smith, Flowers, & Larkin, 2009). All participants were recruited from a Compulsive Hoarding and Acquiring Group (CHAG)
run by a university psychology clinic (see Moulding, Nedeljkovic, et al., 2016). The group program has treated over 100 individuals, and participants for this study were recruited across several group programs. To be eligible for acceptance to the group program, participants needed to be adults with clinically significant hoarding symptoms of at least moderate intensity that caused them distress. Participants were assessed via a comprehensive clinical assessment conducted by Masters/Doctoral level psychology students under supervision. The proportion of participants above the cut-off score for the SI-R was 82%. Participants were ineligible for group participation if their hoarding problem was secondary to other issues, if they experienced cognitive or psychological difficulties that would impact on their ability to attend and participate (e.g., current psychotic symptoms, suicidal intent, extensive substance use, organic brain disorder, or moderate to severe intellectual disability), or had severe interpersonal difficulties that would interfere with group participation. To be eligible to participate in the current study, additional criteria included being willing and available to complete self-report measures and participate in an electronically recorded in-depth interview, and consent for the researchers to access data from the participants’ CHAG assessments.

The sample ranged in age from 39 to 68 years ($M = 57.73$, $SD = 8.43$). Demographic details of the sample are summarised in Table 18. The majority of the sample was born in Australia, while four participants had migrated to Australia (three before age 10, one at age 25). The majority of the sample was tertiary educated. Consistent with other hoarding samples (Frost, Steketee, et al., 2011; Tolin, Stevens, et al., 2012), most participants ($n = 6$) experienced comorbid depressive psychopathology. In contrast to previous research suggesting that individuals with hoarding difficulties are less likely to marry and more likely to live alone (e.g., Frost & Gross, 1993; H. J. Kim et al., 2001), only two participants in the current sample (18%) had never married, while 46% of the sample were currently married, and 36% had been previously married.
### Table 18

**Study 3 Participant Demographic Information**

<table>
<thead>
<tr>
<th>ID</th>
<th>Age</th>
<th>Nationality</th>
<th>Educational Attainment</th>
<th>Relationship Status</th>
<th>Employment Status</th>
<th>Comorbidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>57</td>
<td>Australia</td>
<td>Graduate diploma</td>
<td>Married</td>
<td>Part-time</td>
<td>MDD - recurrent AD - current AA – current</td>
</tr>
<tr>
<td>2</td>
<td>54</td>
<td>United Kingdom</td>
<td>Tertiary</td>
<td>Married</td>
<td>Part-time</td>
<td>Nil</td>
</tr>
<tr>
<td>3</td>
<td>49</td>
<td>Australia</td>
<td>Undergraduate Degree</td>
<td>Married</td>
<td>Full-time</td>
<td>OCD</td>
</tr>
<tr>
<td>4</td>
<td>63</td>
<td>Africa</td>
<td>Undergraduate Degree</td>
<td>Widowed</td>
<td>Retired</td>
<td>PDwA - lifetime (not current) GAD OCPD MDD (past)</td>
</tr>
<tr>
<td>5</td>
<td>63</td>
<td>Australia</td>
<td>Secondary school</td>
<td>Divorced</td>
<td>Part-time</td>
<td>MDD - recurrent</td>
</tr>
<tr>
<td>6</td>
<td>53</td>
<td>Australia</td>
<td>TAFE qualification</td>
<td>Single</td>
<td>Unemployed</td>
<td>MDD - recurrent Past mood disorder with psychotic features (stable 25 years)</td>
</tr>
<tr>
<td>7</td>
<td>68</td>
<td>Europe</td>
<td>TAFE qualification</td>
<td>Divorced</td>
<td>Retired</td>
<td>MDD (past) Fibromyalgia</td>
</tr>
<tr>
<td>8</td>
<td>64</td>
<td>Australia</td>
<td>Secondary school</td>
<td>Married</td>
<td>Part-time</td>
<td>Nil</td>
</tr>
<tr>
<td>9</td>
<td>62</td>
<td>United Kingdom</td>
<td>Postgraduate diploma</td>
<td>Divorced</td>
<td>Casual</td>
<td>MDD - recurrent PDwA lifetime (not current) GAD OCPD</td>
</tr>
<tr>
<td>10</td>
<td>63</td>
<td>Australia</td>
<td>TAFE qualification</td>
<td>Married</td>
<td>Full-time</td>
<td>AD – current</td>
</tr>
<tr>
<td>11</td>
<td>39</td>
<td>Australia</td>
<td>Undergraduate Degree</td>
<td>Single</td>
<td>Unemployed</td>
<td>MDD – recurrent Fibromyalgia</td>
</tr>
</tbody>
</table>

**Note:** DSM-IV-TR (APA, 2000) criteria. M.I.N.I.=Mini-International Neuropsychiatric Interview; MDD=major depressive disorder; AD=alcohol dependence; AA=alcohol abuse; OCD=obsessive-compulsive disorder; PDwA=panic disorder without agoraphobia; GAD=generalised anxiety disorder; OCPD=obsessive-compulsive personality disorder.
Materials

Participants were provided with a questionnaire pack that included a Participant Information Statement and Consent Form (see Appendix H), and the ER self-report measures from Study 2. As part of the CHAG assessment participants had already completed a battery of self-report and clinician administered symptom measures. Participants provided consent for the researchers to access the information obtained during their CHAG assessment process for several purposes: 1) to reduce the need for participants to complete symptom measures twice; 2) to provide important descriptive information about the sample; and 3) to help establish the severity of difficulties experienced by the participants in the context of their ability to manage their emotions. The primary information obtained from the participants’ CHAG assessments were their results from the DASS-21 (Lovibond & Lovibond, 1995), SI-R (Frost et al., 2004), SCI (Steketee et al., 2003), and Mini-International Neuropsychiatric Interview (M.I.N.I; Sheehan et al., 1998). The M.I.N.I is a short, structured clinical interview which assists clinicians with diagnosing individuals with psychiatric disorders.

A semi-structured qualitative interview was developed in consultation with the supervisory team who offered expert advice in the area of hoarding and qualitative research. The study’s aims and research questions were developed on the basis of the findings from Study 1 and 2, primarily designed as a pilot exploration of the emotional experiences of hoarding participants, their ER efforts and strategies, and how ER might be implicated in hoarding behaviour. Initially, the student researcher generated a pool of potential questions and prompts for the three broad research questions, and then developed an initial interview schedule utilising the most pertinent questions. The initial interview schedule was then revised by the primary supervisor who is a clinical psychologist with clinical and research expertise in the area of compulsive hoarding, and by a researcher with expertise in qualitative research methods (including IPA and thematic analysis). Revisions to the interview schedule included reducing the number of questions, improving the clarity of question phrasing, and restructuring the order of inquiries and prompts. The key areas of questioning for the interview, along with example prompts, are shown in Table 19.
<table>
<thead>
<tr>
<th>Topic Area</th>
<th>Example prompts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emotions experienced</strong></td>
<td>• Can you describe some positive/pleasant emotions that you experience in daily life?</td>
</tr>
<tr>
<td></td>
<td>• What types of things bring about positive emotions for you?</td>
</tr>
<tr>
<td></td>
<td>• Can you describe some negative/unpleasant emotions that you experience in daily life?</td>
</tr>
<tr>
<td></td>
<td>• What types of things bring about negative/unpleasant emotions for you?</td>
</tr>
<tr>
<td></td>
<td>• What does it mean to you to feel upset or distressed?</td>
</tr>
<tr>
<td></td>
<td>• How much control do you have over your urges and behaviour when you are in a negative mood? Positive mood? Can you give examples?</td>
</tr>
<tr>
<td><strong>Ways of managing emotions</strong></td>
<td>• Can you describe to me how you try to manage your negative emotions? (Probe: How does that help?)</td>
</tr>
<tr>
<td></td>
<td>• When you want to feel more positive emotion what do you do? (Probe: How does that help?)</td>
</tr>
<tr>
<td></td>
<td>• How do you obtain emotional comfort or relief?</td>
</tr>
<tr>
<td></td>
<td>• Can you give me a recent example of when you’ve been upset or distressed? What emotions did you feel at the time? How did you manage your emotions?</td>
</tr>
<tr>
<td></td>
<td>• Do you think you have effective/helpful strategies for managing your emotions? Why/why not?</td>
</tr>
<tr>
<td><strong>Hoarding behaviour</strong></td>
<td>• Do you think emotional incidents in the past are related to your hoarding? Please describe.</td>
</tr>
<tr>
<td></td>
<td>• In what ways (if any) is hoarding helpful for managing your emotions?</td>
</tr>
<tr>
<td></td>
<td>• Can you give me an example of a time when you’ve been upset or emotional and some aspect of your hoarding has helped you feel better?</td>
</tr>
<tr>
<td></td>
<td>• In your experience, what purpose do your possessions/belongings serve when you are upset?</td>
</tr>
</tbody>
</table>
Procedure

The study was approved by the university ethics committee (SUHREC Project 2013/036, see Appendix H1). Recruitment involved the researcher attending several CHAG sessions to provide a brief summary of the project and invite people to participate. Interested individuals were contacted by the researcher, at which point they received information about the project and their rights and obligations (see Appendix H2), the self-report questionnaires and an interview time was scheduled. Prior to commencing the interview, consent forms and completed self-report questionnaires were collected and confidentiality was discussed. Participants were informed that they were free to disclose as much or as little personal information as they deemed appropriate, and were reminded that they were free to withdraw from the study and terminate the interview at any time. All interviews were conducted at the university psychology clinic, electronically recorded via audio device, and were approximately 1 – 1.5 hours in duration.

Consistent with the recommendations of Smith, Flowers, and Larkin (2009), the interview schedule was used as a guide rather than a rule. Although the standard questions were focused towards areas of theoretical interest, there was variation in the style and order of the questions and prompts used, tailored for the individual as required. This approach to interviewing allowed for rapport building, empathic listening, tentative summarising, and probing for clarification or exploration. Throughout the process of data collection the interview schedule was modified with supervisory input in consideration of the emerging data (e.g., wording of questions modified, additional prompts or examples given, dropping questions that were not effective, order of questions changed, etc.).

If at any time during the interview a participant became emotional, the researcher ‘checked in’ with the participant, offering support and a break if needed. At the end of the interview, participants were asked if they had any questions or anything else to contribute, and were also given the opportunity to debrief about the interview and any emotions it might have evoked. No participant indicated signs of distress or risk issues at the end of the interview process. The researcher made follow-up phone calls to two participants in the days after interview for further information and debrief.
Qualitative data analysis

Thematic analysis of the qualitative data was conducted in accordance with the recommendations of Braun and Clarke (2006) and Creswell (2013). Initially, each interview was listened to in its entirety and reviewed against its verbatim transcription, with corrections and additions (e.g., tears, laughter, and punctuation) made where necessary. All transcriptions were de-identified. Each transcribed interview was initially engaged with separately through a process of multiple readings in order to get an understanding of the individual’s experience. Important statements were highlighted on each transcription. A detailed summary was then generated for each individual participant, which included their scores on the self-report measures, summarised points of the participant’s responses to the research topic areas, observations from the researcher’s journal notes at time of interview, additional relevant information from the participant’s CHAG assessment, and a section on the researcher’s overall impressions using an individual case formulation framework. Initial coding was conducted manually by reading clean transcripts and making notes in the margins next to each segment of participant text. Statements were coded in terms of patterns of response to the three main research areas, and all relevant segments of interview text were copied into a Microsoft (MS) Word document table. Numerical codes were typed next to each segment of text, which corresponded to meaningful code names in a separate MS Word document. The initial codes were then organised into potential clusters (themes), which represented the patterns of response across the interviews. In a circular process, themes were refined and revised during this process and checked against the transcripts. Cross-evaluation of the thematic analysis was conducted with the supervising qualitative research team. Ongoing consultation with the supervisory team during the writing phrase assisted with the process of defining and re-naming themes, and selecting the most representative quotes for inclusion in the final write-up.

To improve the rigor of the qualitative data analysis process, several validation methods were adopted: regular supervision during the data collection phase to ensure transparency in process; documentation of the analysis procedure (participant summaries and themes were described in detail for transparency); regular supervision during the analysis process to provide ongoing critique and cross-validation of themes; and identification of researcher bias (Creswell, 2013).
Quantitative Results

Overview of Quantitative Data Analyses

Participants’ responses to the pen-and-paper questionnaires were entered into SPSS 21 and data screening and assumption testing was conducted. Means, standard deviations, and ranges for each measure were generated for the total sample. *T*-tests were then used to compare the group means from Study 3 to a sample of similarly aged non-clinical participants from Study 2.

Data Screening and Assumption Testing

Prior to statistical analyses, descriptive statistics and frequency tables were produced and examined for missing values, correct minimum and maximum values, and out of range scores. There were 17 missing values from the dataset (0.9%). No individual had more than 17% missing data from any one subscale. In order to impute missing values via an expectation maximisation (EM) algorithm, the assumption that data is ‘missing completely at random’ (MCAR) must be met. Little’s MCAR test indicated that the data was missing completely at random ($\chi^2 = .000, df = 973, p > .05$) and therefore suitable for EM methods. Missing data was subsequently imputed using the EM technique in SPSS 21.

Following data screening, assumption testing was carried out for *t*-tests. Normality was assessed via inspection of histograms, box plots, and normal probability plots, and noting skewness and kurtosis values above the $\alpha = .001$ significance level of 3.29 (Tabachnick & Fidell, 2013). There were no violations of normality for any of the variables included in the *t*-tests, which is typical of clinical measures when used in clinical samples.

The ER measures were checked for internal consistency, and Cronbach’s alphas are displayed in Table 20. As shown, reliabilities ranged from adequate to excellent, with the exception of the TAS-20 externally-oriented thinking subscale. The low alpha on this subscale is consistent with the results from Study 2 and previous research demonstrating lower reliabilities for this subscale (Bagby, Parker, et al., 1994; Bressi et al., 1996; Parker et al., 2003). As such, this subscale was excluded from statistical analyses due to its low reliability.
Table 20

*Internal Consistencies for Study 3 Measures*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Cronbach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DERS</strong></td>
<td></td>
</tr>
<tr>
<td>Total Minus Awareness</td>
<td>.94</td>
</tr>
<tr>
<td><strong>AAQ-II</strong></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>.88</td>
</tr>
<tr>
<td><strong>TAS-20</strong></td>
<td></td>
</tr>
<tr>
<td>Difficulty Describing Feelings</td>
<td>.92</td>
</tr>
<tr>
<td>Difficulty Identifying Feelings</td>
<td>.84</td>
</tr>
<tr>
<td>Externally-Oriented Thinking</td>
<td>.35</td>
</tr>
<tr>
<td>Total</td>
<td>.89</td>
</tr>
<tr>
<td><strong>ERQ</strong></td>
<td></td>
</tr>
<tr>
<td>Expressive Suppression</td>
<td>.76</td>
</tr>
<tr>
<td>Cognitive Reappraisal</td>
<td>.79</td>
</tr>
<tr>
<td><strong>UPPS-P</strong></td>
<td></td>
</tr>
<tr>
<td>Negative Urgency</td>
<td>.90</td>
</tr>
<tr>
<td>Positive Urgency</td>
<td>.90</td>
</tr>
</tbody>
</table>

*Note: N=11*

DERS=Difficulties in Emotion Regulation Scale; Non-acceptance=Non-Acceptance of Emotional Responses; Goals=Difficulties Engaging in Goal-Directed Behaviour; Impulse Control=Impulse Control Difficulties; Awareness=Lack of Emotional Awareness; Strategies=Limited Access to Emotion Regulation Strategies; Clarity=Lack of Emotional Clarity; Total (MA)=DERS Total Minus Awareness subscale; AAQ-II=Acceptance and Action Questionnaire II; TAS-20=Toronto Alexithymia Scale; ERQ=Emotion Regulation Questionnaire; UPPS-P=UPPS-P Impulsive Behavior Scale.
Descriptive Data

Means and standard deviations, as well as observed and possible ranges for each of the variables in Study 3 are presented in Table 21. The mean score on the SI-R subscales and total scale were above clinical cut-off scores and in the range of average scores for people with HD (Steketee & Frost, 2014b). Likewise, the mean score on the SCI total scale and all subscales were comparable with the average scores for people with HD (Steketee & Frost, 2014b). With regard to the other symptom measures, the mean score on the OCI-R total was below the clinical cut-off score for OCD (Foa et al., 2002), below means observed for OCD samples (e.g., Abramowitz & Deacon, 2006; Foa et al., 2002), and consistent with means observed for hoarding samples (e.g., Landau et al., 2011). Likewise, the mean score for non-hoarding obsessive-compulsive symptoms was comparable with those reported for other hoarding samples (e.g., Frost, Tolin, et al., 2011; Morein-Zamir et al., 2014; Tolin & Villavicencio, 2011). The sample’s mean score on the DASS-21 depression subscale was slightly lower than those found for clinical hoarding samples (e.g., Frost, Tolin, et al., 2011; Przeworski et al., 2014; Tolin, Meunier, et al., 2010), and indicated an overall mean score in the moderate range for depression (Lovibond & Lovibond, 1995).

With regard to the ER measures, the mean score on the DERS scale and subscales were within the range of mean scores reported for HD individuals (Fernández de la Cruz et al., 2013). The mean score for the AAQ-II was slightly above that reported for the same 7-item version in a clinical hoarding sample (Wheaton et al., 2013). While the TAS-20 has not been investigated in a clinical hoarding sample, the mean scores on this scale and subscales were slightly above those reported for OCD outpatients (De Berardis et al., 2005). The mean score for negative urgency was lower than those reported for compulsive buyers (A. D. Williams & Grisham, 2012) and participants classified as high in hoarding (Phung et al., 2015), but above the mean scores reported for an unselected sample (Timpano, Rasmussen, et al., 2013). While there is no published research on positive urgency in hoarding samples, the current sample’s mean score on this measure was lower than those reported by compulsive buyers and healthy controls (A. D. Williams & Grisham, 2012). The current sample’s mean for expressive suppression was below those reported for pathological gamblers and clinical controls, while the mean score for cognitive reappraisal in the current sample was above those reported for these groups (A. D. Williams et al., 2012).
Table 21

Study 3 Means, Standard Deviations, and Scale Ranges

<table>
<thead>
<tr>
<th>Study 3 Means, Standard Deviations, and Scale Ranges</th>
<th>M</th>
<th>SD</th>
<th>Observed Range</th>
<th>Possible Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hoarding Symptoms and Beliefs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SI-R Total</td>
<td>59.73</td>
<td>18.33</td>
<td>29-88</td>
<td>0-92</td>
</tr>
<tr>
<td>SI-R Clutter</td>
<td>24.27</td>
<td>6.71</td>
<td>16-35</td>
<td>0-36</td>
</tr>
<tr>
<td>SI-R Acquisition</td>
<td>16.82</td>
<td>6.57</td>
<td>4-28</td>
<td>0-28</td>
</tr>
<tr>
<td>SI-R Discarding</td>
<td>18.64</td>
<td>6.59</td>
<td>5-28</td>
<td>0-28</td>
</tr>
<tr>
<td>SCI Total</td>
<td>89.55</td>
<td>33.85</td>
<td>37-165</td>
<td>24-168</td>
</tr>
<tr>
<td>SCI Emotional Attachment</td>
<td>34.45</td>
<td>14.35</td>
<td>19-70</td>
<td>10-70</td>
</tr>
<tr>
<td>SCI Control</td>
<td>12.91</td>
<td>5.65</td>
<td>4-21</td>
<td>3-21</td>
</tr>
<tr>
<td>SCI Responsibility</td>
<td>24.73</td>
<td>9.51</td>
<td>6-41</td>
<td>6-42</td>
</tr>
<tr>
<td>SCI Memory</td>
<td>17.45</td>
<td>8.99</td>
<td>5-33</td>
<td>5-35</td>
</tr>
<tr>
<td><strong>Psychological Distress</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DASS-21 Depression</td>
<td>15.91</td>
<td>12.00</td>
<td>6-42</td>
<td>0-42</td>
</tr>
<tr>
<td><strong>O-C Symptoms</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCI-R Total</td>
<td>19.36</td>
<td>11.06</td>
<td>0-40</td>
<td>0-72</td>
</tr>
<tr>
<td>OCIR-NH</td>
<td>11.36</td>
<td>9.69</td>
<td>0-30</td>
<td>0-60</td>
</tr>
<tr>
<td><strong>Emotion Regulation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DERS Total</td>
<td>90.00</td>
<td>19.25</td>
<td>64-130</td>
<td>36-180</td>
</tr>
<tr>
<td>DERS Total (MA)</td>
<td>71.91</td>
<td>20.68</td>
<td>49-117</td>
<td>30-150</td>
</tr>
<tr>
<td>DERS Non-Acceptance</td>
<td>13.36</td>
<td>6.50</td>
<td>7-27</td>
<td>6-30</td>
</tr>
<tr>
<td>DERS Goals</td>
<td>16.45</td>
<td>4.74</td>
<td>9-24</td>
<td>5-25</td>
</tr>
<tr>
<td>DERS Impulse</td>
<td>11.91</td>
<td>3.89</td>
<td>7-19</td>
<td>6-30</td>
</tr>
<tr>
<td>DERS Awareness</td>
<td>18.09</td>
<td>3.83</td>
<td>13-25</td>
<td>6-30</td>
</tr>
<tr>
<td>DERS Strategies</td>
<td>18.18</td>
<td>5.81</td>
<td>12-32</td>
<td>8-40</td>
</tr>
<tr>
<td>DERS Clarity</td>
<td>12.00</td>
<td>3.95</td>
<td>5-19</td>
<td>5-25</td>
</tr>
<tr>
<td>AAQ-II</td>
<td>26.00</td>
<td>8.60</td>
<td>16-40</td>
<td>7-49</td>
</tr>
<tr>
<td>TAS-20 Total</td>
<td>55.73</td>
<td>11.43</td>
<td>37-78</td>
<td>20-100</td>
</tr>
<tr>
<td>TAS-20 DDF</td>
<td>15.09</td>
<td>4.85</td>
<td>5-23</td>
<td>5-25</td>
</tr>
<tr>
<td>TAS-20 DIF</td>
<td>20.18</td>
<td>4.88</td>
<td>11-28</td>
<td>7-35</td>
</tr>
<tr>
<td>ERQ Suppression</td>
<td>14.91</td>
<td>4.70</td>
<td>6-22</td>
<td>4-28</td>
</tr>
<tr>
<td>ERQ Reappraisal</td>
<td>28.45</td>
<td>6.41</td>
<td>15-36</td>
<td>6-42</td>
</tr>
<tr>
<td>UPPS-P NegUrg</td>
<td>2.41</td>
<td>0.60</td>
<td>1.50-3.33</td>
<td>1-4</td>
</tr>
<tr>
<td>UPPS-P PosUrg</td>
<td>1.79</td>
<td>0.51</td>
<td>1.21-2.86</td>
<td>1-4</td>
</tr>
</tbody>
</table>

*Note: SI-R=Savings Inventory Revised; Clutter=Excessive Clutter; Acquisition=Excessive Acquisition; Discarding=Difficulty Discarding; SCI=Saving Cognitions Inventory; DASS-21=Depression, Anxiety, and Stress Scales; O-C Symptoms=Obsessive Compulsive Symptoms; OCI-R=Obsessive Compulsive Inventory Revised; OCIR-NH=Obsessive Compulsive Inventory Revised Non-Hoarding variable; DERS=Difficulties in Emotion Regulation Scale; DERS Total (MA)=DERS Total minus Awareness subscale; Non-acceptance=Non-Acceptance of Emotional Responses; Goals=Difficulties Engaging in Goal-Directed Behaviour; Impulse=Impulse Control Difficulties; Awareness=Lack of Emotional Awareness; Strategies=Limited Access to Emotion Regulation Strategies; Clarity=Lack of Emotional Clarity; AAQ-II=Acceptance and Action Questionnaire II; TAS-20=Toronto Alexithymia Scale; DDF=Difficulty Describing Feelings; DIF=Difficulty Identifying Feelings; UPPS-P=UPPS-P Impulsive Behavior Scale; NegUrg=Negative Urgency; PosUrg=Positive Urgency.*
**T-Tests**

A series of independent *t*-tests were performed to compare clinical participants from Study 3 with a sample of similarly aged non-clinical participants from Study 2 on measures of hoarding symptoms and beliefs, psychological distress, and ER. As there were not enough non-clinical participants that matched the exact ages of the qualitative participants (*n* = 11), a sample of the oldest individuals from Study 2 (*n* = 14) was selected to represent a similar age range for comparison. As shown in Table 22, a *t*-test demonstrated that the mean age of the two samples were not significantly different, *t*(23) = 1.88, *p* = .072. The assumption of homogeneity of variance was met for the majority of *t*-tests, however for some of the clinical measures the data violated this assumption, in which case the alternative *t*-value was reported where equal variances were not assumed.

The results of the *t*-tests for all measures are displayed in Table 22, with significant differences indicated in bold. As shown, Study 3 participants scored significantly higher than similarly aged non-clinical participants on all of the hoarding measures, with the exception of the control over possessions subscale of the SCI. Likewise, Study 3 participants scored significantly higher than the non-clinical sample on DASS-21 depression and OCI-R total. With regard to the ER measures, Study 3 participants scored significantly higher than non-clinical participants on measures of EA (i.e., AAQ-II) and alexithymia (i.e., TAS-20 total scale and difficulty identifying feelings subscale). However, the two groups were not significantly different from each other with respect to overall ER difficulties (i.e., DERS), the use of cognitive reappraisal and expressive suppression strategies (i.e., ERQ), or negative and positive urgency (i.e., UPPS-P). Effect sizes for all group comparisons, along with 95% confidence intervals are also displayed in Table 22. As shown, all significant findings, as indicated in bold, were of large effect size.
### Table 22

**Comparisons between Study 2 and 3 Group Means on All Measures**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Study 3 ($n=11$)</th>
<th>Study 2 ($n=14$)</th>
<th>Comparison</th>
<th>Cohen’s $d$</th>
<th>95% Confidence Interval for Cohen’s $d$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>$M = 57.73$</td>
<td>$SD = 8.43$</td>
<td>$M = 52.36$</td>
<td>$SD = 5.83$</td>
<td>$t(23) = 1.88, p = .072$</td>
</tr>
<tr>
<td>Hoarding Measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SI-R Total</td>
<td>$59.73$</td>
<td>$18.33$</td>
<td>$13.93$</td>
<td>$8.74$</td>
<td>$t(13.56) = 7.63, p = .000$</td>
</tr>
<tr>
<td>SI-R Clutter</td>
<td>$24.27$</td>
<td>$6.71$</td>
<td>$3.93$</td>
<td>$4.25$</td>
<td>$t(16.07) = 8.77, p = .000$</td>
</tr>
<tr>
<td>SI-R Acquisition</td>
<td>$16.82$</td>
<td>$6.57$</td>
<td>$4.07$</td>
<td>$2.95$</td>
<td>$t(23) = 6.50, p = .000$</td>
</tr>
<tr>
<td>SI-R Discarding</td>
<td>$18.64$</td>
<td>$6.59$</td>
<td>$5.93$</td>
<td>$3.50$</td>
<td>$t(23) = 6.21, p = .000$</td>
</tr>
<tr>
<td>SCI Total</td>
<td>$89.55$</td>
<td>$33.85$</td>
<td>$43.79$</td>
<td>$18.48$</td>
<td>$t(23) = 4.32, p = .000$</td>
</tr>
<tr>
<td>SCI EA</td>
<td>$34.45$</td>
<td>$14.35$</td>
<td>$16.64$</td>
<td>$9.00$</td>
<td>$t(23) = 3.80, p = .001$</td>
</tr>
<tr>
<td>SCI Cont</td>
<td>$12.91$</td>
<td>$5.65$</td>
<td>$9.07$</td>
<td>$4.48$</td>
<td>$t(23) = 1.90, p = .070$</td>
</tr>
<tr>
<td>SCI Resp</td>
<td>$24.73$</td>
<td>$9.51$</td>
<td>$9.50$</td>
<td>$3.96$</td>
<td>$t(12.72) = 4.98, p = .000$</td>
</tr>
<tr>
<td>SCI Mem</td>
<td>$17.45$</td>
<td>$8.99$</td>
<td>$8.57$</td>
<td>$4.91$</td>
<td>$t(14.62) = 2.95, p = .010$</td>
</tr>
<tr>
<td>Psychological Distress</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DASS-21 Dep</td>
<td>$15.91$</td>
<td>$12.00$</td>
<td>$6.14$</td>
<td>$5.29$</td>
<td>$t(13.05) = 2.51, p = .026$</td>
</tr>
<tr>
<td>O-C Symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCI-R Total</td>
<td>$19.36$</td>
<td>$11.06$</td>
<td>$6.21$</td>
<td>$5.45$</td>
<td>$t(13.80) = 3.61, p = .003$</td>
</tr>
<tr>
<td>OCIR-NH</td>
<td>$11.36$</td>
<td>$9.69$</td>
<td>$4.79$</td>
<td>$4.42$</td>
<td>$t(13.27) = 2.09, p = .057$</td>
</tr>
<tr>
<td>Scale</td>
<td>Mean</td>
<td>SD</td>
<td>T Value</td>
<td>p Value</td>
<td>Effect Size</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------</td>
<td>-----</td>
<td>---------</td>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>DERS Tot (MA)</td>
<td>71.91</td>
<td>20.68</td>
<td>20.11</td>
<td>t(23) = 1.70, p = .102</td>
<td>0.69</td>
</tr>
<tr>
<td>AAQ-II</td>
<td>26.00</td>
<td>8.60</td>
<td>16.86</td>
<td>t(23) = 2.61, p = .016</td>
<td>1.05</td>
</tr>
<tr>
<td>TAS-20 Total</td>
<td>55.73</td>
<td>11.43</td>
<td>43.71</td>
<td>t(23) = 2.66, p = .014</td>
<td>1.07</td>
</tr>
<tr>
<td>TAS-20 DDF</td>
<td>15.09</td>
<td>4.85</td>
<td>11.64</td>
<td>t(23) = 2.02, p = .056</td>
<td>0.81</td>
</tr>
<tr>
<td>TAS-20 DIF</td>
<td>20.18</td>
<td>4.88</td>
<td>14.00</td>
<td>t(23) = 2.81, p = .010</td>
<td>1.13</td>
</tr>
<tr>
<td>ERQ Supp</td>
<td>14.91</td>
<td>4.70</td>
<td>15.71</td>
<td>t(23) = -4.04, p = .690</td>
<td>-0.16</td>
</tr>
<tr>
<td>ERQ Reapp</td>
<td>28.45</td>
<td>6.41</td>
<td>25.79</td>
<td>t(23) = .98, p = .336</td>
<td>0.40</td>
</tr>
<tr>
<td>UPPS-P NegUrg</td>
<td>2.41</td>
<td>0.60</td>
<td>2.28</td>
<td>t(23) = .46, p = .650</td>
<td>0.19</td>
</tr>
<tr>
<td>UPPS-P PosUrg</td>
<td>1.79</td>
<td>0.51</td>
<td>1.70</td>
<td>t(23) = .32, p = .756</td>
<td>0.13</td>
</tr>
</tbody>
</table>

Note: SI-R=Savings Inventory Revised; Clutter=Excessive Clutter; Acquisition=Excessive Acquisition; Discarding=Difficulty Discarding; SCI=Saving Cognitions Inventory; EA=Emotional Attachment to Possessions; Cont=Control over Possessions; Resp=Responsibility for Possessions; Mem=Memory for Possessions; DASS-21=Depression, Anxiety, and Stress Scales; Dep=Depression; O-C Symptoms=Obsessive Compulsive Symptoms; OCI-R=Obsessive Compulsive Inventory Revised; OCIR-NH=Obsessive Compulsive Inventory Revised Non-Hoarding variable; DERS Tot (MA)=Difficulties in Emotion Regulation Scale Total Minus Awareness subscale; AAQ-II=Acceptance and Action Questionnaire II; TAS-20=Toronto Alexithymia Scale; DDF=Difficulty Describing Feelings; DIF=Difficulty Identifying Feelings; ERQ=Emotion Regulation Questionnaire; Supp=Expressive Suppression; Reapp=Cognitive Reappraisal; UPPS-P=UPPS-P Impulsive Behavior Scale; NegUrg=Negative Urgency; PosUrg=Positive Urgency.
Qualitative Results

Each of the three broad research questions for the qualitative part of the study will be considered in turn, with the aim of describing the themes that were drawn from the participants’ interview transcripts. At the end of each research question, a figure illustrating the main themes for that research question area will be presented. The qualitative results section concludes with an overview of some of the observations and challenges encountered during the interview process.

Q1: How do individuals with hoarding difficulties understand and experience their emotions?

This broad research question was addressed through a series of questions about the typical emotions experienced by participants, sources of positive and negative emotions, and attitudes about the emotional experience. The following section will describe the pattern of responses drawn from participants’ narratives in relation to these questions.

Emotions Experienced

Participants were asked about the emotions they tend to experience, and probing for emotional descriptions was also conducted throughout the interview process. A list of the positive and negative emotions spontaneously labelled by participants across the duration of their interviews is displayed in Table 23, along with the number of participants that identified each emotion. The most common positive emotion labelled was ‘happiness’, while the most common negative emotions were ‘anger’, ‘sadness’, ‘anxiety’, ‘depression’, and ‘stress’. Through asking participants about the emotions they experience, a theme of ‘difficulties in naming emotions’ emerged for a subset of the sample.

Difficulties in naming emotions.

There was a range of ability for labelling emotions across the sample. For example, one participant reported that she had studied emotional intelligence in the past, and was indeed able to articulate the broadest range of emotional terms, while others had more difficulty with naming emotions. Overall, participants appeared to have a
more restricted range of vocabulary for positive emotions as compared to negative emotions. Several participants \( (n = 3; 27\%) \) specifically noted difficulty describing positive emotions:

*Wow it’s interesting - I think because I’ve had depression and fibromyalgia for quite a long time, so it’s interesting talking about positive feelings. I don’t really, yeah it’s hard to - wow yeah that’s hard… I can think of a lot of negative ones but not so many positive ones. Wow, that’s interesting (P11)*

*I don’t know, it’s sort of funny - I don’t have any language for feelings and emotions, but I’m contrasting it with what I feel a lot of the time - and that is not relaxed, and anxious. So it’s the absence of those feelings… (P9)*

*It’s hard… do you have any suggestions? (P8)*

Although all participants could name at least a few emotions and describe some of the emotions associated with their hoarding behaviour, across the interviews there was a range of ability to speak at an emotional level. Observationally, there appeared to be a subset of participants \( (n = 5; 45\%) \) who had some difficulty identifying and talking about their emotional experiences. Participants in this group tended to respond to questions about emotions with answers about their cognitions or behaviour, sometimes requiring multiple probes to access emotional content. Often they provided one word generalised labels such as ‘good’, and did not provide much emotional depth. Furthermore, they appeared to be more concrete in their thinking, less likely to reflect on the emotional bases of their behaviour, and more likely to attribute external reasons for behaviour. This subset of participants demonstrated evidence of alexithymia and lack of emotional awareness throughout their interviews. Given that these facets of emotion dysregulation inherently pertain to difficulty in the areas of recognising and communicating emotions, there are limited direct quotes available from the transcripts to illustrate these concepts.
Table 23

*Emotions Labelled by Participants in Study 3*

<table>
<thead>
<tr>
<th>Positive Emotions</th>
<th>Negative Emotions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Happiness/Happy</td>
<td>Anger/angry</td>
</tr>
<tr>
<td>High/thrill/buzz</td>
<td>Sadness</td>
</tr>
<tr>
<td>Content/contentment</td>
<td>Anxiety/anxious</td>
</tr>
<tr>
<td>Pleasure</td>
<td>Depressed/depression</td>
</tr>
<tr>
<td>Excitement/excited</td>
<td>Stress/stressed</td>
</tr>
<tr>
<td>Sense of achievement/accomplishment</td>
<td>Shame/Ashamed</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>Frustration</td>
</tr>
<tr>
<td>Besotted</td>
<td>Guilt</td>
</tr>
<tr>
<td>Anticipation</td>
<td>Overwhelmed</td>
</tr>
<tr>
<td>Motivated</td>
<td>Loss</td>
</tr>
<tr>
<td>At peace</td>
<td>Lonely/loneliness</td>
</tr>
<tr>
<td>Comfortable</td>
<td>Upset</td>
</tr>
<tr>
<td>Elated</td>
<td>Frightened/fear</td>
</tr>
<tr>
<td>Glad</td>
<td>Blank/numb</td>
</tr>
<tr>
<td>Relaxed</td>
<td>Devastated</td>
</tr>
<tr>
<td>Lightness</td>
<td>Irritated/agitated</td>
</tr>
<tr>
<td>Optimism</td>
<td>Unhappiness</td>
</tr>
<tr>
<td>Euphoria</td>
<td>Impatience</td>
</tr>
<tr>
<td>Sense of belonging</td>
<td>Desperation</td>
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<tr>
<td>Enthusiastic</td>
<td>Disappointment/disappointed</td>
</tr>
<tr>
<td>Fulfilment</td>
<td>Grief</td>
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<tr>
<td>Freedom</td>
<td>Sorrow</td>
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<tr>
<td></td>
<td>Exhaustion</td>
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<tr>
<td></td>
<td>Betrayed</td>
</tr>
<tr>
<td></td>
<td>Embarrassed/embarrassment</td>
</tr>
<tr>
<td></td>
<td>Panicky</td>
</tr>
<tr>
<td></td>
<td>Persecution</td>
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Sources of Positive Emotions

Participants identified several experiences that elicit positive emotions for them, which clustered into three main areas: (1) Interpersonal Relationships, (2) Interests/hobbies, and (3) Hoarding. Most participants ($n = 6; 55\%$) identified spending time with others as a source of positive emotions for them, and across the narratives this referred to spending time with friends, children, and/or grandchildren. For example, Participant 3 stated, “My kids make me happy. So I feel very content when I'm with my children”. Interests and hobbies were also identified by all participants as a source of positive emotions, and covered a range of activities such as gardening, travelling/holidays, pets/animals, television/internet, and music and creative pursuits. For example, Participant 4 stated “I like doing things like travelling, dining out, going for holidays at the beach, I like surfing the internet”, and Participant 6 identified her scrapbooking as a source of positive emotions for her, stating “Scrapbooking gives me a sense of achievement and creativity, mixing with groups and socialising, a hobby... it’s fun for me”.

All participants were able to identify some aspect of their hoarding behaviour as a source of positive emotions. As these descriptions revealed aspects of hoarding behaviour as serving an emotional function for eliciting positive emotions, these descriptions are addressed under research question 3.

Sources of Negative Emotions

Participants identified experiences such as work difficulties ($n = 4; 36\%$), physical pain ($n = 3; 27\%$), significant deaths ($n = 5; 45\%$), and loss of relationships ($n = 4; 36\%$) as sources of negative emotions for them. Across the participants’ narratives, descriptions about sources of negative emotions clustered into three main themes: (1) Interpersonal relationships, (2) Hoarding, and (3) Self-view.

1. Interpersonal relationships.

Most participants ($n = 9; 82\%$) identified current interpersonal relationships as a main source of negative emotions for them. Several participants ($n = 4; 36\%$) spoke specifically about their marital relationships as a source of negative emotions. For example:
I think it's more frustration, definitely a lot of frustration - he knows the buttons to press, and I just still keep letting him press them. Sadness, no, it's more frustration and anger I think. They're probably the two that I feel the most with him, and he's probably the worst one out of all of the people I can think of. Because you know the public come and go, so you know, they're out of your face, and that's fine. But it's people that you live with that can really push you (P3)

I get anxious I suppose about my relationship with my husband, and I feel that if I haven't accomplished - he's quite judgmental if things aren't done. If I've been home all day and I've, I don't know, watched television or you know been unable to produce tea and things like that, or if I go out and I come back late, I get quite anxious about his response to that (P1)

Relationships with other family members such as children, grandchildren, or siblings also emerged as a source of negative emotions for many participants (n = 5; 45%). For example:

I feel upset because there are certain issues we [my children and I] disagree about - main, vital issues, and I used to feel very upset about it because they are young, they can’t see ahead, they just see under their feet, they can’t see ahead (P4)

Across past and current interpersonal relationships, a theme of abandonment and betrayal was evident in several participants’ narratives (n = 4; 36%). For example, Participant 3 spoke about her resentment toward her husband for being emotionally neglectful and invalidating throughout their marriage:

I feel really betrayed, yeah, absolutely betrayed, and nothing can make it better (*emotional, crying*)...I just feel angry with him, and I'll never forgive him, I've told him that, “I'll never forgive you”.
Participant 5 reflected on her ex-husband’s deception of herself and her children:

*I get angry and upset when I see people being taken advantage of, particularly if it’s close family, and being lied to, that sort of thing... Oh, if I found out I’ve been lied to - really a feeling of being betrayed.*

Participant 7 spoke about being ‘dumped’ by her family and estranged from her grandchildren:

*Oh, it would be how devastating my family’s been to treat me that way, to bar me from all my beautiful grandkids that I love... It’s been happening all the time through the generations. My ex told my daughter “Don’t let mum see the grandkids, then she’ll come back to me”, so my daughter did it to stop me seeing the grandkids, then my son said “I’m going to do that to you too”, so he did it. Then my other granddaughter - I’m a great grandmother - also did that to me, and this is going on. It’s not because of the hoarding, it’s because it happened a long time – they’re listening, they’ve done what the family’s done, now this granddaughter’s doing it now.*

Evident in several narratives (*n* = 3; 27%) was a theme of loss and violation in the context of family members making attempts at discarding their possessions. For example:

*Because the emotions when I came home from hospital with this broken ankle - my family totally threw everything out and completely de-hoard[ed]. I completely bought more and made it worse. And they did that on Mothers’ Day of all days - I didn’t even know they were doing it... Oh, I was devastated when I arrived home and nothing was there. I thought how am I going to start again, especially my Tupperware – I love my Tupperware – so I went out and bought lots of Tupperware again, and now I’ve got two – I went overboard with everything so I made it worse than what I was before. They should have not done that for me because it’s the worst thing they could do to a person, is do it without your permission (P7)*
I remember my mother-in-law and a friend of hers coming up to - this is a long time ago - my son's 38. When he was little and they came - I lost my health centre book and everything that day. They started a bonfire out the back and were just taking things out and getting rid of [them]... I was angry because I said to [my husband] how do they know what's important and what's not? They don't. None of them do. Nobody does. You don’t know what's important to me and what's not (P8)

My mother destroyed most of them and I was very upset for quite a few years because I specifically asked her to keep them but she blackmailed me - but it was such a rush, I didn’t have time to save them or protect myself (P6)

2. **Hoarding.**

All participants noted some aspect of their hoarding behaviour to be a source of negative emotions for them. For example, Participant 1 articulated several ways in which her hoarding creates negative emotions for her:

- *I think I get disappointed in myself, seeing the amount of clutter. I get frightened that the roof might cave in, so I get anxious, because there's that much in the roof. I'm embarrassed, it stops me having people over - I don't like to entertain anymore. It's frustrating because I can never find what I need, it's buried somewhere.*

Similar to Participant 1, many of the participants identified that clutter, the inability to find things, and the inability to have visitors over, were a source of negative emotions for them.

**Clutter.**

All participants experienced negative emotions as a result of mess or cluttered living conditions. For example:

- *I'm not happy about my home, of course, because it looks horrible. I feel uptight about it and upset (P4)*
There's a shame thing about the mess, because it's not just the hoarding of things with me, it is messy and dirty (P2)

Yes well definitely the clutter in the home and in the car is quite challenging in terms of – emotions? Yes, it's sort of stifling... Despair. Desperation (P10)

Well just confusion. Dismay...Not disgust, but embarrassment (P6)

Now that it’s hard to put a finger on it, it’s not sort of a feeling of desperation, it’s just a feeling of exhaustion I suppose, or feeling dragged down, sort of like it's just all too much to do (P5)

The inability to find things.

Many participants (n = 5; 45%) described negative emotions associated with being unable to find things in the home:

There's the burden, stress of not being able to find it, of knowing that you do have things, but they're misplaced, you can't - you do waste a lot - and that is another thing, I waste a lot of time finding things (P2)

Losing things frustrates me and I’m still missing a USB and a special note book. I can tear the place upside down looking for things or at least spend an hour or so looking for things sometimes (P6)

I feel stressed by it nearly every day. Like I can’t think, there mustn’t - there can’t be a day that goes by where I just go damn it, I wish I could find this thing - because I’ve got too much mess and I can’t see it, things like that. Or I lose my wallet. I lost my wallet for two weeks or I lost my keys for two months (P11)
The inability to have visitors over.

Four participants (36%) mentioned negative emotional consequences associated with being unable to invite guests to the home as a result of their hoarding:

*You just shut off the house basically then don't you? Less people come, you invite less people, you don't - have a way of not having kept up, and I do feel sad about that* (P2)

*All I need now is to be able to bring people into my house, which I haven't done, and my kids haven't done. That's where I feel sad. Because I've stopped them from having like a normal life, because everyone else brings – comes – you know, they have their kids, their friends over, and that's what the kids haven't been able to do... You know, how sad, and when my daughter says, you know, what did she say? She says, my life is - I'm really - she says, my life is miserable, and you're to blame for it. I understand why she says that, because her childhood from primary school - like I said, from grade 5 onwards - she hasn't had any friends over. That's terrible, and I can't blame anyone but me* (P3)


Throughout many participants’ narratives (*n* = 6; 55%) there was a theme of negative feelings about the self in the context of hoarding behaviour. In particular, feelings of shame and guilt were evident, which were linked to a need to hide or conceal. For example:

*Horror. I think the sort of shame thing that you haven't got it done, and you know, you've got some friends, and I could – like you know good friends – she said ‘oh you know I've come to see you, not the house’. I think yes, but I think like that's you laid bare and exposed, this is how bad I can be, or this is how bad it can be, I can be, whatever* (P2)

*I think I'm less likely to disclose my emotions about the hoarding, so as not to draw attention to it, or you know, it's something I'm going to get to. Don't worry, it's not going to always look like this, it's a work in progress. So I don’t actually talk about the true feelings* (P1)
Well a sense of shame, yeah. That goes very much with the sense of worthlessness and also the hoarding. I'm very ashamed of that, and the sort of mess I've made physically but also of my life. I feel trapped and yeah I feel overwhelmed. There’s a lot of, often feeling, overwhelmed… and guilty (P9)

Attitudes about the emotional experience

Three main themes emerged from participants’ narratives in relation to attitudes about the emotional experience: (1) Negative/critical attitudes, (2) Stoical attitudes, and (3) Health beliefs.

1. Negative/critical attitudes.

There was evidence of negative attitudes towards the emotional experience across the majority (n = 6; 55%) of interview narratives. These participants indicated secondary emotional reactions to the experience of emotions, or critical attitudes toward the self when experiencing difficult emotions. For example, when describing his experience of feeling fearful upon waking Participant 9 stated “I'm furious with it and I'm not having it, I'm not having it!” Other participants stated:

So I hate crying, I used to hate crying. I used to get more frustrated about crying than anything else (P2)

Probably annoyed with myself…. Always been annoyed, well, I guess I blame myself too for things. I'm very easy to blame (P8)

I feel that I am an inferior sort of person, unable to cope (P1)

...I don't punish myself but I sort of curse and swear and blame myself, yeah (P6)

2. Stoical attitudes.

A theme of having a stoical attitude towards the emotional experience was evident for a number of participants (n = 4; 36%), in which emotions were viewed as “part of life; you have to live with it” (P4). These participants appeared to have a
‘strong’ or ‘survivor’ identity that had been shaped by past emotional events or transgressions, and manifested in a stoical approach to the emotional experience. There were aspects of pride and accomplishment evident in the strong identity gained through surviving emotional events in the past. For example, from one participant who had experienced multiple traumas and loss over her lifetime:

...It’s been a struggle for me to get where I am. I’ve had to do it by myself, and I’ve done it and I’m proud of myself. People ask me now “How did you get over that and how did you do [it]? Can you help me now?”, but nobody helped me, I did it all by myself... Yes, strength – the strength to go on, to pick yourself up, and off I go again (P7)

After becoming tearful when talking about the emotional neglect she had experienced from her husband, Participant 3 reflected:

It's a funny thing, because I was a very, very vulnerable, very ignorant - I was 19 and a half when I met him, I was 21 and a half when I married him. But I think, god he really brought out the best and the worst in me. Because he's made me a very strong person, where I can stand on my own two feet, and I don't need him to talk on my behalf. So I'm really happy with the way things have turned out, because I'm glad I'm not this sad, sort of, you know, miserable woman that sits home and waits for things to happen... You know, and so I feel like I'm a real powerful woman.

3. Health beliefs.

Several participants (n = 3; 27%) identified a belief that holding on to emotions can result in negative health consequences. For example:

I think maybe I did grow up in a family where we weren't that emotional and I thought no, if I'm angry, I'm just going to show that I'm angry. Because that, you know those things, you know about people getting cancer once you bottle it all up. I think no, I... I'm not bottling it up (P2)

I have difficulty because I couldn’t put it out there, I kept a lot of things in, to the point that my stomach hurt, I had ulcers, so I used to hold them
in because I wanted to see how strong I was, so I’d be throwing up every day (P7)

It took me maybe a year or more, until at the end I found that I have to let it go – I have to let go...I just thought that, you know, there’s no benefit, I’m just going to destroy my health. I’m diabetic so I thought that my health is more valuable than continuing with this grief or whatever (P4)

In sum, the aim of the first research question of this qualitative investigation was to explore how individuals with clinically significant hoarding symptoms understand and experience their emotions. Figure 4 represents a pictorial summary of the findings from research question 1, with the shaded rectangular forms displaying the question areas, and the circular forms illustrating the main domains of responses drawn from participants’ narratives.

![Figure 4. Summary of findings on the emotional experiences of individuals with hoarding difficulties](image)

**Q2: How do individuals with hoarding difficulties attempt to regulate their emotions?**

This broad research question was addressed through a series of probes about how the participants attempt to manage their emotions and their beliefs about the effectiveness of their efforts. The following section will describe the pattern of responses drawn from participants’ narratives in relation to these question areas: ER
efforts for managing difficult emotions, ER efforts for inducing positive emotions, and effectiveness of ER strategies.

**Emotion Regulation Efforts for Managing Difficult Emotions**

The participants identified a range of ways in which they attempt to regulate negative emotions. Across the narratives, these strategies appeared to cluster under the following categories: (1) *Avoidance-based strategies*, (2) *Cognitive strategies*, (3) *Acceptance-based strategies*, and (4) *Behavioural Strategies*. In addition, acquiring was identified by many participants as a way of managing difficult emotions. As these descriptions revealed an emotion regulatory function of acquiring behaviour, these findings are discussed under research question 3.

1. **Avoidance-based strategies**

   All but one transcript (n = 10; 91%) revealed the use of avoidance-based strategies in an effort to regulate negative emotions. Across both cognitive and behavioural forms of avoidance, participants used terms such as ‘escape’, ‘avoid’, ‘switch off’, and ‘push away’ when discussing efforts to deal with difficult emotions. The following section provides examples of the various forms of avoidance used by participants to regulate their negative emotions, including cognitive forms of avoidance, behavioural forms of avoidance, and expressive suppression.

   **Cognitive forms of avoidance.**

   Some of the ways in which participants attempted to regulate their emotions were through internal mental efforts aimed at controlling or escaping from negative emotions. For example:

   *I think I just shut things off... I guess it's sadness, but it's sort of hidden. I tried to sort of, yeah, file that away, and sort of get on with life* (P3)

   *I think I'm more likely to not acknowledge things perhaps.... I think it just sort of numbs things down a bit* (P5)

   *More in my mental, like I feel like I'll just be like blank, like I just shut it off. I guess that's the shut off, and I think that's may be how I've dealt with - badly - with things from the very beginning and never being anxious about anything. I think that's what I realise I do, and I think probably*
maybe until the actual panic attack things, I probably did just manage to blank this out (P2)

...We talk about, we use this word anxiety but actually it’s just bloody raw fear - and I rally against it. I don't want to be governed by fear and so I’m trying to push it away most of the time (P9)

**Behavioural forms of avoidance.**

Evident across the participants’ narratives were efforts to escape from negative emotions via behavioural avoidance strategies, such as removing oneself for the environment/stressor, or doing something else or distracting via another task. These forms of behavioural avoidance are illustrated below.

Participants identified various ways in which they avoided situations, such as removing oneself from the home environment or source of distress, and using work as an avoidance-based strategy. Inherent in these descriptions was an effort to control or escape from negative emotions. For example:

*I try and not be home to see it, to run away from the problem. I can’t deal with the problem myself, I need somebody to help me* (P6)

*Yeah, well if I’m feeling overwhelmed I might just sort of get up and go out somewhere... Well, I think just removing you from the environment where you’re feeling stressed... I’d sort of whiz off and go and have a coffee or go to the opportunity shop or, you know, look around, things like that, and do bits and pieces* (P5)

*That’s what I did too – that’s another one I did – for not being inside to clear the clutter, is going out in the garden for quite a few hours (laughs) and just pottering around all day, and I don’t know what I’ve done, but... yeah, I’m pushing it away* (P7)

*One of the things I also do as an avoidance behaviour is like sleep a lot. So if I get really, really stressed about something I’ll just be like I’m just going to have a lay down and just sleep it off... I try – it’s kind of like a*
way of blocking things out and I know part of me realises that it just builds up, like things if I don't address them and all this avoidance behaviour, like leaving the house and going shopping and coming back with stuff or instead of just dealing with stuff. It builds up and builds up and builds up and I just pushed it away to the back of my mind so that I don't have to think about it (P11)

Several participants \((n = 3; 27\%)\) identified using work as a way of avoiding or 'escaping' difficult emotional aspects of home. When discussing how she managed difficult emotions regarding her relationship with her husband Participant 1 said:

*I think I just went to work. I worked all the time, under the guise of we need to save for this home... Yeah, well it took me out of that environment. But then maybe he drank more, and he's addicted to the computer. So he's always on the computer, and computer and wine, they go together. I think I just escaped through work.*

Participant 3 spoke about her tendency to overwork as a way of escaping from her home environment, and the consequences of doing so:

*Up until I'd started [the group], I think I used to punish myself. I worked for many hours, I worked 12 hour days, and I was escaping, and I realise now I was escaping from what I had caused. Not only that, and then I was doing markets, thinking that I was actually going to make some money out of what I was bringing home, because I could see I could make money if I got a bargain here then I could sell it [for] more. But I realised it was actually an escape for me...*

*...I was punishing myself, and I was punishing my kids because I'd be away from them. Not only was I doing shift work, I was doing 12 hour days, so I wouldn't see them either... You know, I've actually - you know, I've abandoned my kid and just, you know, going to work and sort of using that as an excuse of, you know, why I'm not here.*

In addition, using work as a strategy also appeared to serve a purpose of redirecting attention from difficult emotions and into another domain of their life that the participants felt good about. For example:
Well focusing on work is one way because I need to be organised and productive at the keyboard and creative... so basically it excludes any issues that may be - it generally does, excludes issues that have happened recently outside work... work was like a way of having to switch focus (P10)

...Whereas maybe work helps me focus, you know because I can walk away, and to me it's an escape, and I guess I've got an identity at work, I'm another person - and I love it (P3)

Many participants (n = 5; 45%) used terms such as ‘get on with things’ and ‘keep busy’ as a way of managing difficult emotions, with a focus on ‘doing something’ in order to minimise or escape negative internal experiences. For example:

Yeah I just - it's just you know, I just keep going, I just keep ploughing through and just do what I have to do (P3)

I have to get on with it again because it’s – I keep myself busy on that day and then get on with it (P6)

I go onto something else. I deal with something else. I go onto - and that generally gets you out of it, stops you thinking about it, stopping the thought processes is really important... Yes, doing something. Yes getting out there and doing something (P8)

Participant 5 spoke about doing things for others as a way of avoiding her own feelings of grief and loss:

...I think, you know, it’s just that soldiering on, managing, rah, rah... I suppose I do a lot of things for other people too, so I suppose that’s also being asleep to myself really, you know, my own needs and my own issues, things that are bothering me.
Participant 9 described how he uses anger to spur him into action, and how ‘doing things’ is a way of minimising or escaping difficult internal experiences:

...I’m trying to escape from those feelings. I’m doing things which reduce the pain... By anger. By just doing things and I do think if I’m not careful I’ll hurt myself physically because I’ll do things with such determination to get away from the feelings. Like it might be I need to do a task but I’ll wake up feeling incredibly fearful and not wanting to get out of bed, everything is seeming, feeling very unsafe, and eventually... So I might lay there for an hour and realise that I’m not getting back to sleep. It might be early. I’m not getting back to sleep, I can’t rest, I’m in turmoil and I’m tired. Eventually I will, without really thinking, rip back the covers and get out of bed, throw up the blind, flick the lights on, flick the radio on and (claps hands twice loudly) I’m furious with it and I’m not having it, I’m not having it! What’s this fucking fear about? Just get on with it... I force myself to do things and get on with the plans for the day which is - it could be building, it could be getting rid of stuff, it could be working on my block.

Participants also identified engaging in other behaviours as a way of escaping or distracting from negative feelings. For example, the most common technique identified by participants (n = 5; 45%) was the use of television, which appeared to be used as a method for taking attention away from negative internal experiences:

Well, you know, I might just watch television or something, so it's sort of just spacing out – trying to space out – from it (P5)

[Television] just feels very - because it's like, like it feels like a big sigh. Like a big sigh, and I'll just sink into the sofa and I'll just watch the television and I'll just switch off (P2)

Foxtel... well, it opened up a new world, it just became my escape... I don't have to talk to anybody and I can just stare at it, and I've even - I tape everything so that I can fast forward the ads. Yeah, I just become absorbed in it, and then I feel guilty (P1)
Four participants (36%) reported using food or tea/coffee as a strategy for regulating negative emotions, and a couple of participants (n = 2; 18%) spoke about using substances as a way of managing negative emotions evoked by the clutter in their home. For example, Participant 10 said:

Well if you call alcohol a way of coping that's (laughs)...... Well [it] sort of cover[s] the despair I suppose, or push[es] it away.

Participant 11 described using substances as a way of managing internal experiences such as anxiety and thoughts associated with the task of sorting and organising her clutter:

I turn to alcohol. Yeah and I smoke pot. Yeah, and I've noticed in the last say year or two, yeah, there might be a time when I might drink wine nearly, well most days of the week, just like I think I can’t clean, I can’t sort this mess out or I can’t organise this space unless I have a drink first... I noticed that in the last couple of years whenever I really thought that I needed to do something like that, or when I've said to myself okay I really want to clear this area here, I want to do some sorting or something like that, I've felt anxiety, and I thought well I just need to drink alcohol or have a glass or wine or maybe smoke some pot just to help. It sort of makes me feel more anxious in a way, it taxes my body but I feel like it switches off part of my mind that thinks how am I going to do it? Like if I'm doing it in a haze there's less anxiety or there's less thinking processes, I'm just doing it. It's like I don’t have to think what I'm doing, I'm just doing it.

Expressive suppression.

Expressive suppression was a theme evident for many participants (n = 5; 45%) in which participants avoided acknowledging or expressing their emotions – “it’s just putting on like a persona of being not affected by emotions” (P1). Some of these participants thought that suppressing their emotions was necessary in order to get on with doing things, and that putting on a ‘strong persona’ served a protective function for the self and others. For example:
...probably dampening down my own emotions to deal with things. So I know in my marriage, my husband’s not dealt with a lot of things and so it’s had to fall back onto me, and so you can’t be a blubbering mess. And some situations where I would have liked to have just sat down and had a good cry and things, I’ve just had to keep going...Yeah, looking back on it I think probably a lot of it was that I’ve just got used to not showing fear or emotions, and so I’ve been seen as the strong person, a person who just can manage an enormous amount of stuff, and probably I have (P5)

...I had to be strong by not showing it, but deep down it was really - because I had to make out it wasn’t hurting me, the bullying and stressing that I was getting by my ex-husband (P7)

Several participants (n = 3; 27%) identified a past tendency toward expressive suppression in relationships, although they noted an improved capacity to express emotions over time. For example:

...he didn’t realise that he was putting me down all the time over the years and I have since come to a spot where I can actually tell him, and that has made an enormous difference. He said to me "why didn't you say something" and I said "I didn’t know." I was frightened (P8)

I mean it’s perhaps only the last 10, 15 years that I’ve got to know myself a bit better and I think of the relationships I had prior to that and I realise how completely I was driving blind in them. Largely because I didn’t know my own psychological landscape and was dealing with some really powerful drives and complexes and being deeply introverted I forget to make those thoughts, convert them to language and express them. Yeah, it just doesn’t occur to me. I realise later I’ve had a strong feeling about something, when I’m with someone, and I bury it or just kept it private and I think well why the hell did I do that, why didn’t I just name it? But that would never have occurred to me in the days in which I was unconscious of those, of those inner dynamics. Whereas now, I’m more conscious of my own workings and landscape if you like, thought
and feeling landscape, and I’m more comfortable in the right situation in
learning, in expressing that. But if I’m at all anxious with that person or
those people, then that, I keep that private (P9)


While the use of cognitive strategies was not as prominent as the use of
avoidance-based strategies across participants’ narratives, several cognitive strategies
were revealed for managing negative emotions, such as the use of cognitive reappraisal
and the use of a faith or belief system.

Cognitive reappraisal.

Several participants’ narratives (n = 3; 27%) revealed the use of cognitive
reappraisal as a way of feeling better about one’s situation. Inherent in the use of this
strategy was a comparison to others, an acknowledgement that things could be worse,
and a sense of gratitude that things are not as bad as they could be. For example:

I stop and think of how lucky I am I guess. Because things could be so
bad. So that keeps me going. I feel like so privileged with what I’ve got...
Yeah, yeah, like you know when you see things that are so bad out there
you think things could be so different (P3)

I might say well I haven't got cancer, you know there's worse off than me
(P1)

Like, if I had an accident – if I’m in a car accident for example – I look at
the positive side and thank God that I’m not dead or I’m not crippled, it’s
just a broken arm or something and I can live with it. I look at the
positive side of the things (P4)

Reappraisal was also evident in the narratives of several participants (n = 3; 27%)
who spoke about reprioritising or adjusting their expectations as a way of
reducing feelings of distress or overwhelm. For example:

Just start small and then – the other thing I do is that I’ll often use a sort
of analogy, I forget where I came across this or who told me but it’s the
farmer who instead of saying to his wife in the morning ‘I’m going out to
plough that field, the north paddock’ says, simply says ‘I’m going out to plough’ so he doesn’t burden himself with an end result. There’s an awful lot that can go wrong or it might go quickly, it might go slowly, he doesn’t know, so he’s going out to plough. I’ll often say that to myself, just go out and plough (P9)

Let's just concentrate on throwing away some stuff that you know - that you don’t need, and with the aim of just having a little bit more space. So I forgot about the bookshelf, I forgot about the shoe rack, I just went okay this little thing here, let's just try and clear this table... I think because I didn’t have that much pressure on myself. I hadn't placed that pressure on myself to get something done, it was just like oh let's just do this before I pack my bag for tomorrow. So it was spontaneous. There wasn’t that build-up of pressure, anxiety (P11)

A few participants (n = 3; 27%) identified making cognitive evaluations of the pros and cons of being upset. For example, when speaking about being upset with her children and arguing with them, Participant 4 stated:

...My health’s important and I evaluate the situation. If there’s use of doing that, what is the result? If there is a result, maybe I can keep going, but if there isn’t a result in the end, it’s useless and I’m wasting my breath

Similarly, Participant 8 reflected:

I've also come to the realisation that sometimes it's a waste getting annoyed about some things because I know they're not going to happen... I think to myself well that’s stupid, it’s a bit of a waste if I spend too much time on those sort of things because I can’t change them. If you can’t change something then why do it?
Faith/belief system.
Two participants (18%) identified that they used a belief system as a way of addressing emotions. For example, Participant 5 described herself as a ‘faith spinner’, and draws on psychological and spiritual tools for self-understanding:

I’ve studied Enneagram, which is personality stuff – and each personality type has – well, I suppose one way of saying it is your greatest gift is your worst enemy. So I’m what they call a peaceful or a nine, and so you know, I’m probably not one that acknowledges my emotions as much, but to move to another space of one of the other personality types, as one of the other personality types, look at that, you know, where the strengths are, where my weaknesses are, and acknowledge that “Oh gee, I’m going to that space”.

Participant 4 described how her Islamic faith is helpful for managing her emotions:

I try to recite Qur’an, because when I recite Qur’an I feel inner peace, or I feel – I get a positive feeling, and yeah, the negative feeling disappears.

3. Acceptance-based strategies.
Two participants (18%) identified the use of acceptance-based techniques for managing difficult emotions in which accepting, acknowledging, and not resisting the emotion were key components. For example, Participant 5 stated:

... Because quite often, you know, if I’ve got a negative emotion or I’m feeling a bit shaky or something, it’s when I can actually acknowledge where it’s coming from it’ll go, so... if I had any anxiety, when I could actually put my finger on what it was, it was okay.

Participant 9 spoke about using present moment focus when doing tedious tasks:

... If I’m not saying to myself well shit, I’ve got another 10 of these to do, I’m just focusing on this one - that helps... Yeah, more in the moment and relaxing... Because what I find throws me, gets my anxiety up, is the outcome, is shit how slow this is, it’s going to take me forever, and
whereas if I just focus on scooping away and not putting myself under pressure, I get a sort of strange satisfaction out of or pleasure out of just doing that routine thing. I wouldn’t call it pleasurable but it’s the absence of the anxiety.

Participant 9 also described a process of surrendering and non-resistance to painful feelings:

Sometimes I will just - and this happened on the weekend. I spent the weekend alone and I was feeling very lonely and a little bit sorry for myself and I just said to myself ‘Okay well don't resist that, don't resist it, just feel that’... And move, move through it. It moved and I said ‘Okay I’m alone, that’s okay. I’m alone’. What - is it so terrifying? It wasn’t when I accepted I was alone.

There is a place I can go where I give up if you like. Give up sort of hopes and things and that may cause some tears initially. But then beyond that there’s this sense of, well I’m okay. I’m not, I’m not – I’m safe in myself, there’s a place of... There is – I find it very hard to go there because the process – I want to resist the reality of being alone or a bit nutty or whatever. But when I do allow the reality of that to sink, for me to sink into that, and I just say this is it, then surprisingly it’s not always panicky, it’s not always terrifying.

4. **Behavioural strategies.**

Several behavioural strategies for regulating negative emotions were identified by participants, including the use of recreational strategies, relaxation strategies, and help-seeking behaviour.

**Recreational activities.**

Some participants identified engaging in recreational activities such as exercise or creative pursuits as a way of regulating difficult emotions. For example, several participants (n = 3; 27%) reported that they use exercise (specifically walking and/or yoga), as a strategy for managing emotions. Participant 11 described her experience of yoga:
... I come home from doing a session of yoga and I just go yeah I’m so awesome. I feel great, I’ve just done the best thing that I could possibly do for myself. I feel relaxed, I feel good, I feel centred and calm... I’ve done something good for myself which is good physically because it helps me with the pain, it calms me down emotionally, mentally - all that stuff.

Several participants (n = 4; 36%) identified how engaging in creative tasks (e.g., writing, singing, playing music, drawing) has been helpful for shifting negative mood states. For example, Participant 5 described her creative strategies:
Yeah, well one would be sometimes I’d write things down and then screw it up, and one of those is singing (laughs), so if I’m really angry about something I might sing a song about it in the car, you know, go for a drive and sing about it at the top of my lungs... I think perhaps it just vibrates through your body, you know... Well, it’s sort of like an acknowledgment of it and it shakes it out a bit I guess.

**Relaxation strategies.**
Some participants had previous experience with relaxation-based strategies such as deep breathing (n = 2; 18%), and meditation or relaxation via CD or phone application (n = 4; 36%). For example, Participant 9 described:
But if I’m entirely by myself, then I’m looking at – with a sense of despair at my situation and I try and – I may sit down and try – because I don’t feel very well physically and might breathe, try and breathe my way through it.

Participant 2 also talked about her use of relaxation-based strategies for the management of panic symptoms:
Trying to do more proper deep breathing, I don’t know if that makes sense, the deep breathing and actually I started doing it in the mornings and I’m supposed to do it in the day. But I don’t always think to, and on my phone I’ve got an app for thoughts, because it was fear, and I’ve got a kind of meditative CD. But it goes on quite long, and then I tend to fall asleep, which is lovely, but it’s not helpful in the end, and then
mythoughts.com does a - there's a happiness one and they've got lots of
different ones, and I quite like that.

**Help-seeking behaviour.**

By the nature of their inclusion in a therapeutic group program for HD, all
participants demonstrated help-seeking behaviour. However, most participants ($n = 6$; 55%) had also sought therapeutic help from health professionals in the past. For example, Participant 9 recalled seeking professional support specifically for learning how to manage his emotions:

> I went and saw a friend, actually it was a colleague of mine, a social
worker and counsellor and I said to [him] “I’m not making sense of this
anymore and I need help. I just can’t... I feel like I’m approaching a
crisis”, and by this stage I was married, and so I started seeing this
psychologist, very good, Jungian in perspective and I can’t remember, I
think I said something like “I don't know what to do with my feelings, I
don't know how they should - how I should respond to them” and I at that
stage was trying to solve everything rationally – everything - and getting
nowhere.

In addition to seeking professional help, many participants ($n = 6$; 55%) identified seeking social support and externalising feelings to friends to ‘get it off my chest’ (P3) as useful strategies for dealing with their emotions. For example:

> I ring a friend or talk to someone, ring a helpline... [which helps by]
problem solving, sharing problems ...I get ideas of how to help myself
and just feedback from the other people (P6)

> I'd call my friends or I'd text them and I whinge to them about it. I've
always been really good at that actually. Yes, put a big red star next to
that... I've got a good social support network. I really do. It's one of the
best things I've got in my life actually to deal with all the shit that I've got
(P11)
Emotion Regulation Efforts for Inducing Positive Emotions

In relation to enquiries about how participants attempt to bring about positive emotions, the pattern of responses across the narratives clustered into three main themes: (1) Activity engagement, (2) Lack of strategies, and (3) Acquiring. With regard to the first theme, participants typically reported that they make efforts to induce positive emotions through engaging in things they enjoy, such as those described in the previous research question under ‘sources of positive emotions’, or via some of the aforementioned strategies for managing negative emotions. For example, participants identified activities such as gardening, spending time with others and/or animals, watching television, engaging in recreational activities, or seeking social support as ways of inducing positive emotions.

In response to this area of questioning, several participants (n = 3; 27%) identified a lack of strategies for eliciting positive emotions. For example, when describing how she attempts to bring about positive emotions Participant 11 stated:

*I think I tend to do it in a lot of avoidance, avoidance behaviour stuff like stopping doing something which I think might be bad, instead of actively going and seeking out something which can be good.*

Likewise, Participant 9 reflected:

*It’s the absence of the negative and unfortunately a lot of my life is about seeking the absence of the anxiety, not seeking more positive pleasures which I can name.*

Of note, acquiring was identified by many participants both as a way of inducing positive emotions, as well as a strategy for escaping negative emotions, and will be discussed in detail in research question 3.

Effectiveness of strategies

With regard to this area of questioning, participants identified whether they had effective strategies for managing their emotions. Although several participants (n = 4; 36%) perceived some of their ER strategies as being effective, the majority of participants (n = 7; 64%) did not believe that they had effective strategies for regulating
their emotions. Within the participants’ narratives there were a few key reasons for perceiving one’s strategies as ineffective:

1) Participants perceived that they had no ER strategies, or made no conscious attempts to regulate their emotions. For example, during his interview Participant 10 struggled to identify his efforts at ER, and therefore did not believe he had any effective strategies:

   No, I probably don’t because I've not really explored - I've not really ever tried to - as I said it's generally just ride it through, not try to interfere or resolve or improve them.

   Likewise, the interview process itself seemed to reveal to Participant 11 that she did not have effective strategies for improving negative emotions:

   I think having this conversation with you made me realise yes I don’t have effective coping mechanisms. I really don’t. I don’t think I ever have… It's kind of like I'm not actively involved in making it go away.

   However, throughout her interview, Participant 11 revealed the use of both effective strategies (i.e., yoga) and maladaptive strategies (i.e., substance abuse) for regulating emotions, which indicated that she had trouble recognising her ER efforts. One description revealed a lack of knowledge about effective ways for managing the distress associated with sorting and organising her possessions:

   I'm going to just – fuck this, I'm going to pour myself a glass of wine even though I know it's not what I should be doing. There's got to be other ways to do it, but not knowing what the other ways are.

2) Participants were not utilising strategies that they knew about and were available to them. For example:

   ...like see up til a couple of years ago, I said oh no - I would have said oh no, I deal with emotions, I'm very you know - you know - I’ll admit them but, you know, or articulate them or say when I'm angry, if I'm angry I'm angry, or you know, I'll do yoga. I know that you need to exercise. But a lot of that - and I don’t know whether
that's that nurse thing too - a lot of it we know what we're meant to do. Like an emotional release or stress relief, you do exercise. But we don't always do it. I know I don't exercise as much as I should… and I guess I sort of saw that as being weak willed. I don't manage it (P2)

Participant 9 spoke about his reasons for not regularly using strategies for managing his anxiety:

A sense of time lost and maybe, maybe a resistance too. How can I put it? I just want to get on with my life and I guess at one level I resent having to go through putting time aside for these practices when I simply want to get on with my life and feel okay about it. So there's some impatience if you like.

3) Participants had access to strategies, but believed them to be only effective in the short-term and not actually addressing underlying emotions. For example:

Well yeah, but they're not really dealing with the issues… I mean, dampening down your emotions, in the long term that may not be helpful, but in the short term when you've just got to get through stuff, it's essential really sometimes – it's really sort of essential (P5)

Similarly, although Participant 9 used social contact as a strategy for managing his anxiety, he did not perceive this to be effective given that it does not address the underlying anxiety:

So I feel that I don't relax even if I do go out and see someone. Yeah I don't relax. I know I'm just putting off the inevitable. I'm kind of sitting on the anxiety. I'm trying to wish it away.

Likewise, despite using cognitive strategies for reducing the anxiety associated with the responsibility he feels for leaving his possessions (i.e., cars) out in the sun, Participant 9 was critical of their effectiveness.
Inherent in his descriptions was the notion that his strategies were superficially effective:

I’m trying to say “oh well in the scheme of things it won’t be so bad” or I might say to myself well - it’s a bit of a dishonest trick but it sort of works... I think “well let’s just assume that happened before in its life, before I came along as its custodian”... It sort of says well I’m not wholly responsible. Also, I mean I had a thought this morning, I said “well okay, if it gets a crack on the dash, the next day I’ll just have to simply deal with it”. But I don't feel – look it’s - it’s not a big relief. It’s scratching around looking for a way out, it really is.

Within the participants’ narratives about the short-term effectiveness of their strategies was the recognition that such strategies were ultimately problematic in the long-term, as they often exacerbated negative emotions and had long-term negative consequences. For example, when reflecting on her use of avoidance-based strategies Participant 2 stated:

In fact in the end, they're just compounding the problem, but at the time I guess it's just a bit of a release valve, or my way of slowing down or switching off I guess.

When discussing the effectiveness of her use television and shopping as an ER strategy Participant 1 reflected:

They're effective, but I don't think they're helpful...Well they manage to achieve a reduction in anxiety, and they give me pleasure, but then, as I said, at the end of it all, it just creates the guilt again that you're weak, why have you gone into that, what have you achieved, nothing. What crap have you bought? Because really, I probably spend I don't know $70, $80 a day on crap. So then I feel guilty...They're only short term effective.
Participant 11 had an awareness of the long-term negative consequences of using alcohol for managing the difficult emotions associated with sorting and organising:

Well I know that it's not a good thing to do. I know because it's relying on substances to get you to do something which is just not on and my mother's an alcoholic and she's a hoarder too. She's in full on denial about her alcoholism though and even I worry about drinking small amounts of alcohol and especially when I think to myself I'm going to have a drink so that I can get this done. That's just dodgy. I know it's not good in the long term but it's like short term - it's just like, but I just want to get this done.

In sum, the aim of the second research question of this qualitative investigation was to explore how individuals with clinical significant hoarding symptoms attempt to regulate their emotions and their perceptions of the effectiveness of their ER strategies. Figure 5 displays a pictorial representation of the main findings in relation to this research question.
Figure 5. Summary of findings on the emotion regulation efforts and perceived effectiveness of strategies of individuals with hoarding difficulties.
Q3: How might emotion regulation be implicated in hoarding behaviour?

This broad research question aimed to obtain an understanding of the emotional bases of hoarding behaviour and whether aspects of hoarding might serve an ER function. The following section will describe the pattern of responses drawn from participants’ narratives in relation to these question areas: whether emotional incidents are related to hoarding behaviour, how aspects of hoarding behaviour might be helpful for managing emotions, and the role of possessions during periods of emotional upset.

Emotional factors related to hoarding

Most participants identified past emotional incidents or conditions that they believe were associated with the onset or exacerbation of their hoarding behaviour. The pattern of responses about emotional incidents linked to hoarding clustered into three themes: (1) Material deprivation, (2) Loss, and (3) Difficult emotional conditions.

1. Material deprivation.

Many participants (n = 5; 45%) believed that their hoarding was, in part, associated with experiences of material deprivation in childhood. These experiences ranged from a home environment characterised by frugality and a lack of luxuries, to experiences of severe deprivation or neglect. For example, Participant 1 recalled:

*I suppose because as kids we didn't get anything really much. Well my parents were alcoholics really, so all their money went on grog, and they just didn't have that for Christmas and birthdays and stuff like that. Not that we were unhappy, like the three of us would get together. But then sometimes you'd think, bloody Father Christmas, look what he's brought my cousins, prams, dolls, what did I get? What have I done to him? It was that sort of stuff, how come he doesn't like me?*

At the more extreme end, Participant 7 experienced a traumatic upbringing, being born under war conditions and receiving no milk as an infant. After migrating to Australia she experienced further material deprivation and loss:

*Oh yes, the loss was when we came out here to Australia and then when my parents separated, so we lost everything again, put in orphanages, nothing in the orphanage, hungry, needed clothes, didn’t have clothes, always hungry too.*
Participant 11 also described an upbringing characterised by squalor and deprivation:

[I] grew up in Queensland, we were quite isolated in the bush and we always lived in a house which was really messy. My mother and father never seemed to really do any housework, even sweeping, that sort of thing. Dishes were cleaned because you needed to eat food off clean dishes but there was no real housework done by anyone and we had a lot of dogs in the house. My mum used to breed dogs and they would poop everywhere... So yeah, it was a really bad situation... We didn’t have much money. I remember we didn’t really get much during the year in terms of things exciting like toys or anything like that... That’s right, when I was at school my mum and dad never fed us very much and we never really – I remember being hungry all the time when I was at school. I’d come home from school and I’d be really hungry and there would be nothing to eat. We’d be lucky if we had like a loaf of white bread and some butter in the fridge when we got home. There wouldn’t even be peanut butter in the cupboard, that sort of thing... But yeah one of the things that I really hated about my childhood was yeah, just always going hungry. Even now whenever I leave the house I have food in my bag. Like there’s food in my bag now.

2. Loss.

A few participants (n = 3; 27%) speculated that the onset of their hoarding behaviour might be associated with loss in childhood in the context of moving or migrating. For example, loss is evident in the aforementioned description by Participant 7 of her experience after migrating to Australia. Participant 8 reported that due to her father’s work the family experienced inter-country and interstate moves frequently, which was associated with loss of friendships and a tendency to hold onto things for sentimental reasons. Participant 2 also experienced difficulty parting with things that are emotionally significant after migrating to Australia.

Another participant spoke about experiencing loss in her forties, including the death of her parents and the loss of her boyfriend, and identified that she increased her scrapbooking hobby as a way to cope with the loss:
...I lost my boyfriend during that time and I started to do something to cheer myself up... When I lost my boyfriend and went to the scrapbooking consultant and I spent lots of money to get the kit and things to develop my hobby... It took my mind off it... I did a memoir album of my parents, travel and family albums. Spoiled myself I suppose (P6).

3. **Difficult emotional conditions.**

The majority of participants (n = 6; 55%) appeared to have experienced difficult emotional conditions during childhood, which ranged from feelings of being ‘lonely, ‘isolated’, or ‘unheard’, to experiencing traumatic conditions such as having an alcoholic parent (n = 3; 27%), domestic violence (n = 2; 18%), and neglect (n = 2; 18%). Some examples from participants’ narratives about emotional conditions during childhood include:

*I suppose a bit of rejection. They were quite self-absorbed, but I think alcoholics are a bit like that. They sort of edged each other, and even though they fought a lot, they actually depended on each other to drink, so they both had a free-for-all... We just used to go in the bedroom or you know - the next day, it was humour, and just not acknowledge that anything had happened. There might have been soup up the wall and bowls broken and stuff like that, but we didn't acknowledge any of that (P1)*

*Loneliness, frightened, boredom. Possibly apathy, feeling I’m missing out (P6)*

*I didn’t feel anything then, it was just loneliness, even in the orphanage. I used to get up every Sunday and cry you felt so alone... The nuns were very cold, they didn’t have any emotion either in those days (P7)*

A few participants (n = 3; 27%) also identified difficult emotional events in adulthood that they believe were linked to exacerbating their hoarding behaviour. For example, both Participants 3 and 7 had experienced emotional invalidation and
financial control by their husbands, and recognised that once they had some financial independence, they overcompensated by excessive spending:

Yeah, just because I’ve never had all those things all my life. I only started about 15 years ago when I got this Housing Commission unit because I’ve never had my own money, it was taken away from me my money, and I just went a bit berserk, I went too far and just kept on op shopping or, you know, go from one place to the next place, and that’s how I acquired what I’ve got and it’s gone beyond… I just let go, I went berserk on my own. It was a good feeling. Yeah, and the money – pension money – to spend on myself (P7)

My husband was very controlling financially, and so he would take all the money, and the purpose was so that we’d pay off the house, which is fine… So for I don’t know how many years, he had total control of the money… He would leave me with very little money. So for a long time, I was on a minimal sort of spending thing, so I think because I had very little money, that was the only thing that I could afford - op-shops. I used to love op-shops. So when I went back to work when the kids - because I kept working, and up until I think I made a decision that no, I’m going to keep the money that I make - and then it was like this is my money, and I'll do what I want with it. I think that's when things went out of control. It was like my way of saying, you know, you can't boss me now (P3)

In addition, Participant 3 attributed her increased spending and out of control shopping behaviour to her husband’s emotional neglect in the context of a dispute with extended family:

That's when I think it just went out of control… I guess I think that's how I was coping, because I think I can pinpoint it with that incident.

Aspects of hoarding serving an emotion regulation function

Hoarding behaviour emerged in many participants’ narratives in relation to the previous two research questions. That is, many participants identified their hoarding as a source of positive and negative emotions, and directly stated that they used acquiring as a strategy for managing emotions, revealing that their hoarding behaviour might
serve an ER function. For others, probing about specific hoarding behaviours was required to obtain an understanding of the emotional functions of these behaviours. Although participants were able to identify negative emotions associated with clutter and discarding behaviour, the participants’ narratives did not reveal prominent themes relating to an emotional function of these aspects of hoarding. In contrast, descriptions about acquiring behaviour and possessions revealed several themes which appear to reveal an ER function. As such, the following section describes the themes that emerged from participants’ narratives across the entire interview in relation to acquiring behaviour and the role of possessions.

**Acquiring**

For the majority of participants, acquiring behaviour appeared to be used as an ER strategy which provided the dual function of (1) *Escaping from negative emotions* and (2) *Inducing positive emotions*. These two themes are illustrated below.

1. **Escaping from negative emotions.**

Most participants \( n = 7; 64\% \) identified that acquiring was a way of escaping from negative emotions and/or situations that are associated with negative emotions. For example:

*The feeling I think was it would just feel nicer to be able to go in there than frankly to go into the car and go home... So I recognised before that I thought it was an avoidance of being at home* (P2)

Participant 3 spoke about how she managed the negative feelings of betrayal and neglect by her husband:

*I just shopped, shopped, shopped, shopped, shopped. I just escaped, and I was a part time worker then, so I had a lot of time up my sleeve, and I just shopped.*

Similarly, Participant 4 spoke about how shopping became a way of addressing her depression:

*If I used to be depressed I used to go clothes shopping, new ones, so yeah, I used to buy lots of things – lots of things... I think it took my mind off the depression by concentrating on something else, or maybe when I go out*
and, you know, a different environment; it works anyway – I don’t know how, but it works...I forgot about the depression. I can’t say I’m happy, but not depressed.

Notably, Participant 11 identified how she had used shopping as a way of alleviating feelings of anxiety or emotional upset activated after her psychology sessions:

*Like I used to see a psychologist on XXX Road and if I'd feel upset after that - just from talking about stuff and getting emotional or stressed or anxiety, just talking about stuff, coming out of it sort of wiry and sort of anxious and stuff - I'd say to myself ‘it’s cool, I'm just going to go shopping’ and ‘I'm just going to go to Savers’, the place that I go to. ‘I'm just going to’ - it's just down the road. It's really bad having a psychologist clinic right down the road from Savers I swear. ‘I'm just going to’ – ‘yes it's cool, I'll just relax the rest of the day, just go shopping after seeing them and it'll be really nice’ and I'll go there and I'll be just like [makes humming sound] and yes it has been relaxing - I think for me because I block everything out. Whoops! Or I forget my troubles, or I unwind by hunting for little treasures. Whether or not that's a positive coping mechanism or effective, yes I've done it heaps of times.*

2. **Inducing positive emotions.**

Nearly all participants (*n* = 10; 91%) were able to identify that acquiring provided them with a sense of pleasure or positive feelings. The act of acquiring appeared to induce a range of positive emotions, from pleasure and happiness to feelings of high arousal. For example, when speaking about their acquiring behaviours, some participants described their feelings in the following ways:

*...Pleasure, happiness. Fulfilment (P6)*

*Well to make yourself feel better, you know, you do those emotional things, you know, you buy yourself something nice...It just makes you feel better when you have acquired that thing, you know, you’ve bought*
something you like, you know, and sometimes it doesn’t even fit, but you buy it (P7)

You get that little bit of a buzz (P2)

At the time, I'm in a frenzy, and it just seems the most important... It's like a high (P1)

Participants’ descriptions about their acquiring behaviour appeared to reveal positive emotional functions which clustered into three areas: (1) Gratification, (2) Opportunity, and (3) Identity/self-esteem.

Gratification.

Within participants’ narratives about acquiring behaviour, a theme of gratification emerged, with descriptions referring to an addictive element and short-term gratification. For example:

It's almost like you've got this addiction - of you know coffee or whatever it is, or cigarettes... (P3)

It's so intense, and oh, look, then I sort of you know, justify - look, it'll be a quick look. You don’t have to buy anything, you know. It’s like I can't not go. That annoys me... Yeah, that you're weak (P1)

So a big question is why I have a - take pleasure in acquiring more when I’m not really taking pleasure in looking after or using the beautiful things that I do have. Why it keeps on going, it’s like an addiction (P9)

Like I’ll look around and there will be a lot of stuff that every once in a while you’ll come across something which is really shiny and pretty and you just go ‘Ohh’ and you get this adrenalin level and you just go - it just goes ‘ping!’ and you go wow and there’s that - so you want to do it again. You grab it and then you want to do it again so you keep looking and you see something else and you just go ‘ping!’ and it’s like, I think also like maybe like pokies or something, pokie machines, poker machines. Like I
have an older sister who was addicted to poker machines and it’s like you sit there and you feed coins into a slot and every once in a while you get this return and your adrenalin levels will go up and you go alright well how about we do it again because I want that adrenalin rush (P11)

Two participants specifically identified that acquiring was ‘short-term gratification’ for them. For example, Participant 11 described her impulse to acquire something as:

*Kind of slightly debilitating. Yeah to feel like I need to do something which really doesn’t do me anything good, like I don't really... It’s not - I’m not really gaining anything meaningful out of it. It seems just like a short term – I know what it is. It’s, what do you call it? I had a word for it for years – this word. An immediate gratification. Immediate physical gratification, and I’ve had those words to describe a few things in my life, whether or not it’s food or a buzz from alcohol or something like that, or sex maybe... I don't think I allow myself or I know how to give myself positive experiences which are more meaningful and long term and positive in a realistic way.*

Difficulties with impulse control appear to be inherent in some of these descriptions. Four participants (36%) spoke about difficulty controlling their impulses when acquiring, and this appeared to mainly relate to positive urgency. Indeed, positive urgency is evident in some of the above descriptions, suggesting a loss of control over acquiring behaviour due to the physical and emotional gratification experienced during shopping expeditions. Negative urgency may also be evident in relation to acquiring behaviour, given the descriptions in the previous section about shopping being used as an escape from negative emotions, or in response to an emotional trigger which precipitated out of control acquiring behaviour. While presumably all participants with excessive acquisition behaviour experience some difficulties with control over their urges to acquire, interestingly most participants did not self-identify as having impulse control difficulties when specifically asked during their interviews.
Opportunity.

Participants also identified particular aspects of the acquiring experience that they derived positive emotions from, which were conceptualised under the theme of ‘opportunity’. This theme related to positive emotions evoked through ‘getting a bargain’ and the ‘thrill of the hunt’. For example, many participants (n = 5; 45%) identified positive emotions elicited by bargains:

Yeah, I feel happy if I buy something – of course I feel happy if I buy something I like – or if I go to op shops and find some bargains, I feel happy about myself (P4)

I just went out and I just bought things, great bargains, I love it, and I felt like on a high (P3)

Similarly, several participants (n = 3; 27%) spoke of the pleasure derived from the ‘thrill of the hunt’ and anticipation of finding a ‘treasure’. For example:

Yeah the pleasure of finding something fantastic. Not that I need it, but you know, some sort of treasure... Yes, that's the thrill of the hunt. I've actually shopped, and left the shopping there. I've come back a couple of weeks later, and they've said, oh, last time you were here you left your shopping. I didn't even know. So it was just finding, imagining what I'm going to do with it, paying for it - that's it (P1)

Identity/self-esteem

Acquiring behaviour also appeared to be an avenue through which participants derived a positive sense of identity or self-esteem. For example, many participants (n = 5; 45%) described feeling ‘clever’ or ‘creative’ with regard to their acquiring behaviour:

Just look at this, how clever was I. Some idiot's walked past that, hasn't seen the value, me clever Dick knows... I get home and I resurrect them, and I clean them, and get a toothbrush out, and then I just shove it in the cupboard (P1)
Participant 5 defined herself as an artist and creative person and identified how shopping is useful for her:

...So you’re sort of looking around at stuff and you’re thinking “Oh gee, I could put this here, I could put that there”, you know, the creative juices are working... I think it’s just a – like, looking at things in a creative way, it’s a positive outlook.

Several participants (n = 3; 27%) also appeared to derive a sense of self-esteem from acquiring for the purpose of gift-giving, which was associated with feelings of generosity, and the approval or acceptance of others. For example:

Well it's helpful because it makes me happy really, and I think of you know it's a future project, going through it all, and then sort it out, and give away presents. So I wouldn't have to buy Christmas presents because I can go through and allocate all the stuff to various members of the family. If it goes to a home, I'm happy. But so I suppose that's what it does for me, it just makes me feel that I've got things to properly buy people. I tell the grandkids, you can call me “nanna presents”...I want to be liked by everybody I suppose. I might be a bitch, but you get presents (P1)

The Role of Possessions

The qualitative findings revealed that for some participants there appeared to be an emotional basis for the need to hoard and save possessions. The following section describes these findings, which revealed a sense of security/safety and emotional comfort derived from possessions for some participants, and anthropomorphism for one participant. The findings on whether participants relied on possessions during periods of emotional upset are also discussed.


For several participants (n = 3; 27%) the hoarding of objects represented a source of safety or security, and appeared to be associated with fear of deprivation or loss. For example, Participant 7 identified that hoarding clothing and food was related to the deprivation she experienced during childhood, financial deprivation from her ex-husband, and losing all of her possessions and money several times during her life:
Fear – you’re fearing – I feel fear, the fear of insecurity of nowhere to live, to start all over again, that’s all fear, it’s scary. Yeah, and then I started holding on to stuff after that because I don’t want to lose it again... Yeah, it’s a feeling that that was my security all those clothes that I hadn’t had, because I used to have dreams about being naked running in the street because I had no clothes; that’s my dream often... loss... I only stored food as well because I was insecure. I felt my family dumped me too, so... Yeah, insecure because my family dumped me when I asked for help.

Participant 2 spoke about how her hoarding of possessions was associated with feelings of safety against future financial loss:

I don't know, is it save it up against the apocalypse, or the hoard - as in the hoard, siege mentality I think... I think it just made me - with the worry that one day - like say I've got a lot linen. I think, I just remember thinking even then - so what would that be 20 years ago, whatever - that you know, if I have this now, even if I have no money - whether that's no job, no money, whatever - I will have these things. I won't have to buy them. I don't know whether that made me feel safe then... to make me feel safe. Self-sufficient maybe, that then I didn't have to depend on anyone else.

This participant became emotional in session when speaking further about her hoarding, revealing that her possessions serve a purpose of preventing feelings of potential loss:

Maybe that idea that things can go just as easily as they come, I don't know... I think loss, loss I think. So I don't know, impermanency of things, I don't know. All of a sudden I'm sort of thinking oh - yeah, I don't really think it through, I just think oh, I just don't query it I suppose unless somebody asks. But so what is it? I think yeah, for whatever reason, you can lose it. I don't know why, because it's never actually happened to me.
2. Emotional comfort.

Several participants (n = 3; 27%) identified that they derived emotional comfort from some of their possessions. For example, Participants 6 and 9 recalled early experiences of deriving comfort from possessions:

Because there was a lot of change and crisis in my 40s, but when it probably did start - although it wasn’t critical - but in my teenage years when my parents went off - mother went off to work and my father started arguing with me and drinking and I didn’t do very well at school and I didn’t have a social life. So I read magazines and collected magazines, but they were a comfort to me and helped me grow up (P6)

I know as a kid I felt unheard, unseen, largely, and at times that was really painful and my private world and objects in it were a sense of comfort. It gave a sense of comfort. Some special - some special things, and look in my early - say when I was five, six, seven, I can't really recall what those things were (P9)

When discussing a childhood experience of not being able to sleep due to being cold, Participant 11 became emotional about her mother not having enough blankets in the house and not going out to buy more blankets. Linked to this experience, she spoke about deriving a sense of physical and emotional comfort from possessions that keep her warm:

Emotional comfort. I know physical comfort definitely, like when it’s winter and I’ve got all these extra spare woolly blankets and my electric blanket and this and that, I just go yeah I really need all this stuff because I need to be warm. Or I’ve got ridiculous amounts of, like if someone comes to visit and it’s like alright, I’ve got all these blankets, we’ll be fine. But I don't know… Security... I need all of this stuff to help me sleep better.

3. Anthropomorphism.

Anthropomorphism emerged as a theme for just one participant. During his interview it was evident that Participant 9 had strong emotional relationships with
some of his possessions, perceiving them as companions and feeling a sense of attachment and responsibility to them:

I've had the thought, but I don't know how early it was, that these objects are - I have a relationship with my friend, they're friendly objects – friendly – they’re not just objects, they’re friends. Yeah, they’re friends. They’re not friendly objects, they’re friends. So there’s a sort of sense of warmth in possessing them, yeah, and caring for them.

I’m actually very anxious in the last couple of days and today particularly about two very lovely old cars which are sitting out in the sun at the moment. I had to move them out of a friend’s shed so they’re between… So they’re sitting getting cooked and I feel terrible… because they’ve been damaged by not caring for them. I’m sitting in this comfortable room and they’re out there just cooking.

I think, I think possibly those men - there are so many of us who are really attached to their wheels, are archetypally in a sense, attached to our horse that we co-evolved. Like we did with our dogs, co-evolved, and so there’s a very special relationship and I think that the car is some aspect, there’s a substitute there and then a very close psychological relationship…So in a sense this is only a hypothesis. I mean they come from real thoughts and thoughts which are - seem to have a truth in them, but really I’m simply trying to make sense of my attachments.

Although some participants had emotional attachments to their possessions, most participants (n = 8; 73%) did not believe that their possessions served a purpose when they were upset, and did not use particular items or objects to soothe themselves when feeling emotional in the present day. For example:

No. No, I don’t think they do [serve a purpose] (P10)

Isn't it funny? When I'm upset I don't even look at them really. I very rarely acknowledge the stuff I've got, it's just there. It's more that I value it when I'm trying to sort things really (P1)
I probably don’t even notice them if I’m upset... Well, you know, if I’m upset about something in particular, I don’t know that they’re any great comfort (P5)

The participants who acknowledged that their possessions may have served a purpose when they were upset could not elaborate or describe this in much detail. Rather, there appeared to be a sense that it was ‘nice’ to have possessions that could be utilised to lift mood (e.g., having nice clothes and jewellery to put on).

In sum, the aim of the third research question was to explore whether ER might be implicated in participants’ hoarding behaviour. Figure 6 displays a pictorial representation of the main findings in relation to this research question.

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<th>Emotional Factors Related to Hoarding</th>
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*Figure 6. Summary of findings on the emotional factors and regulatory functions of aspects of hoarding for individuals with hoarding difficulties*
Observations and Challenges

In addition to participants’ narratives on their emotional experiences, some observations of participants’ behaviour were made during the interview process. For example, several participants were observed to increase their rate of speech and digress into irrelevant detail when they became emotional (i.e., tearful) during the interview. Other behavioural observations included one participant’s hair twirling and another participant’s involuntary eye twitching while discussing emotional content. These observations appeared to be indicative of discomfort with the emotional experience and may represent a form of EA. In contrast, another participant became very emotional and tearful when discussing his past relationships and divorce, yet was observed to effectively regulate this in the room by closing his eyes and breathing deeply. After he settled himself he reported that he was sitting with the wave of emotion and riding it out, and that he was aware that he was feeling something (motioning to his solar plexus) before the wave of emotion overcame him. At the end of the interview he reported that he found it “quite healing” and “affirming” to have had the emotional experience and stated that although he did not know the interviewer, he felt comfortable and had “no shame around feelings those emotions” during the interview. After the interview this participant took some time in the room on his own to ‘collect himself’ and appeared fresh faced, brighter, and settled afterwards. As such, this participant appeared to demonstrate an awareness of his emotions, an acceptance of and willingness to tolerate his emotional experience, and the ability to soothe himself through effective ER techniques in the moment. Such observations are consistent with the qualitative findings in that there was a range of individual differences across the sample with respect to emotional awareness and ER ability.

Observationally, participants tended to demonstrate the most emotionality in the interview when discussing content related to interpersonal difficulties and past losses. When asked about their experience of the interview process itself, participants reported a positive experience, with some describing it as validating or healing. Interestingly, some participants reported learning or recognising something through the interview process, yet externalised the revelation to the interviewer rather than themselves. For example “maybe you found a pattern that I can’t, can’t express sad feelings very well, maybe there’s a reason for that”. Similarly, “like you said, I haven’t developed effective mechanisms to gain positive experiences”.
The most challenging aspect of the interview process was obtaining depth in the participants’ descriptions and accessing emotional content for some participants. Often participants responded to emotional inquiries with one-word answers or short sentences, or alternatively gave a high level of irrelevant detail, which required repeated probing and efforts to redirect. It should be noted that an original version of the interview guide included a section on a critical emotional incident which aimed to obtain a brief description of the emotional incident, and a fine-grained account of what the participant was feeling, how they attempted to manage their emotional experience step-by-step, what effect that attempt had on their emotions, and how long it took for their emotions to subside. However, this had to be reworked as it was difficult to move beyond obtaining a brief description of the emotional incident, as participants tended to want to give a large amount of detail about the event. For some participants, describing the emotional experience appeared to reactivate the emotional feelings associated with the original event (e.g., anger, sadness), making it difficult for them to reflect and report on how they regulated their emotions at the time. This may suggest that these past experiences had not been adequately emotionally processed. For the purposes of this study, the interview guide was modified to be more general so that the session did not become a quasi-therapy session. However, this reveals some of the challenges with interviewing this population in relation to their emotional experiences.

**Discussion**

The current study aimed to explore how individuals with clinically significant hoarding symptoms experience and regulate their emotions, and how ER may be implicated in aspects of their hoarding behaviour. This investigation offered an alternative approach to exploring ER difficulties among individuals with HD by seeking a richer understanding of individuals’ personal experiences and perceptions. As such, the current study extends the findings of the previous two questionnaire-based studies, and contributes to the emerging body of literature on the role of ER in hoarding. Furthermore, the findings from this study may have implications for the treatment of HD, along with directions for future research in this area. This discussion section commences with a discussion of the qualitative and quantitative findings of the current study in consideration of previous research and theory. Consideration is also given to the consistencies and contrast in findings obtained from the two forms of data collection.
used in the current study (i.e., self-report and interview methods). Subsequently, some of the potential treatment implications arising from the findings of this study are outlined. Finally, the limitations of the current study and recommendations for future research are outlined.

**Discussion of Qualitative Findings**

The qualitative findings of the current study revealed a nuanced picture with a range of individual differences across the sample in relation to the three research questions. With regard to emotions experienced, the qualitative findings revealed a theme of difficulties in naming emotions. In general, it appeared that participants had more difficulty labelling the positive emotions they tend to experience, compared to negative emotions. This is perhaps unsurprising given that most participants in the sample experienced comorbid depressive psychopathology. While the findings may suggest that participants experience limited positive emotions, it may also be indicative of difficulties with identifying and describing emotions in general. Indeed, although some participants were able to identify and label emotions, a significant subset of the sample appeared to demonstrate elements of alexithymia in that they had difficulty identifying and describing emotions. It was also observed that the ability to label some emotions and identify sources of positive and negative emotions is not equivalent with being able or willing to speak at an emotional level and describe one’s emotional experience in depth. There was indeed a range of ability to speak at an emotional level in this sample. Some participants appeared to be more concrete in their thinking, demonstrating an externally-oriented thinking style and limited ability to reflect on internal or emotional bases for their behaviour. When asked about emotions, these participants tended to provide answers pertaining to thoughts or behaviour, sometimes requiring several probes in an attempt to access emotional content (which may or may not have been successful). This is consistent with research indicating that individuals high on alexithymia have a propensity to use vocabulary of limited complexity, and there is often a lack of vivid descriptions in their emotional dialogue (Meganck et al., 2009).

While this subset of participants appeared to be characterised by alexithymia and a lack of emotional awareness, the challenges associated with obtaining emotional depth from participants could be due to several reasons. Firstly, this could also be a
manifestation of features of the disorder pertaining to information processing and executive functioning deficits (e.g., Blom et al., 2011; Grisham et al., 2007; Tolin & Villavicencio, 2011; Wincze et al., 2007) whereby participants find it hard to attend to the question and remain on track. Indeed, there was a high level of tangentiality for some participants and sometimes repeated efforts to redirect were unsuccessful. This observation appears to be common for clinicians working with hoarding populations and converges with clinical impressions that HD individuals are easily distracted, have difficulty remaining on task, and display tangential speaking styles, even when prompted to remain focused (Timpano, Smith, et al., 2014). Difficulty accessing emotional depth could also be indicative of concrete thinking, low psychological mindedness, or poor insight associated with HD (Frost et al., 2000; H. J. Kim et al., 2001; Tolin, Fitch, et al., 2010). Alternatively, this may reflect a form of EA in the interview setting, in that participants avoided addressing emotional inquiries due to an unwillingness to tolerate the internal experiences elicited by such questions, and perhaps provided a large amount of irrelevant detail that was not emotionally-based. While there may be several factors impacting on participants’ ability to describe their emotional experiences, there was evidence of alexithymia across the qualitative interviews and quantitative data.

The qualitative findings revealed that participants derived positive emotions through interpersonal avenues, interests and hobbies, and their hoarding behaviour. Similarly, participants experienced a range of negative emotions through interpersonal avenues, their hoarding behaviour, and negative self-views associated with their hoarding behaviour. Throughout the participants’ narratives, themes of abandonment and betrayal, and loss and violation emerged when discussing interpersonal difficulties. Indeed, the most prominent emotional reactions evident during the interview emerged during discussions about interpersonal relationships. These findings are consistent with research suggesting that HD individuals experience a range of intense negative emotions which are not limited to hoarding contexts (A. M. Shaw, Timpano, et al., 2015). In relation to hoarding behaviour specifically, the qualitative findings revealed that clutter, the inability to find items, and the inability to have visitors to the home were sources of negative emotions, which is consistent with the criteria for HD pertaining to significant distress or impairment in functioning (APA, 2013). Furthermore, feelings of sadness, shame, and guilt were evident in participants’ self-
views in relation to their hoarding behaviour, which were associated with a need to hide or conceal aspects of the self or the home. These findings are consistent with another qualitative investigation of compulsive hoarding by Kellett et al. (2010), in which individuals with compulsive hoarding reported the negative impact of their hoarding with themes pertaining to a negative impact on the self (including shame and stigma), negative impact on family and friends, and a negative impact on the physical environment (the impact of clutter).

In relation to attitudes about the emotional experience itself, the qualitative findings revealed a theme of negative/critical attitudes, and descriptions pertaining to this theme revealed elements of non-acceptance of emotional responses or negative reactivity for most participants. That is, being emotional seemed to elicit secondary emotions such as anger or frustration either toward the original emotion, or towards the self for feeling emotional. This finding appears to be consistent with the ‘non-acceptance of emotional responses’ facet of emotion dysregulation conceptualised by Gratz and Roemer (2004). Additionally, the finding that some participants held unhelpful beliefs about the acceptability of emotions can be conceptualised as a form of problematic reappraisal (Werner & Gross, 2010). That is, while an initial emotional response is thought to be not so problematic, the reappraisals that individuals make towards their initial emotional reactions can exacerbate and maintain psychological suffering (L. S. Greenberg & Safran, 1990; S. C. Hayes et al., 2006; Mennin et al., 2007). Indeed, beliefs about the acceptability of emotions leads to having emotions about emotions, and when these emotions are negative, individuals may make desperate attempts to diminish this secondary emotional experience (Werner & Gross, 2010). As such, negative attitudes about the emotional experience itself may lead individuals to engage in EA, which only serves to exacerbate and maintain symptoms of psychological distress (S. C. Hayes et al., 2006; S. C. Hayes et al., 1996). The qualitative findings suggest that individuals with hoarding difficulties may hold unhelpful appraisals about their emotions, which is consistent with research demonstrating the hoarding is associated with appraising emotions as more dangerous or threatening (Timpano, Shaw, et al., 2014).

Another theme that emerged with regard to the emotional experience was stoical attitudes. Some participants appeared to have become more stoical over time, identifying a different “self” in the past that was more prone to emotionality or
sensitivity. This may reflect a factor of aging and the formation of stoical beliefs over time in the context of ‘surviving’ past emotional events. Indeed, a sense of pride and accomplishment was evident in the survivor mentality for some participants, and they appear to have made a cognitive or pragmatic decision at some point to ‘just get on with life’. However, it is unclear whether this represents an adaptive response to emotions or a reaction from one extreme (i.e., sensitive) to the other (e.g., stoic), which may represent minimisation or invalidation of the emotional experience. Similarly, it is unclear whether the health beliefs held by some participants are adaptive or not (i.e., choosing to ‘let go’ of emotions because of feared health consequences does not necessarily equate to emotional processing).

The qualitative findings revealed that participants used a range of strategies for regulating negative emotions, which were classified under avoidance-based strategies, cognitive strategies, acceptance-based strategies, and behavioural strategies such as relaxation, recreation, and help-seeking behaviour. The findings suggested that the most commonly used ER strategies for regulating negative emotions were avoidance-based, which included cognitive and behavioural forms of avoidance. Behavioural avoidance strategies included removing oneself from the home environment and ‘doing something else’ or distracting oneself via other tasks. While such strategies may represent direct avoidance of an unpleasant trigger or situation, many of the descriptions appeared to reveal an experientially avoidant function. That is, participants appeared to be unwilling to experience negative emotions and made deliberate attempts to control or escape from these emotions (S. C. Hayes et al., 1996). According to Boulanger et al. (2010), EA can be conceptualized in any behaviour – covert or overt – that serves an avoidant or escape function, and as such, many of the descriptions pertaining to cognitive and behavioural forms of avoidance were indicative of EA. Indeed, across both forms of avoidance, participants used terms such as ‘escape’, ‘avoid’, and ‘push away’ when discussing their ER attempts. The use of expressive suppression appeared to be another avoidance-based strategy used currently or in the past by many participants, which has been conceptualised as serving an EA function (Wolgast et al., 2013). Furthermore, EA does not refer to simply avoiding aversive events, but involves engaging in avoidance or escape behaviour when doing so is ineffective or causes additional suffering (Boulanger et al., 2010), which is consistent with some of the qualitative descriptions about the ineffectiveness of and long-term negative consequences associated with the use of
avoidance-based strategies. The findings of the qualitative study with regard to avoidance-based strategies are consistent with research demonstrating that both EA and behavioural avoidance play a role in HD (Ayers et al., 2014).

In emotion regulatory efforts to bring about positive emotions, participants tended to engage in activities that were a source of positive emotions, or identified that some of the strategies for managing negative emotions could also bring about positive emotions for them. A theme pertaining to a lack of strategies for eliciting positive emotions also emerged, with some participants describing that positive emotions were achieved through the avoidance or absence of negative emotions, as opposed to active efforts to seek out positive emotions and experiences. This may be a result of comorbid depressive symptomology (Frost, Steketee, et al., 2011; Tolin, Stevens, et al., 2012) or may represent a lack of effective strategies for inducing positive emotions.

Many of the strategies identified by the participants can be considered under Gross’ (1998b) process model of ER. For example, watching television may represent a form of attentional deployment, cognitive reappraisal signifies a cognitive change strategy, while avoiding the home environment may be an example of problematic situation selection (i.e., leaving the home before an emotion has been generated) or alternatively, a response modulation strategy (i.e., leaving the home after a negative emotion has been fully activated). The qualitative findings also revealed the use of several other response modulation strategies such as expressive suppression, and the use of substances, food, and relaxation techniques. As such, it appeared that these participants used both adaptive and maladaptive ER strategies at various stages of the emotion-generative process (Gross, 1998b).

Another main finding was that most participants perceived that their ER strategies were ineffective, and several key reasons for this perception emerged from the participants’ narratives. Firstly, some participants were unable to recognise that they used any ER strategies or did not perceive that they made deliberate efforts to regulate their emotions. While other participants appeared to be aware of the ER strategies available to them, they identified that they were not utilising them and therefore considered that they were ineffective at regulating their emotions. Finally, some participants were able to identify that they used ER strategies, yet they judged them to be ineffective in that the effects were only short-lived and did not alleviate the underlying emotional experience. Inherent in these descriptions was the notion that ER
strategies provided superficial relief and were ultimately not effective in regulating emotions. For example, although some participants utilised effective strategies such as exercise, yoga, or mediation, they were disappointed when the effects dissipated. Participants also identified that although their strategy use might be effective in the short-term, these strategies had long-term consequences and ultimately compounded the problem or led back to negative feelings. As such, these findings suggest that participants had an awareness of their unhelpful ER strategies, and perceived that they did not have effective strategies for managing their emotions, which appears to reflect the aspect of emotion dysregulation pertaining to limited access to ER strategies perceived as effective (Gratz & Roemer, 2004). The findings in relation to perceived effectiveness are important given that beliefs about one’s ability to effectively manage emotions may not necessarily equate to actual ability. Likewise, beliefs about the effectiveness of particular strategies are likely to impact on whether those strategies are utilised or not. In general, these findings may be indicative of difficulties in one or more of the areas required for successful ER; a lack of awareness about the differential effectiveness of different strategies, a perception that they have few ER strategies to choose from (which could be accurate or distorted), low ER self-efficacy, or a lack of skill or knowledge about specific strategies (Gross & Jazaieri, 2014).

With regard to whether ER is implicated in hoarding, the qualitative findings again revealed a nuanced picture, with evidence for some aspects of hoarding behaviour having an emotional basis or providing some sort of emotion regulatory function for some participants. Most participants identified emotional factors that were implicated in the onset or exacerbation of their hoarding behaviour, which included themes of material deprivation, loss, and difficult emotional conditions during childhood or adulthood. These findings are largely consistent with previous research on risk factors for hoarding behaviour such as emotional and material deprivation, and traumatic or stressful life events (e.g., Cromer et al., 2007; Grisham et al., 2006; Seedat & Stein, 2002; Tolin, Meunier, et al., 2010). Furthermore, these findings are in line with other qualitative research on individuals with compulsive hoarding which revealed a theme of perceived links between childhood experiences and current hoarding problems (Kellett et al., 2010), and may suggest a developmental basis for emotion dysregulation.

In particular, the qualitative findings revealed that acquiring was utilised by most of the participants as an ER strategy, which provided the dual function of escaping
from negative emotions and inducing positive emotions. For some participants, engaging in acquiring behaviour was a way of regulating emotional distress, such as feelings of depression, sadness, or anxiety. Particularly striking was one participant’s description of using shopping after her psychology sessions as a way of alleviating the anxiety or distress evoked during sessions. Across participants’ narratives it appeared that acquiring behaviour represents a maladaptive strategy for regulating negative emotions, and may reflect a lack of access to other effective ER strategies or a form of EA. Indeed, some elements of acquiring appeared to serve an experientially avoidant function, which is generally consistent with research suggesting that acquiring may represent an avenue through which individuals with HD engage in EA (Ayers et al., 2014). Acquiring also appeared to be utilised as an ER strategy for eliciting positive emotions, which included themes of gratification, opportunity, and positive aspects of self-esteem and identity. The emotion regulatory function of acquiring was further evident given that several participants did not appear to care about the purchases they made, with some identifying that they bought clothes that didn’t fit or left their purchases at the shop. This suggests that the activity of acquiring was more important than the purchasing of items, with participants’ narratives reflecting an effort to obtain positive emotions or escape from negative ones through their acquiring. As such, the qualitative findings support the conceptualization of acquiring as a maladaptive attempt to regulate one’s positive and negative emotions (Tolin, 2011), and are consistent with research suggesting excessive acquisition is motivated by both positive and negative emotional states (e.g., Grisham et al., 2011; Mueller et al., 2009; Steketee & Tolin, 2011; A. D. Williams & Grisham, 2012).

Throughout the qualitative findings, there was evidence that some participants experienced difficulty with regulating their impulses under conditions of negative and positive affect, which is consistent with previous research (Phung et al., 2015; Timpano, Rasmussen, et al., 2013). For example, positive urgency was evident in some descriptions of physical and emotional gratification associated with acquiring behaviour. Indeed, some participants used the term ‘frenzy’ in relation to acquiring behaviour, indicating a loss of control over behaviour when experiencing positive emotions. Negative urgency may be reflected in some participants’ descriptions of engaging in ‘out of control’ acquiring behaviour in response to an emotional trigger or as a way of escaping negative emotions. However, although participants presumably
experienced strong urges in relation to acquiring, the majority of participants did not
self-identify as experiencing impulse control difficulties and did not self-disclose
impulse control difficulties in relation to their hoarding behaviour. There was a lack of
depth in participants’ responses to questions about impulse control, with participants
tending to respond in the negative, or alternatively, with responses about angry
outbursts, or alcohol or substance use. Indeed, three participants appeared to have
difficulties controlling impulsive behaviour with regard to the consumption of alcohol
or substances, with two of the three meeting diagnostic criteria for alcohol dependence.
As such, although there was some evidence of impulse control difficulties for some
participants, direct questions about impulse control did not yield prominent themes
across the narratives.

Similarly, inquiries about discarding behaviour did not reveal prominent themes
pertaining to an ER function of saving behaviour. One reason for not obtaining a lot of
depth about the emotional impact of discarding and the need to save possessions to
regulate distress may due to the nature of the sample population. The participants were
help-seeking individuals who had already commenced a treatment program and
therefore, had presumably learnt some skills and were already engaging in discarding
behaviour. While the narratives did not reveal descriptions of strong attachment or
feelings of loss in the context of discarding, inquiries about the meaning of possessions
revealed several themes which appear to be relevant to ER.

The qualitative findings revealed that some participants derived a sense of
security and emotional comfort from their possessions, which is consistent with
literature suggesting that feelings of comfort and safety are implicated in emotional
attachment to possessions (Steketee & Frost, 2003; Hartl et al., 2005). This sense of
security and emotional comfort appeared to have its origins in past childhood
experiences, and was associated with feelings of fear of deprivation or loss. Indeed,
there was some overlap between the themes pertaining to the role of possessions and the
findings on emotional factors, suggesting that possessions may serve an ER function
linked to developmental experiences. In addition, one participant described a strong
emotional attachment to his possessions, whereby he made attributions of friendship
and human-like qualities to his possessions and felt a great deal of responsibility for
taking care of them. This is consistent with previous research suggesting that the
tendency to anthropomorphise contributes to strong emotional attachments (Frost et al.,
1995; Frost et al., 2012; Timpano & Shaw, 2013), and is similar to another qualitative investigation which found a theme of a strong emotional relationship to possessions, with sub-themes of anthropomorphizing objects and a sense of fusion between the hoarding individual and their possessions (Kellett et al., 2010). As such, there was evidence of emotional attachment to possessions and/or emotional reasons for retaining possessions across the current sample. However, the majority of participants did not rely on their possessions in order to soothe or comfort themselves when they were feeling emotional, suggesting that possessions were not used as a substitute ER strategy. Indeed, there was an absence of descriptions of possessions being used for an ER purpose in this sample, which is in contrast to anecdotal descriptions reported in the literature such as objects being “removed from emotional life – soothing”, and individuals “gathering treasures around me” to alleviate negative emotions (Frost & Steketee, 2010).

It is possible that some of these qualitative findings could be conceptualised as cognitions or justifications for why the participants hoard, rather than indicating an emotional basis for behaviour. For example, Participant 9 identified a strong sense of responsibility for his possessions (i.e., cars), which is indicative of responsibility beliefs. However, his descriptions did not simply reflect cognitions about responsibility, as his emotional distress around this and his emotional connection to his possessions was strongly sensed during the interview. Similarly, some participants believed that their hoarding represented creativity or cleverness and was associated with generosity in the context of gift-giving, which could represent a cognitive justification for continuing the behaviour. However, emotional components related to self-worth and self-identity were evident when participants were describing their experiences.

It should be acknowledged that participants also cited non-emotional reasons for their hoarding behaviour and their inability to change their behaviour. Examples included their age, lack of time, lack of energy, genetic factors, environmental triggers, moving house, and inheriting other people’s possessions. As the focus of this study was on emotional bases of behaviour these factors were not further explored. However, there are clearly multiple factors that influence hoarding behaviour, and the identification of some of these non-emotional factors in the context of emotional inquiries may suggest that there are different dimensions of hoarding. For example, some individuals may have a strong familial link, experience greater information processing deficits, and may...
be more likely to cite non-emotional reasons for their hoarding behaviour, while others might be able to identify an emotional basis or trigger for their behaviour and may form stronger emotional attachments to their possessions. Alternatively, this distinction may be a product of ‘concrete thinkers’ versus more ‘psychologically-minded’ individuals. While it was difficult to make a distinction in the current sample, it appears that some aspects of hoarding behaviour served an emotion regulatory function for some individuals.

In summary, while the qualitative findings revealed a complex and nuanced picture of ER, there appeared to be evidence across the interviews for various elements of emotion dysregulation. In particular, there was evidence for difficulties with identifying and describing feelings; unhelpful attitudes towards the emotional experience including non-acceptance of emotional responses; the use of avoidance-based ER strategies which serve an experientially avoidant function; and a perceived lack of effective strategies for regulating emotions. In addition, several participants noted a lack of strategies for achieving positive emotions. Furthermore, emotional factors appeared to be implicated the onset and/or exacerbation of hoarding behaviour, and aspects of hoarding appeared to be utilised as a form of ER, most prominently with regard to acquiring behaviour and emotional attachment to possessions. However, generally the sample did not rely on possessions as a form of ER. These qualitative findings revealed that various aspects of emotion dysregulation were pertinent to this clinical hoarding sample, and are subsequently considered in light of the quantitative results and treatment implications.

Discussion of Quantitative Findings

The mixed-methods design of the current study allowed for a comparison between a clinical and non-clinical sample of similarly aged participants on self-report measures. As expected, the clinical hoarding group scored significantly higher than the non-clinical sample from Study 2 on measures of hoarding severity, saving cognitions, depression, and OCD symptoms. While the clinical sample also scored higher than the non-clinical sample on non-hoarding obsessive-compulsive symptoms, this difference was not statistically significant. With regard to measures of ER, the results demonstrated that, compared to similarly aged non-clinical participants, the clinical sample had significantly higher levels of EA, greater overall alexithymia, and greater
difficulty with identifying feelings. The difference between groups on the difficulty describing feelings facet of alexithymia also approached statistical significance.

While based on a small sample size, these results are consistent with previous research showing that individuals with HD have significantly higher levels of EA than healthy controls (Fernández de la Cruz et al., 2013). Furthermore, the mean score on EA for the clinical sample was in the range of values indicative of psychological distress (Bond et al., 2011), and is consistent with reported means in other hoarding samples using the same measure (e.g., Wheaton et al., 2013). The mean score for alexithymia for the clinical sample fell in the range of ‘borderline/possible alexithymia’ (Connelly & Denney, 2007; G. J. Taylor et al., 1997) and the total and subscales mean scores were slightly higher than those reported for adult outpatients with OCD (De Berardis et al., 2005). However, the finding that clinical participants scored significantly higher on alexithymia than non-clinical participants is in contrast to previous research by Grisham et al. (2008) which found that individuals with compulsive hoarding did not differ from community participants or non-hoarding anxious or depressed individuals on a construct related to alexithymia (i.e., emotional intelligence). As noted previously, these differences may be accounted for by the use of a different, multifaceted measure of alexithymia in the current study, and differences in sample size.

These quantitative results suggest that EA and alexithymia may be particularly relevant to hoarding, which is consistent with the quantitative results from Study 2 and with some of the themes that emerged in the qualitative findings. For example, as noted above, an experientially avoidant function was evident in the use of various avoidance-based strategies identified by participants. Furthermore, the finding that a subset of participants appeared to experience difficulty identifying and describing their emotions and demonstrated an inability or unwillingness to speak at an emotional level is consistent with the findings from Study 2 which found hoarding to be associated with EA and difficulty identifying feelings, and that the alexithymia-hoarding relationship was mediated by EA. In fact, given the findings from Study 2, one would expect that HD participants would have trouble identifying, describing, and tolerating their emotions. Given the challenges associated with obtaining emotional depth and rich descriptions from participants, it is somewhat surprising that the sample mean on self-reported alexithymia was indicative of only possible/borderline alexithymia. However, this may reflect an issue with measuring abilities through self-report instruments, or
may be due to the range of individual differences across the sample. Indeed, there was a range of presentations in this sample, with some individuals demonstrating psychological mindedness or introspection, while others appeared to be more concrete or externally-oriented in their thinking style.

While the clinical hoarding group from Study 3 scored higher than similarly aged participants from Study 2 on measures of emotion dysregulation, negative urgency, and positive urgency, these differences did not reach statistical significance. This is somewhat surprising given previous research that has found individuals with HD to have significantly higher scores on the DERS compared to healthy controls (Fernández de la Cruz et al., 2013). However, the current sample’s mean scores were consistent with those reported by Fernández de la Cruz et al., 2013, and consistent with some of the themes that emerged in the qualitative analysis. For example, non-acceptance of emotional responses was evident in the theme of negative attitudes towards the emotional experience, while limited access to effective strategies was evident in participants’ descriptions about their ER efforts. Similarly, a lack of emotional awareness and/or clarity is conceptually similar to alexithymia, and was evident throughout the interview process. Interestingly, the clinical sample did not significantly differ from the non-clinical sample on self-reported impulsivity. Furthermore, the mean scores for negative urgency were lower than those reported for other clinical (A. D. Williams & Grisham, 2012) and non-clinical samples (Phung et al., 2015), and the scores for positive urgency were lower than those reported for compulsive buyers and healthy controls (A. D. Williams & Grisham, 2012). These findings were in contrast to expectation, given the results of the previous two quantitative studies and previous research demonstrating associations between increased self-reported impulsivity and hoarding (Fitch & Cougle, 2013; Hezel & Hooley, 2014; Phung et al., 2015; Timpano, Rasmussen, et al., 2013). However, the self-reported scores of the hoarding sample appear to be consistent with the qualitative findings, which revealed that participants did not perceive that they have difficulties with impulse control.

In contrast to expectation, the clinical hoarding group was not significantly different from the non-clinical group on the use of ER strategies. In consideration of previous research, the current sample had a higher mean score for cognitive reappraisal and a lower mean score for expressive suppression than pathological gamblers and
clinical controls (A. D. Williams et al., 2012). It is unclear why this pattern was found, and any postulations are speculative given the small sample size of the current sample. While the quantitative results suggested that the use of cognitive reappraisal and expressive suppression were not particularly important or problematic for this sample (which is consistent with the findings of Study 2 which found that the two strategies were not significantly associated with hoarding symptoms), the qualitative findings did reveal some descriptions pertaining to the use of both strategies. That is, the current or past use of expressive suppression was evident for many participants, while the use of cognitive reappraisal was described by a few participants. This raises a larger question about the interpretation of, and responding to, self-report measures, and the inconsistencies between self-report and interview formats.

The use of both self-report and interview methods in this study provided a more comprehensive account of ER in this clinical sample and allowed for comparisons to be made between the two forms of data collection. While the findings between the quantitative measures and qualitative findings were broadly consistent, there were some inconsistencies noted within participants’ responding across their self-report measures and interviews. For example, one participant had a wide range of vocabulary for emotions gained through previous studies. However, her quantitative score on the TAS-20 was in the range for alexithymia, and observationally it was difficult to obtain emotional depth from her descriptions during her interview. This may suggest that an ability to name emotions had been developed through her studies, but not necessarily integrated with her own internal experiences and ability to recognise and label her own emotional experiences. Another participant reported a high level of EA on his self-report measure, which was consistent with his descriptions of a strong resistance to, and non-acceptance of, his feelings of anxiety. However, he described an ability to sit with other emotions such as grief and loneliness, and demonstrated a willingness to attend to emotions that arose in session, which was inconsistent with his high EA score. This illustrates the discrepancy between reporting one’s perception of one’s general ability on a questionnaire, versus one’s actual ability depending on contextual factors such as the particular emotion experienced, and the setting in which the emotion arises. Furthermore, this highlights the importance of obtaining a narrative, developing individual case formulations, and emphasizes one of the strengths of the qualitative approach to research. As an illustration of this point, one participant specifically
identified that her perception of her abilities changed throughout the interview process. This participant answered the self-report measures prior to the interview believing that she was aware of her emotions, but then came to a different perception of her abilities during the interview process, and even queried whether she should change her answers on the self-report measures after the interview. She stated:

The other thing was that when I started these questionnaires that had questions about emotions and stuff - how well do you think you are at controlling emotions? How well do you think you understand your emotions? How well are you aware of your emotions? I'm like yes, I'm aware of my emotions. Yes, no worries. No, no, no, no, I know when I'm feeling angry. I know when I'm feeling bored or depressed or da, da, da, da, da, da. Then you start asking me all these questions and I just go holy shit, I don’t know anything. I’m not in touch with any of this stuff.

These findings illustrate some of the limitations of self-report measures, and highlight the importance of qualitative studies and of obtaining an understanding of each individual’s particular difficulties.

**Treatment Implications**

This qualitative study reveals that individuals with clinically significant hoarding problems appear to exhibit features of emotion dysregulation, and that some aspects of hoarding behaviour may serve an ER function. As such, the findings from the current study may have implications for the treatment of HD. Firstly, given that elements of alexithymia were evident in both the qualitative and quantitative results, and the findings demonstrated a range of individual differences with regard to ER ability, an assessment of emotional vocabulary and competence could be useful for individual case formulations and informing treatment. Furthermore, there may be a need for general psychoeducation on emotions and skills training prior to treatment, which could draw upon interventions such as the ER skills training module of DBT (Linehan, 1993). Such interventions could improve individuals’ ability to identify and describe emotions, which may also assist with reducing EA. That is, increasing one’s ability to recognise what emotions one is experiencing is likely to increase one’s ability to tolerate those emotions and to engage in exposure tasks and homework practice.
Furthermore, increasing one’s ability to understand and recognise emotions is fundamental for effective management of those emotions, and will facilitate the use of effective ER strategies rather than the individual relying on avoidance-based strategies. Indeed, the revelation that one participant used shopping as an ER strategy directly after her psychology sessions suggests that basic DT skills and ER training may be necessary in order to cope with the treatment process itself. Otherwise, for some individuals, treatment may inadvertently reinforce the use of avoidance-based ER strategies. As such, ER skills training and/or acceptance-based interventions (e.g., mindfulness training) might be useful for reducing EA and increasing DT.

Given that the qualitative findings revealed that most participants held unhelpful attitudes towards the emotional experience and appeared to be non-accepting of their emotional responses, this may be an important area for intervention in HD, particularly because beliefs about the acceptability of emotions can exacerbate emotions and give rise to maladaptive strategies for regulating such emotions (Werner & Gross, 2010). Psychoeducation about emotions and acceptance-based interventions may therefore be useful for addressing the non-acceptance of, and unhelpful attitudes towards, emotions.

As most participants did not believe that they had effective ER strategies, skills training in ER strategies may increase ER self-efficacy and also help address perceptions about inadequate strategies (which may be distorted). Skills training could increase individuals’ repertoires of ER strategies and provide psychoeducation on when and where such strategies might be useful. This could include psychoeducation on the effectiveness of short-term strategies for reducing distress (e.g., adaptive use of distraction) along with how such strategies can become problematic when habitually used to avoid emotions. Furthermore, it may be important to make the distinction between regulating transient emotions and managing underlying mood difficulties (e.g., depression) through longer-term management plans. This may assist with challenging the perception that strategies are ineffective because they do not ‘fix’ underlying mood states. Such interventions would also reinforce the view that ER strategies can be adaptive or maladaptive depending on the context (Aldao & Nolen-Hoeksema, 2012; Gross, 2014).

In addition to skills training for increasing ER strategies for regulating negative emotions, interventions aimed at expanding the repertoire of strategies for invoking positive emotions are likely to be helpful. Indeed, some participants identified a limited
ability to bring about positive emotions, which may represent a skills deficit or may be a result of comorbid depression. Regardless, individuals who have limited ways of improving mood may be more likely to use acquiring and rely on positive aspects of self-esteem derived through acquiring as a way of invoking positive emotions. Over time this regulation strategy may have become overused, perpetuating and exacerbating their hoarding difficulties. While participants were recruited from a group program that included activity scheduling to improve mood, and aimed to promote self-acceptance by emphasising being kind to oneself and treating oneself positively though worthwhile activities (Moulding, Nedeljkovic, et al., 2016), perhaps additional interventions or training in this area is required.

In sum, the findings from the current study may provide support for the inclusion of ER interventions within established CBT treatments. Given that the most intense emotional reactions in the interviews tended to be related to interpersonal difficulties, such ER interventions are likely to be helpful beyond hoarding-related emotional experiences. Furthermore, as the qualitative findings revealed that many factors are likely to be involved in the emotional bases of hoarding behaviour (e.g., developmental factors, trauma, and loss) psychodynamic and/or schema-based therapies may be applicable to the treatment of HD, and may also increase emotional awareness.

**Limitations and Future Research**

The findings from the current study should be considered in light of several limitations. Firstly, these findings cannot be generalized to the wider HD population due to the qualitative nature of the study and the sample characteristics. However, while the sample was small, this is consistent with the guidelines on sample size for IPA (Brocki & Wearden, 2006). The current sample appears to have a relatively higher rate of previous and current married status than would be expected based on previous research (Frost & Gross, 1993; H. J. Kim et al., 2001; Nordsletten et al., 2013; Pertusa et al., 2008; Timpano, et al., 2011; Torres et al., 2012), and therefore may not represent the wider HD population. It is also acknowledged that the participants were purposively sampled from a treatment program and volunteered for participation in this study, and therefore, may have been particularly motivated to discuss their emotional experiences and hoarding behaviour. Given research showing that the majority of participants who volunteer for research studies appear to have reasonably good or fair insight (Mataix-
Cols et al., 2013; Tolin, Frost, Steketee, & Fitch, 2008), this could suggest that these participants had a higher level of emotional insight than non-treatment seeking populations. However, as noted, the findings did reveal a range of individual differences with regard to emotional awareness and psychological mindedness. In addition, it is acknowledged that participating in a group treatment program is likely to have improved the participants’ level of emotional awareness and ER skills. As data on treatment outcome was not available for the current study, conclusions cannot be drawn about the impact of treatment. Future research is recommended to investigate changes in ER abilities following treatment.

Conclusions about casual pathways between ER and HD cannot be made from the current study, and it is unclear whether the ER difficulties identified and observed in this sample are the result of comorbid disorders such as depression and anxiety. While findings from the previous two studies suggest that ER difficulties were associated with hoarding above-and-beyond symptoms of depression, the current study cannot determine whether the ER difficulties experienced by these participants are related to hoarding or comorbid psychopathology. However, typical individuals with HD will experience similar levels of comorbidity. Furthermore, it is unclear whether hoarding behaviours are the consequence of underlying ER difficulties or whether they function as ER strategies in their own right (or both), and ultimately these questions cannot be answered by the current findings. Hoarding behaviours may be part of a cluster of maladaptive ER strategies used by individuals with compulsive hoarding, and the findings of the current study seem to reflect this. Finally, it is unclear whether the strategies described by the participants reflect ER efforts as opposed to coping strategies. While the concepts of ER, coping, and mood regulation overlap, the qualitative findings were conceptualised within an ER framework and a distinction between these concepts was outside the scope of this project. The definition of ER distinguishes between the modulation of emotions, and attempts to avoid or extinguish negative emotions altogether (Gratz & Roemer, 2004). The qualitative findings showed limited descriptions pertaining to the former and tend to provide stronger evidence for the latter, however further research in this area is required.

There are also several potential methodological limitations that need to be acknowledged. Firstly, while the aim of the qualitative investigation was to obtain rich data and an in-depth understanding of participants’ experiences, the data obtained was
largely descriptive, limiting the depth and complexity of the themes generated, and should be interpreted in light of the challenges encountered with interviewing this sample. Given the difficulty experienced by the interviewer in gaining depth in participants’ descriptions of their emotional experiences, the questioning style needed to be modified for some participants in order to obtain relevant data. As such, there is a possibility that some of the probes, examples provided, or follow-up questions may have become more directive over time and may have influenced some of the participants’ responses. However, it was conveyed to participants that the interviewer was interested in their experience which may or may not be similar to the experiences of others, and participants did not appear to be acquiescing to questions as they were able to provide further detail on their experiences. Furthermore, an IPA approach acknowledges the role of the researcher in making sense of the participants’ experiences and uses the interview schedule as a guide rather than a rule (J. A. Smith et al., 2009). Identification of researcher bias and close supervision were also part of the validation process. However, the co-coding of themes with additional raters was not completed in the current study, and is an important aspect of consideration for future research. For this population it may have been helpful to do a follow-up interview with each participant, as the first interview may have stimulated further thinking about these concepts and provided additional data for analysis. It was anticipated that through the recruitment phase, consent information statement, and completing the questionnaires prior to the interview, participants would have started reflecting on and thinking about their emotions. However, given that the interview process itself revealed some inconsistencies in responding across methods for some participants, and given the difficulties experienced in obtaining in-depth responses in the area of emotions and ER, future research may require follow-up interviews.

In summary, this pilot qualitative investigation found some broad trends in relation to how individuals with HD experience and regulate their emotions, and whether aspects of hoarding serve an ER function. The qualitative findings revealed a nuanced picture, with some evidence for ER difficulties, with regard to difficulties identifying and describing feelings, EA, unhelpful attitudes towards the emotional experience, and a perceived lack of effective ER strategies. Additionally, aspects of hoarding behaviour (i.e., acquiring and emotional attachment to possessions) appeared to serve an ER function for some participants. However, as this study represents an
initial pilot investigation, further research is needed to extend upon these findings. Future qualitative research could further investigate some of these relevant areas in more depth, in consideration of the challenges noted with interviewing this population. As suggested, follow-up interviews may be necessary, or alternative methods may be utilised. While the attempt to obtain a step-by-step example of regulating a past emotional experience was unsuccessful with this sample, future research could attempt this in an alternative format or utilise alternative methods for assessing actual ER abilities. Given that research demonstrates that HD is associated with impulse control difficulties, and yet this sample did not self-identify impulse control difficulties, further investigation into participants’ experiences of this is also warranted. Collectively, the three studies of the current project indicate that various aspects of ER are implicated in compulsive hoarding. The following chapter involves an overview of the main findings of the current research project, along with a discussion of the theoretical and clinical implications and limitations of the current project, and recommendations for future research.
Chapter 9: General Discussion

The current research project aimed to investigate the role of ER in compulsive hoarding through three independent studies. Firstly, an online questionnaire-based study was conducted with a non-clinical sample as a pilot exploration of ER difficulties and emotion-based impulsivity in relation to hoarding phenomena. In addition, a prominent component of the CBT model of hoarding (i.e., beliefs about possessions) was examined in the relationship between ER difficulties and hoarding symptoms. A second online questionnaire-based study aimed to replicate the findings from Study 1 in an independent non-clinical sample, and explored the relationships between hoarding phenomena and additional ER constructs (i.e., alexithymia, EA, and the use of expressive suppression and cognitive reappraisal strategies). In a further exploration of the role of ER in compulsive hoarding, Study 3 was designed as a pilot investigation of ER in a clinical hoarding sample and was predominantly qualitative in nature. This discussion includes an overview of the main findings of the current research project, followed by a discussion of the theoretical and clinical implications of these findings. The methodological and theoretical limitations of the current project are then described, and directions for future research in the area of ER and compulsive hoarding are proposed.

Overview of Project Findings

The current project established that general ER difficulties were related to hoarding symptoms and hoarding beliefs, and that the relationship between general ER difficulties and hoarding was mediated by emotional attachment beliefs. These findings were replicated in two independent non-clinical samples, and are consistent with previous research demonstrating associations between ER difficulties and hoarding symptoms (Raines et al., 2015). Furthermore, these results are consistent with some of the findings of the qualitative study, whereby ER difficulties were evident in the experiences of individuals with clinically significant hoarding symptoms. Themes emerged across the participants’ narratives pertaining to unhelpful attitudes towards the emotional experience including non-acceptance of emotional responses, and a perceived lack of effective strategies for regulating emotions, which reflects aspects of the multidimensional model of ER and dysregulation (Gratz & Roemer, 2004).
Support was also found for the role of negative and positive urgency in the current project, with both facets of emotion-based impulsivity being independently associated with hoarding symptoms and hoarding beliefs across two independent non-clinical studies. These findings are consistent with previous research demonstrating associations between negative urgency and hoarding (Phung et al., 2015; Timpano, Rasmussen, et al., 2013), and between positive urgency and other compulsive behaviours such as compulsive buying (Rose & Segrist, 2014; A. D. Williams & Grisham, 2012) and gambling (Cyders & Smith, 2008a; Cyders et al., 2007). Across the two independent non-clinical studies of the current project, negative urgency was found to play a more prominent role than positive urgency in the prediction of hoarding symptoms. While difficulties regulating impulses under conditions of negative and positive affect were apparent in the descriptions of some of the participants from Study 3 (primarily with regard to acquiring behaviour), urgency did not emerge as a prominent theme in the qualitative analysis and clinical participants did not self-identify as having impulse control difficulties.

The current project established that EA was related to hoarding symptoms and hoarding beliefs in a non-clinical sample, and that clinical participants scored significantly higher on a measure of EA compared to similarly-aged non-clinical participants. These findings are consistent with previous research demonstrating associations between EA and hoarding in clinical and non-clinical samples (Ayers et al., 2014; Wheaton et al., 2011), and previous research showing that individuals with HD have significantly higher levels of EA than healthy controls (Fernández de la Cruz et al., 2013). Experiential avoidance was also evident in the experiences of individuals with clinically significant hoarding problems. That is, Study 3 participants identified using a range of avoidance-based strategies which appeared to serve an experientially avoidant function, such as cognitive avoidance, behavioural avoidance, expressive suppression, and acquiring behaviour. Furthermore, some participants may have engaged in EA during the interview process itself when emotional content was raised.

Evidence for the relationship between alexithymia and hoarding behaviour and hoarding beliefs was also established in the current project, with results from Study 2 suggesting that the difficulty identifying feelings facet of alexithymia may be most relevant to HD. In addition, individuals with compulsive hoarding in the current study scored significantly higher on overall alexithymia and the domain of difficulties
identifying feelings than did similarly-aged non-clinical individuals. While this is the first investigation of alexithymia in relation to hoarding behaviours, the findings are in line with other related research that has found relationships between difficulty identifying feelings and compulsive buying (Rose & Segrist, 2012) and associations between alexithymia and the hoarding subscale of an OCD measure (Pozza et al., 2015; Stern et al., 2014). In addition, the current research project found that the alexithymia-hoarding relationship was mediated by EA, suggesting that difficulties with identifying feelings impacts on one’s willingness to experience emotions, which impacts on hoarding symptoms. This is aligned with previous research demonstrating that constructs of emotional avoidance and intolerance mediate the relationship between alexithymia and psychological conditions (Panayiotou et al., 2015; Rose & Segrist, 2012). While the difficulty identifying feelings facet of alexithymia appeared to be the most prominent in relation to hoarding in the current project, evidence for multiple aspects of alexithymia was reflected in the experiences of individuals with compulsive hoarding. That is, some participants appeared to have difficulties with identifying and describing their emotions, and demonstrated an inability or unwillingness to speak at an emotional level during the interview process. While there was a range of ability in the sample, some participants appeared to be more externally-oriented in their thinking style and it was difficult to access emotional depth and rich descriptions during their interviews. The observation that some participants had difficulty talking at an emotional level and tended to respond to emotional inquiries with irrelevant detail may be due to alexithymia, and such deficits in identifying and labelling emotions may have given rise to EA in the interview setting.

In contrast to expectation, the current project did not establish significant relationships between hoarding symptoms and the use of cognitive reappraisal and expressive suppression ER strategies. Likewise, the self-reported results for the clinical sample indicated that the use of these strategies were not particularly important or problematic. However, the qualitative findings did reveal that many participants engaged in expressive suppression, whereby putting on a strong persona served a protective function for the self and others, and a few participants described using cognitive reappraisal strategies. More generally, the findings of Study 3 suggested that the clinical sample utilised a range of ER strategies, most commonly avoidance-based strategies, and other identified ER strategies included cognitive, acceptance-based, and
behavioural strategies. The findings suggested that individuals from the clinical sample utilised both adaptive and maladaptive ER strategies at various points of the emotion-generative process (Gross, 1998b). Notably, most clinical participants did not perceive that they had effective ER strategies. According to Gratz and Roemer (2004), the subjective appraisal of one’s ability to effectively regulate emotional distress may be more relevant to symptoms than the use of specific ER strategies. As such, it is possible that perceptions about one’s ability to effectively regulate emotions are more important in hoarding than the use of specific strategies such as expressive suppression and cognitive reappraisal.

Collectively, the findings of the three studies of the current research project suggest that certain aspects of ER are implicated in hoarding. In particular, support was established for the role of emotion dysregulation, EA, and alexithymia across quantitative and qualitative studies. Support was also found for the role of negative and positive urgency in the quantitative studies, although urgency did not emerge as a prominent theme in the qualitative study. Acquiring behaviour and possessions appeared to serve an ER function in the qualitative study, which is broadly consistent with the findings of the quantitative studies which found facets of ER to be associated with acquisition and difficulty discarding. Furthermore, beliefs about emotional attachment to possessions were found to mediate the ER-hoarding relationship in both quantitative studies, which is broadly consistent with the findings from the qualitative study where emotional attachment to possessions appeared to serve an ER function for some participants (such as a sense of security, emotional comfort, and friendship). However, the majority of clinical participants did not rely on their possessions as a form of ER. As such, the current research project makes several novel contributions to the emerging body of literature on ER and HD, and may have implications for the CBT model and treatment of the disorder.

**Theoretical Implications**

The findings of the current research project contribute to the emerging body of the literature on the role of dysfunctional emotional processing and regulation in hoarding. Firstly, this research suggests that general ER deficits are related to a prominent component of the CBT model known to contribute to symptoms (i.e., cognitions). Such underlying ER deficits may arise from vulnerability factors for the
disorder (e.g., negative early developmental experiences and information processing deficits) and may influence the development of maladaptive beliefs about possessions, which over time give rise to clinically significant hoarding symptoms. While causal pathways cannot be determined from the current project (and it is possible that distorted cognitions lead to ER difficulties), theoretical models of HD may warrant consideration of ER difficulties, particularly as cognitions do not fully account for the presence of symptoms. Although the current CBT model includes a component of emotional reactions which are thought to arise from cognitions and influence hoarding behaviour, fundamental difficulties with understanding and regulating emotions are likely to influence these relationships. As such, ER may represent another factor that could potentially be incorporated into the existing CBT model of HD.

In addition, many of the findings from the current project support a theoretical link between ER and hoarding behaviour. For example, acquiring and saving behaviours appear, in some part, to represent attempts to regulate emotions, a form of EA, and difficulties with negative and positive urgency. Similarly, these behaviours appear to reflect aspects of general emotion dysregulation such as non-acceptance of emotional responses and/or a lack of access to effective ER strategies. These aspects of ER difficulties are consistent with the existing CBT model of HD which conceptualizes acquiring and saving behaviours as avoidance-based behaviours that are performed to avoid internal distress related to negative thoughts and emotions (Frost & Hartl, 1996; Steketee & Frost, 2003, 2014b). Furthermore, the findings are consistent with conceptualizations of acquiring as a maladaptive attempt to regulate one’s positive and negative emotions (Tolin, 2011), and are indicative of difficulties with controlling impulses and urges under conditions of positive and negative affect. Therefore, these findings are also theoretically aligned with an addictions framework of hoarding behaviour which implicates self-regulation deficits and the anticipation of pleasure as well as the reduction of anxiety in driving hoarding behaviour (see Grisham et al., 2011).

Emotion regulation also appears to be theoretically implicated in other aspects of hoarding phenomenology. For example, successful ER is predicted by executive functioning in the domains of working memory and attention (see Schmeichel & Tang, 2015). As individuals with HD experience executive functioning deficits, it is possible that they may have difficulty monitoring, differentiating, and regulating their emotions.
Indeed, neuroimaging and neuropsychological research suggests that individuals with compulsive hoarding demonstrate dysfunction in the neural systems that mediate ER (for reviews, see Grisham & Baldwin, 2015; S. Saxena, 2008). In addition, the features of low insight and poor response to treatment typically associated with the disorder may be linked with difficulty identifying feelings and poor emotional awareness (Pozza et al., 2015), which is consistent with research demonstrating poor or absent insight to be associated with high alexithymia levels in OCD patients (De Berardis et al., 2005). As such, the current project lends support to applying an ER theoretical framework to hoarding behaviour and phenomenology, which contributes to the accumulating literature on the link between ER deficits and various forms of psychopathology (see Berking & Wupperman, 2012; Hu et al., 2014).

Finally, the current project contributes to the literature on ER theory and research. Several ER constructs were simultaneously investigated in the prediction of hoarding symptoms, which may have implications for the conceptualisation and measurement of ER. For example, general emotion dysregulation and the difficulty identifying feelings aspect of alexithymia were found to contribute unique significant variance in hoarding symptoms when examined in a regression model with the other ER facets. Furthermore, EA was found to fully mediate the relationship between alexithymia and hoarding symptoms, highlighting how some aspects of ER influence other aspects in the prediction of symptomatology, which has implications for ongoing research in this area (e.g., causal pathways, interactions, and temporal considerations). However, this research also suggests a relatively high conceptual and empirical overlap between ER facets such as the DERS (Gratz & Roemer, 2004), AAQ-II (Bond et al., 2011), and TAS-20 (Bagby, Parker, et al., 1994), and between facets of negative and positive urgency (Lynam et al., 2007). Indeed, after controlling for relevant covariates, none of these ER constructs were found to contribute significant unique variance in hoarding when considered concurrently. Therefore, further clarification of these concepts should be an ongoing pursuit in the wider field of ER.

Clinical Implications

While ER is a widening area of investigation in psychological science and appears to represent a transdiagnostic process applicable to a range of psychopathologies, the current research project suggests that ER is relevant for HD, and
therefore has implications for clinical treatment. As the aspects of ER investigated in this project have been known to increase the risk for developing and maintaining various forms of psychopathology and yet are amenable to change, this research has implications for the assessment and treatment of HD.

Firstly, given the findings on alexithymia, it is recommended that an initial assessment of emotional vocabulary and competence may be useful for informing individualized case formulations, as this may reveal whether preliminary psychoeducation on emotions is required as an adjunct to traditional treatment interventions. Indeed, many therapeutic interventions assume that clients have access to their emotions, and when this is not the case, therapy may be difficult or unsuccessful (Kennedy & Franklin, 2002). As noted by Pozza et al. (2015), difficulty identifying feelings and poor emotional awareness may be linked to poorer insight of symptoms, and may help explain why individuals with HD tend to respond negatively to treatment. Cognitive-behavioural approaches do not traditionally focus on emotional awareness, and in the case of hoarding, CBT treatment may be enhanced by the addition of interventions aimed at improving emotional awareness and literacy. Such interventions may include techniques from the ER skills training module of DBT (Linehan, 1993), where clients are taught about the function of emotions, learn to identify and label a wide range of emotions and to recognise different levels of emotional intensity, learn about the physiological changes that accompany different emotions, and develop skills in communicating and expressing their emotions. Indeed, the strategy of affect labelling alone has been shown to have similar effects on self-reported distress as the use of reappraisal (Lieberman et al., 2011), and therefore may be applicable to the treatment of HD. Alternatively, the use of alexithymia-reduction techniques such as those developed by Vanheule et al. (2011) and Kennedy and Franklin (2002) may be beneficial. Such interventions include helping clients construct mental representations of difficult situations by verbalizing the chain of events that make up a difficult situation, gradually helping clients explore and articulate what is painful about the event, and addressing bodily experiences of distress and the client’s way of dealing with the difficult situation (Vanheule et al., 2011), and developing skills in differentiating and labelling emotions through in-session practice and keeping a feeling journal, validating the client’s emotional experiences and right to express their emotions, and helping clients to self-validate (Kennedy & Franklin, 2002). As difficulties with identifying and understanding
emotions is likely to make the prospect of experiencing emotions daunting, and therefore likely to make individuals with HD less willing to engage in tasks where emotions are activated (e.g., sorting and discarding tasks), addressing alexithymia as a separate aspect of treatment, or prior to other treatments, may have important implications for reducing symptoms, engagement in exposure tasks, treatment response, and relapse prevention (Kennedy & Franklin, 2002).

Further, in addition to emotional awareness training, interventions aimed at reducing EA and increasing DT are likely to be useful. It is acknowledged that cognitive-behavioural treatments for HD already involve exposure to discarding and not acquiring, which addresses an individual’s unwillingness to experience distress, and over time reduces the distress associated with these behaviours. However, more specific training in techniques aimed at reducing the avoidance of (and therefore increasing the acceptance of) a range of unwanted internal experiences such as unpleasant thoughts, feelings, and bodily sensations may be beneficial prior to exposure tasks. Interventions based on DBT (Linehan, 1993) or acceptance-based approaches (e.g., S. C. Hayes et al., 1999) may be useful for training clients to accept their internal states rather than engaging in EA, which is likely to lead to reductions in behavioural avoidance. Altering unhelpful beliefs about the emotional experience may also be achieved through psychoeducation on emotions and/or ACT-based interventions, which aim to cultivate an awareness of and non-judgemental attitude towards the emotional experience, a willingness to sit with that experience, and an understanding of emotions as transitory.

In addition, the findings from the current project pertaining to emotion dysregulation and emotion-based impulsivity suggests that elements of DBT (Linehan, 1993) or acceptance-based therapies (e.g., S. C. Hayes et al., 1999) may be useful for individuals with HD and may potentially enhance treatment outcomes. Indeed, DBT techniques specifically address impulsivity, emotion dysregulation, and distress intolerance, and have been successfully augmented to traditional CBT for other clinical disorders (e.g., trichotillomania; Keuthen & Sprich, 2012). The mindfulness skills taught in DBT are likely to be useful for increasing awareness of one’s emotions and urges, which will help individuals to recognize high-risk emotional states and mood-related triggers that are likely to prompt engaging in acquiring behaviours (A. D. Williams & Grisham, 2012). Additionally, mindfulness practice improves general attentional abilities, which is likely to be beneficial for individuals with HD given their
attentional difficulties. More specifically, increasing attentional focus through mindfulness may provide an avenue for ‘grounding’ individuals to their surroundings (as opposed to becoming absorbed in the acquiring experience) and may increase their awareness to a level where the individual can implement other strategies learned in therapy (A. D. Williams & Grisham, 2012). Distress tolerance training may include teaching clients to tolerate emotional distress in general, as well as tolerating specific emotions and urges that may trigger engagement in impulsive or other negatively reinforcing behaviours (A. D. Williams, 2012). Furthermore, as individuals with high levels of negative urgency may be more prone to premature drop-out, teaching DT skills and effective ER may assist with keeping such clients in therapy (Phung et al., 2015).

As such, DBT- or ACT-based interventions may be suitable for addressing general emotion dysregulation and negative and positive urgency, as such interventions aim to increase awareness and acceptance of triggers and internal reactions, and promote intentional rather than reactive behavioural responses (Bowen et al., 2009).

Most importantly, adjunct interventions should include ER skills training in order to provide individuals with HD with a broader range of ways of regulating their emotions. Given that chronic avoidance of emotions is thought to lead to dampened positive emotions and less frequent positive events (Kashdan et al., 2006), and HD is highly comorbid with depression (Frost, Steketee, et al., 2011; Tolin, Stevens, et al., 2012), interventions aimed at expanding an individual’s repertoire of adaptive ER strategies for invoking positive emotions are likely to be helpful. In combination with training on effective ways of regulating negative emotions, such interventions may decrease the reliance on aspects of hoarding behaviour as a method for regulating one’s emotions. Skills training in ER strategy use may also address perceptions about one’s ability to use effective strategies and may increase ER self-efficacy, as such training would expand the repertoire of available ER strategies, and provide psychoeducation and practice on the differential effectiveness of strategies depending on context.

In summary, the findings from the current study provide support for including psychoeducation on emotions and teaching effective strategies for regulating emotions within established CBT treatments. While recent meta-analytic studies suggest that CBT is an effective treatment for HD (Tolin et al., 2015; M. Williams & Viscusi, 2016), there is still room for improvement, and further research is required on which specific components of treatment are related to improved outcomes. It is suggested that such ER
interventions may assist with adherence to treatment and reducing symptoms, and may be helpful beyond hoarding-related emotional experiences (e.g., in processing and regulating loss, grief, or interpersonal experiences). Given the treatment-resistant nature of HD, improving treatments for the disorder is an important and worthy pursuit.

**Limitations and Future Directions**

It is important to acknowledge the limitations of the current research project and directions for future research. As noted throughout previous chapters, the use of non-clinical samples may potentially limit the generalizability of the findings from Study 1 and 2 to clinical hoarding populations. However, research on the nosology of hoarding suggests that it is likely a dimensional construct (Timpano, Broman-Fulks, et al., 2013) that occurs along a continuum in both non-clinical and clinical cohorts (Coles et al., 2003; Damecour & Charron, 1998; Steketee & Frost, 2003). Nonetheless, it is possible that the relationship between ER and hoarding differs across non-clinical and clinical populations, and there may be differences between the populations with regard to level of insight and ability to report ER abilities. As such, future research examining the relationships between hoarding symptoms and the aspects of ER investigated in this project is recommended with larger clinical hoarding samples. Indeed, in light of some of the inconsistencies in the literature on ER and HD, and given that the current project represents the first investigation of positive urgency and alexithymia in relation to hoarding, further research is required in these areas with clinical samples.

Another limitation is that the findings of this project cannot be generalized to individuals who are not represented by the sample characteristics. For example, the majority of participants for both quantitative studies were primarily Caucasian university students living in Australia. Additionally, the samples from each study were primarily female. As most research indicates that HD is equally prevalent across males and females (e.g., Bulli et al., 2014; Frost, Steketee, et al., 2011; Mueller et al., 2009; Steketee & Frost, 2014a) it is unclear whether the findings of the current project would generalize to the overall hoarding population. Future research with larger male samples is recommended in order to explore whether these relationships differ by gender. Similarly, future research with more ethnically diverse hoarding samples is required. While the clinical study included several individuals from different ethnic backgrounds, the findings cannot be generalized to the wider hoarding population due to the
qualitative nature of the study. Furthermore, as participants were purposively sampled from a treatment program, they may have had a higher level of motivation and insight into their emotional experiences and hoarding behaviour than non-treatment seeking populations, and may have already gained some awareness or skills from the group program.

The outcomes of this project were also limited by the use of self-report measures. Although psychometrically valid measures were used, and research suggests that data collection over the internet yields results comparable to those using a paper-and-pencil format (Carlbring et al., 2007; Coles, Cook, & Blake, 2007; Lewis, Watson, & White, 2009), the use of multi-method approaches such as behavioural measures assessing ER may be more reliable and valid, particularly given the poor insight associated with the disorder (Tolin, Fitch, et al., 2010). However, the current project utilised a mixed-methods design, and the inclusion of a qualitative interview study with a clinical sample was a strength of the current project. Indeed, the inclusion of mixed methods revealed some differential reporting across interview and self-report methods. For example, as there was some inconsistency between self-report and interview methods assessing impulse control difficulties, further investigation of HD individuals’ experiences of, and regulation of, emotion-based impulsivity may be beneficial.

As noted previously, self-report measures rely on participants’ ability to accurately report on their ER abilities, and may capture beliefs about one’s ER abilities, which may not be equivalent to one’s actual ER abilities. Indeed, research suggests that perceptions of impulsiveness do not equate with neurological tests of impulsiveness for non-clinical hoarding individuals (Fitch & Cougle, 2013). Some have questioned the extent to which individuals can accurately self-report on their ER strategies, as self-reports of emotions over short versus long timeframes measure qualitatively different sources of self-knowledge (M. D. Robinson & Clore, 2002). Furthermore, self-report measures may require more insight and meta-cognitive abilities than participants are capable of, may be influenced by negative moods or self-presentation biases, and may have considerable content overlap with psychopathology criterion measures (for discussion, see Aldao et al., 2010). As such, conclusions are limited by the reliance on self-report methods of emotional experiences and regulation abilities, particularly given that deficits in the ability to identify and describe emotions was revealed to be associated with hoarding. As noted by Pozza et al. (2015), perhaps individuals with
alexithymic characteristics, who experience diminished affective insight, cannot give an accurate estimation of their affective disturbances. Future research is recommended beyond the subjective domain, and could involve non-self-report measures of alexithymia, multimodal assessments of emotional responses and ER efforts through emotionally-inducing laboratory tasks, and physiological measures in order to more thoroughly investigate how individuals with HD experience and regulate their emotions (rather than how they think they regulate their emotions). It will be important to use experimental tasks to assess ER strategy use in different emotionally-activated states and in different contexts (e.g., during non-hoarding and hoarding-specific tasks). Additionally, studies where individuals with HD are randomly assigned to receive training in particular interventions (e.g., acceptance versus suppression versus no training) is required to assess the immediate impact of these interventions on discarding or acquiring behaviour (Ayers et al., 2014). Such research could also examine whether the relationship between beliefs about possessions and hoarding behaviours are modified by training in acceptance (Ayers et al., 2014).

Another limitation was the cross-sectional and correlational nature of the quantitative studies, which precludes a determination of whether ER difficulties cause or exacerbate hoarding symptoms, or are a result of symptoms. It could be that ER difficulties make individuals more prone to engage in problematic behaviours such as hoarding, or alternatively, that persistently engaging in behaviours that are negatively reinforcing depletes the resources required to effectively regulate one’s emotions or weakens one’s perceived or actual ability to tolerate the emotional experience (A. D. Williams, 2012; A. D. Williams & Grisham, 2012). In addition, conclusions cannot be drawn about the true directionality of the associations between aspects of alexithymia, EA, and hoarding symptoms. While there is theoretical rationale for the precedence of such ER difficulties in the ER-hoarding relationship, as noted by Tull and colleagues (2004), the experience of psychopathology in itself may lead to an increased tendency to avoid internal experiences. Likewise, it cannot be determined that underlying ER difficulties lead to the formation of strong attachment beliefs, which lead to problematic hoarding behaviour over time. It is proposed that in the presence of ER deficits, there may be a greater need for HD individuals to rely on possessions as a form of ER, which over time leads to stronger attachment beliefs, and ultimately results in clinical hoarding symptoms (Phung et al., 2015). However, this postulation requires further investigation,
particularly because the clinical sample in the current study generally did not identify using their possessions as a form of ER. As the data collected were limited to one moment in time, the potential effects of ER deficits could not be assessed longitudinally over time, and it remains to be seen whether the ER difficulties identified in this project represent vulnerability factors for the development of hoarding phenomena, maintaining factors, or consequences of hoarding symptomatology. Thus, future research exploring the temporal precedence of ER difficulties in hoarding through longitudinal and experimental designs is recommended.

Another limitation of correlational designs is that they do not rule out the possibility that a third, unmeasured variable influenced both ER deficits and hoarding symptoms. While the effects of known hoarding covariates (i.e., depressive and non-hoarding obsessive-compulsive symptoms) were controlled for in the first two studies, there were other variables that were not measured and controlled for. For example, it is unclear to what extent constructs such as emotional intensity, emotional reactivity, and general neuroticism may account for the findings of the current project. As such constructs are likely to be implicated in ER difficulties and hoarding symptoms, future research controlling for such variables is recommended. Due to the occurrence of comorbid GAD, social phobia, and ADHD in individuals with HD, comorbid disorders not assessed in this project may account for part or all of the ER difficulties reported by these samples. Indeed, research demonstrates that individuals with GAD experience greater difficulty identifying and describing emotions compared to community controls (Mennin et al., 2005; Onur et al., 2013). Additionally, information about comorbid ICDs was not collected in the current project, which limits the conclusions about whether impulsivity-related findings are related to HD or to other comorbid impulse control problems. Future research controlling for the effects of comorbid disorders on ER difficulties is therefore recommended. However, as noted by Tull and colleagues (2007), even if these relationships are due to comorbidity, that does not necessarily reduce their clinical significance, as ER difficulties are most likely a transdiagnostic factor common to a range of emotional disorders and therefore an important target for intervention (Barlow et al., 2004; Norton & Paulus, 2015; Werner & Gross, 2010). Even so, determining specificity to HD or establishing whether such ER difficulties are actually transdiagnostic may be important, as it may lead to different treatment interventions. Thus, future research in the area of ER in HD could benefit from
including comparison groups of individuals diagnosed with anxiety, depression, and ICDs.

Other third variable issues include contextual factors that may influence the relationship between emotion dysregulation and hoarding. Indeed, contextual factors are of key importance in determining how emotions are experienced and regulated (Aldao, 2013; Gross, 1998a), and may include the characteristics of the individual carrying out the regulation, such as age, gender, culture, personality traits, psychological processes (e.g., memory, attention, use of ER strategies, mood, ego strength, cognitive load), and psychopathology (Aldao, 2013). For example, research suggests that individual differences in executive functioning (e.g., working memory, response inhibition, task switching) are predictive of differences in successful ER (see Schmeichel & Tang, 2015), and a recent study found that attentional control moderates the association between difficulties accessing effective ER strategies and distress intolerance (Bardeen, Tull, Dixon-Gordon, Stevens, & Gratz, 2015). Given the impact of attention on ER (Schmeichel & Tang, 2015), and the attentional deficits associated with HD (see Timpano, Smith, et al., 2014; Woody et al., 2014), future research is recommended for exploring the moderating effects of attentional factors in the ER-hoarding relationship.

Furthermore, perceptions of and beliefs about one’s ability to regulate emotions is another factor worthy of consideration in future research, as research demonstrates that beliefs about emotions as fixed or malleable can influence the subsequent use of ER strategies (Kneeland, Nolen-Hoeksema, Dovidio, & Gruber, 2016) and that pessimistic expectancies about ER strategies moderates the relationship between EA and negative emotional reactions (Fergus, Bardeen, & Orcutt, 2013). While the findings from the current project suggest that HD participants hold unhelpful beliefs about the emotional experience and do not perceive that they have effective strategies for regulating emotions, the moderating role of beliefs and self-efficacy in the ER-hoarding relationship was not examined and requires future investigation. For example, newly developed measures such as the multidimensional assessment of ER and beliefs (Veilleux, Salomaa, Shaver, Zielinski, & Pollert, 2015) may be useful.

Future research may also benefit from exploring the impact of other potential confounding variables associated with hoarding such as decision-making difficulties and trauma histories, as these may impact on ER abilities. Indeed, given that many factors that are likely to be involved in the emotional bases of hoarding behaviour (e.g.,
family of origin, trauma, and developmental factors) may impact on ER abilities, these factors deserve further empirical attention. Furthermore, as the role of emotional attachment beliefs in the ER-hoarding relationship was established in the current project, future research examining the wider attachment construct in hoarding may be beneficial (cf. Kellett et al., 2010; Kellett & Holden, 2014; Moulding, Mancuso, Rehm, & Nedeljkovic, 2016).

At a broader level, this project is limited by the conceptual ambiguity and valid assessment of the ER construct, which is a known criticism of the ER literature in general (see Berking & Wupperman, 2012; Gross & Jazaieri, 2014; L. J. Robinson & Freeston, 2014). As noted by Berking and Wupperman (2012), the primary concern for ER as a scientific construct is that a number of various concepts are subsumed under the concept of ER, resulting in a loose conceptualisation. For example, while the strategies described by clinical participants in the current project were conceptualized within an ER framework, they could equally represent coping strategies. Indeed, as concepts such as ER, coping, and mood regulation overlap, further investigation is required to specify what actually constitutes ER (Berking & Wupperman, 2012).

Similarly, the ER field is challenged by the development of overlapping instruments and procedures that purport to validly and reliably measure ER (Berking & Wupperman, 2012). In addition to the aforementioned concerns about self-reporting in general, many ER self-report measures do not refer to specific emotions, but rather use terms such as ‘emotions’, ‘feelings’, or ‘upset’. As such, self-reported ER deficits may be due to specific characteristics of the emotion to which the individual refers when answering the question (Berking & Wupperman, 2012). Furthermore, many of the ER self-report measures share conceptual overlap which raises questions about whether they measure distinct concepts. Indeed, there is a fair amount of item content overlap between some of the facets of the ER measures utilized in this project. In particular, items from the difficulty identifying and describing feelings subscale of the TAS-20 (Bagby, Parker, et al., 1994) share conceptual overlap with the lack of emotional clarity facet of the DERS (Gratz & Roemer, 2004); items from the non-acceptance of emotional responses facet of the DERS may overlap with the AAQ-II (Bond et al., 2011) (and the latter scale was used to provide construct validity for the former scale); and negative urgency appears to overlap with the impulse control facet of the DERS. Additionally, given that the positive and negative urgency subscales of the UPPS-P
(Lynam et al., 2007) are highly correlated facets, some researchers have raised questions about the conceptual and practical distinction of these two pathways (Berg et al., 2015).

While there is indeed conceptual overlap between the ER measures utilized in the current project, the ER literature reviewed in Chapter 3 suggests that they are distinct, albeit related, constructs. Furthermore, when considered simultaneously without covariates, the facets of general emotion dysregulation and difficulty identifying feelings were found to be unique predictors of hoarding in the current study, suggesting that these two constructs are not completely overlapping. However, there is some suggestion that self-report measures of ER (such as emotion dysregulation, EA, and DT) are highly related constructs that share an underlying factor structure (Johnson, 2013) and it remains to be seen whether these measures actually assess separate facets of ER. Similarly, L. J. Robinson and Freeston (2014) have reviewed the research on alexithymia, AS, and DT in OCD and note that while all three constructs postulate a fundamental difficulty with emotional experience, they are indicative of different underlying deficits and it is unclear to what extent they overlap. As questions from the respective scales also capture a range of behaviours, attitudes, emotions, and beliefs, it is unclear what is being measured (L. J. Robinson & Freeston, 2014). According to Berking and Wupperman (2012), the validity of ER self-report measures needs further investigation and emotion-specific instruments should be developed.

In light of these issues, it is acknowledged that one of the main aims of the current project could not be addressed, as the factor analytic structure of the DERS (Gratz & Roemer, 2004) in both quantitative studies did not allow for a more fine-grained analysis of the six facets of emotion dysregulation in relation to specific hoarding behaviours. However, as noted previously, the results from both factor analyses are in line with recent research highlighting the psychometric limitations of the DERS (Bardeen et al., 2016; Bardeen et al., 2012; Cho & Hong, 2013; Lee et al., 2016). Given the limitations of the current project in relation to this measure, along with inconsistencies between the current findings and previous research on the DERS and HD (Fernández de la Cruz et al., 2013), future research utilising a recently modified version of the DERS (Bardeen et al., 2016) in relation to hoarding behaviour is recommended. A multidimensional measure of difficulties in regulating positive emotions (i.e., DERS-Positive; Weiss, Gratz, & Lavender, 2015) has been recently
developed, which may also be useful for investigating problematic responding to positive emotions in relation to hoarding.

In addition, it is acknowledged that in the current project correlations tended to be in the moderate range, and the amount of variance contributed by ER constructs to hoarding was small. While the sample size was reasonably large for regression-type analyses, it may have been hard to detect unique contributions when considering the ER variables simultaneously, particularly given the theoretical and empirical overlap between these constructs. Furthermore, the sample size of Study 2 and the conceptual overlap between the ER constructs precluded an exploration of more complex models. As such, future research utilizing structural equation modelling is recommended to examine multiple relationships between aspects of ER, cognitive factors, and hoarding symptoms.

In summary, in the context of the limitations of the current project, further research on the role of ER in compulsive hoarding is required in larger clinical samples, accounting for additional confounding variables (e.g., attention, beliefs about emotion), and examining the interaction of emotional and cognitive factors in the prediction of hoarding symptoms. Additionally, utilising more complex models to explore multiple relationships between aspects of ER, components of the CBT model, and hoarding symptomatology is recommended. To further examine how individuals with HD experience and regulate their emotions, multimodal assessments of emotional responses and ER efforts are recommended (e.g., physiological measures, experimental tasks that take into account different contexts and different emotional states). Furthermore, some of the suggested interventions described under clinical implications that are proposed to address ER deficits require empirical investigation in hoarding populations. Finally, ongoing efforts in the ER field are required in order to clarify some of the conceptual ambiguity of the ER construct and address some of the issues related to valid assessment, which will be important for future research in examining the role of ER in HD, as well as for informing how to help individuals change.

Conclusion

Given that HD has been recently recognized as a discrete diagnostic entity in DSM-5 (APA, 2013) and is associated with significant individual and societal burden, ongoing research into this debilitating disorder is required in order to aid clinical
understanding and improve the effectiveness of treatments. The findings of the current project contribute to the growing body of literature on hoarding, and in particular, contribute to the nascent area of emotional processes and regulation in HD. This project offered several new contributions to research by examining ER constructs that have received less investigation in relation to hoarding (such as positive urgency and alexithymia), examining the role of beliefs in the ER–hoarding relationship, and exploring the emotional experience and regulatory efforts of a clinical hoarding sample via qualitative interviews. Specifically, this project provided support for the relationships between general ER difficulties and hoarding symptoms and beliefs across two independent non-clinical samples. Support was also found for the role of two emotion-based facets of impulsivity in relation to hoarding symptoms across two non-clinical studies, with negative urgency demonstrating prominence over positive urgency in the prediction of hoarding. Additionally, in a non-clinical sample, the relationship between alexithymia and hoarding was established, along with support for the relationship between EA and hoarding. Furthermore, EA was found to fully mediate the alexithymia-hoarding relationship. In contrast to expectation, hoarding symptoms were not significantly related to the use of expressive suppression and cognitive reappraisal strategies. Prominent themes from the qualitative analysis were generally consistent with the findings of the non-clinical studies, providing further support for the presence of ER difficulties in HD. As such, the findings from this research project may have theoretical implications for the cognitive-behavioural model of HD and further understanding of the disorder, along with clinical implications for the treatment of HD. Finally, this project highlights that further research into the area of ER and hoarding is warranted.
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Appendices

Appendix A. Study 1 Documentation and Measures

A1. Study 1 Ethics Clearance

Monday 6th February, 2012 11.10 AM
From: Kaye Goldenberg
To: Dr Richard Moulding, FLSS/Ms Jasmine Taylor
CC: Ms Robyn Watson, Research Admin. Co-ordinator, FLSS
Subject: SUHREC Project 2012/004 Ethics Clearance

Dear Dr Moulding,

SUHREC Project 2012/004 Personality and Anxiety
Dr Richard Moulding, FLSS/Ms Jasmine Taylor
Approved Duration: 20/02/2012 to 31/08/2012

I refer to the ethical review of the above project protocol undertaken on behalf of Swinburne's Human Research Ethics Committee (SUHREC) by SUHREC Subcommittee (SHESC4) at a meeting held on 20 January 2012. Your response to the review as e-mailed on 31 January 2012 which included a request to replace the measure UPPS with an updated version (UPPS-P) was reviewed for sufficiency.

I am pleased to advise that, as submitted to date, the project has approval to proceed in line with standard on-going ethics clearance conditions here outlined.

- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the National Statement on Ethical Conduct in Human Research and with respect to secure data use, retention and disposal.

- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator/supervisor requires timely notification and SUHREC endorsement.

- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants and any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.

- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project.

- A duly authorised external or internal audit of the project may be undertaken at any time.
Please contact me if you have any queries about on-going ethics clearance. The SUHREC project number should be quoted in communication. Chief Investigators/Supervisors and Student Researchers should retain a copy of this e-mail as part of project record-keeping.

Best wishes for the project.

Yours sincerely

Kaye Goldenberg
Secretary, SHESC4

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Kaye Goldenberg
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Title: Personality and Anxiety
Dr Richard Moulding, Supervisor
Jasmine Taylor, Student Investigator

This study involves answering a number of anonymous questionnaires regarding personality, and also anxiety and depressive symptoms. Some demographic questions will also be asked. The study should take less than 1.5 hours to complete.

Please note that some questions about sensitive topics will be asked in this study. If you are uncomfortable with this you may wish not to participate (e.g., symptoms of depression and OCD, experiences of close relationships, and views you have about yourself).

If you decide to participate in this research, please complete the anonymous online survey. **It is important that you understand that your participation in this study must be voluntary.** You are free to discontinue participation at any time.

The principal reason for collecting your responses is to provide data for the use of Swinburne Students within their tutorials and lab report in the unit “The Psychology of Personality”. Anonymous data may be provided to students for their statistical analyses. The results of this study may also be used in the thesis of the student investigator. It may also be published in an academic journal or presented at academic conferences. Only grouped results would be published and no individual’s responses would be identifiable. Data for this study will be securely stored for a period of seven years before being destroyed.

If you have any questions about this project, please contact:
Dr Richard Moulding, Lecturer, Swinburne University of Technology, (03) 9214 4686, rmoulding@swin.edu.au.

If you experience any discomfort that you would like to discuss with a counsellor, possible services include:

- Swinburne Student Services, Hawthorn campus, phone: 9214 8025
  (Swinburne Students only)
- Swinburne Student Services, Lilydale campus, phone: 9215 7101
  (Swinburne Students only)
- Swinburne Psychology Clinic, phone: 9214 8653, psychclinic@swin.edu.au
- Lifeline, 13 11 14.

This project has been approved by or on behalf of Swinburne’s Human Research Ethics Committee (SUHREC) in line with the *National Statement on Ethical Conduct in Human Research*. If you have any concerns or complaints about the conduct of this project, you can contact:
Research Ethics Officer, Swinburne Research (H68),
Swinburne University of Technology, P O Box 218, HAWTHORN VIC 3122.
Tel (03) 9214 5218 or +61 3 9214 5218 or resethics@swin.edu.au

You may wish to print this page and retain for your records.
THANKS FOR PARTICIPATING!

Title: Personality and Anxiety

Dr Richard Moulding, Supervisor
Jasmine Taylor, Student Investigator

This project involved answering a number of questionnaires that are related to the laboratory report and/or tutorials for students in the unit “The Psychology of Personality”. For students of this unit, most of these scales will be discussed during the semester.

If you have any questions about this project, please contact: Dr Richard Moulding, Lecturer, Swinburne University of Technology, (03) 9214 4686, rmoulding@swin.edu.au.

If you experience any discomfort that you would like to discuss with a counsellor, possible services include:

Swinburne Student Services, Hawthorn campus, phone: 9214 8025
(Swinburne Students only)

Swinburne Student Services, Lilydale campus, phone: 9215 7101
(Swinburne Students only)

Swinburne Psychology Clinic, phone: 9214 8653, psychclinic@swin.edu.au

Lifeline, 13 11 14.

You may wish to print this page and retain for your records.
A4. Study 1 Demographic Questionnaire

1. Gender

2. Age

3. Continent of birth

- Australia/New Zealand
- Asia
- South America
- North America
- Europe
- Africa
- Other

4. How many years have you lived in Australia

5. Language(s) spoken at home

6. Highest Level of formal education (e.g., year 10)

7. Employment

- Full Time
- Part Time
- Casual
- Not employed

8. Marital status

- Married/De-Facto
- Committed Relationship
- Single

9. Are you a Swinburne student completing this study for the Research Experience Program?

   Yes    No
### A5. Saving Inventory Revised (SI-R; Frost et al., 2004)

<table>
<thead>
<tr>
<th>Question</th>
<th>Rating Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To what extent do you have difficulty throwing things away?</td>
<td>0 = Not at all 1 = To a mild extent. 2 = To a moderate extent. 3 = To a considerable extent. 4 = Very much so.</td>
</tr>
<tr>
<td>2. How distressing do you find the task of throwing things away?</td>
<td>0 = No distress 1 = Mild distress 2 = Moderate distress 3 = Severe distress 4 = Extreme distress</td>
</tr>
<tr>
<td>3. To what extent do you have so many things that your room(s) are cluttered?</td>
<td>0 = Not at all 1 = To a mild extent. 2 = To a moderate extent. 3 = To a considerable extent. 4 = Very much so.</td>
</tr>
<tr>
<td>4. How often do you avoid trying to discard possessions because it is too stressful or time-consuming?</td>
<td>0 = Never avoid, easily able to discard items 1 = Rarely avoid, can discard with a little difficulty 2 = Sometimes avoid 3 = Frequently avoid, can discard items occasionally 4 = Almost always avoid, rarely able to discard items</td>
</tr>
<tr>
<td>5. How distressed or uncomfortable would you feel if you could not acquire something you wanted?</td>
<td>0 = Not at all 1 = Mild, only slightly anxious 2 = Moderate, distress would mount but remain manageable 3 = Severe, prominent and very disturbing increase in distress 4 = Extreme, incapacitating discomfort from any such effort</td>
</tr>
<tr>
<td>6. How much of the living area in your home is cluttered with possessions? (Consider the amount of clutter in your kitchen, living room, dining room, hallways, bedrooms, bathrooms or other rooms.)</td>
<td>0 = None of the living area is cluttered 1 = Some of the living area is cluttered 2 = Much of the living area is cluttered 3 = Most of the living area is cluttered 4 = All or almost all of the living area is cluttered</td>
</tr>
<tr>
<td>7. How much does the clutter in your home interfere with your social, work or everyday functioning? Think about things that you don’t do because of clutter.</td>
<td>0 = Not at all 1 = Mild, slight interference, but overall functioning not impaired 2 = Moderate, definite interference, but still manageable 3 = Severe, causes substantial interference 4 = Extreme, incapacitating</td>
</tr>
<tr>
<td>8. How often do you feel compelled to acquire something you see (e.g., when shopping or offered free things)?</td>
<td>0 = Never feel compelled. 1 = Rarely feel compelled 2 = Sometimes feel compelled 3 = Frequently feel compelled. 4 = Almost always feel compelled.</td>
</tr>
<tr>
<td>9. How strong is your urge to buy or acquire free things for which you have no immediate use?</td>
<td>0 = Urge is not at all strong 1 = Mild urge 2 = Moderate urge 3 = Strong urge 4 = Very strong urge</td>
</tr>
<tr>
<td>Question</td>
<td>Options</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 10. How much control do you have over your urges to acquire possessions?| 0 = Complete control  
1 = Much control, usually able to control urges to acquire.  
2 = Some control, can control urges to acquire only with difficulty  
3 = Little control, can only delay urges to acquire only with great difficulty  
4 = No control, unable to stop urges to acquire possessions. |
| 11. How often do you decide to keep things you do not need and have little space for?| 0 = Never keep such things.  
1 = Rarely  
2 = Occasionally  
3 = Frequently  
4 = Almost always keep such possessions. |
| 12. To what extent does clutter prevent you from using parts of your home?| 0 = All parts of the home are usable  
1 = A few parts of the home are not usable  
2 = Some parts of the home are not usable  
3 = Many parts of the home are not usable  
4 = Nearly all parts of the home are not usable |
| 13. To what extent does the clutter in your home cause you distress?    | 0 = No feelings of distress or discomfort.  
1 = Mild feelings of distress or discomfort  
2 = Moderate feelings of distress or discomfort.  
3 = Severe feelings of distress or discomfort.  
4 = Extreme feelings of distress or discomfort. |
| 14. How frequently does the clutter in your home prevent you from inviting people to visit? | 0 = Not at all  
1 = Rarely  
2 = Sometimes.  
3 = Often.  
4 = Very often or nearly always. |
| 15. How often do you actually buy (or acquire for free) things for which you have no immediate use or need? | 0 = Never.  
1 = Rarely  
2 = Sometimes  
3 = Frequently  
4 = Almost always. |
| 16. How strong is your urge to save something you know you may never use?| 0 = Not at all strong  
1 = Mild urge  
2 = Moderate urge  
3 = Strong Urge  
4 = Very strong urge |
| 17. How much control do you have over your urges to save possessions? | 0 = Complete control  
1 = Much control, usually able to control urges to save.  
2 = Some control, can control urges to save only with difficulty  
3 = Little control, can only stop urges with great difficulty  
4 = No control, unable to stop urges to save possessions. |
| 18. How much of your home is difficult to walk through because of clutter?| 0 = None of it is difficult to walk through  
1 = Some of it is difficult to walk through  
2 = Much of it is difficult to walk through  
3 = Most of it is difficult to walk through  
4 = All or nearly all of it is difficult to walk through |
<table>
<thead>
<tr>
<th>Question</th>
<th>Scale</th>
</tr>
</thead>
</table>
| 19. How upset or distressed do you feel about your acquiring habits?    | 0 = Not at all upset  
1 = Mildly upset  
2 = Moderately upset  
3 = Severely upset  
4 = Extreme embarrassment |
| 20. To what extent does the clutter in your home prevent you from using parts of your home for their intended purpose? For example, cooking, using furniture, washing dishes, cleaning, etc.? | 0 = Never.  
1 = Rarely.  
2 = Sometimes.  
3 = Frequently.  
4 = Very frequently or almost all the time |
| 21. To what extent do you feel unable to control the clutter in your home? | 0 = Not at all  
1 = To a mild extent.  
2 = To a moderate extent  
3 = To a considerable extent.  
4 = Very much so |
| 22. To what extent has your saving or compulsive buying resulted in financial difficulties for you? | 0 = Not at all  
1 = A little financial difficulty  
2 = Some financial difficulty  
3 = Quite a lot of financial difficulty  
4 = An extreme amount of financial difficulty |
| 23. How often are you unable to discard a possession you would like to get rid of? | 0 = Never have a problem discarding possessions.  
1 = Rarely  
2 = Occasionally  
3 = Frequently  
4 = Almost always unable to discard possessions. |
A6. Saving Cognitions Inventory (SCI; Steketee et al., 2003)

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

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>not at all</td>
<td>sometimes</td>
<td>very much</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>I could not tolerate it if I were to get rid of this</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Throwing this away means wasting a valuable opportunity</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Throwing away this possession is like throwing away a part of me</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Saving this means I don’t have to rely on my memory</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>It upsets me when someone throws something of mine away without my permission</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Losing this possession is like losing a friend</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>If someone touches or uses this, I will lose it or lose track of it</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Throwing some things away would feel like abandoning a loved one</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Throwing this away means losing a part of my life</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>I see my belongings as extensions of myself; they are part of who I am</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>I am responsible for the well-being of this possession</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>If this possession may be of use to someone else, I am responsible for saving it for them</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>This possession is equivalent to the feelings I associate with it</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>My memory is so bad I must leave this in sight or I’ll forget about it</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>I am responsible for finding a use for this possession</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Throwing some things away would feel like part of me is dying</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>If I put this into a filing system, I’ll forget about it completely</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>I like to maintain sole control over my things</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>I’m ashamed when I don’t have something like this when I need it</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>I must remember something about this, and I can't if I throw this away</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>If I discard this without extracting all the important information from it, I will lose something</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>This possession provides me with emotional comfort</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>I love some of my belongings the way I love some people</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>No one has the right to touch my possessions</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A7. Depression, Anxiety, and Stress Scales (DASS-21; Lovibond and Lovibond, 1995)

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

_The rating scale is as follows:_
- 0 Did not apply to me at all
- 1 Applied to me to some degree, or some of the time
- 2 Applied to me to a considerable degree, or a good part of time
- 3 Applied to me very much, or most of the time

<table>
<thead>
<tr>
<th></th>
<th>Statement</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I found it hard to wind down</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>2</td>
<td>I was aware of dryness of my mouth</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>3</td>
<td>I couldn't seem to experience any positive feeling at all</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>4</td>
<td>I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>I found it difficult to work up the initiative to do things</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>6</td>
<td>I tended to over-react to situations</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>7</td>
<td>I experienced trembling (eg, in the hands)</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>8</td>
<td>I felt that I was using a lot of nervous energy</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>9</td>
<td>I was worried about situations in which I might panic and make a fool of myself</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>10</td>
<td>I felt that I had nothing to look forward to</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>11</td>
<td>I found myself getting agitated</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>12</td>
<td>I found it difficult to relax</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>13</td>
<td>I felt down-hearted and blue</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>14</td>
<td>I was intolerant of anything that kept me from getting on with what I was doing</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>15</td>
<td>I felt I was close to panic</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>16</td>
<td>I was unable to become enthusiastic about anything</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>17</td>
<td>I felt I wasn't worth much as a person</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>18</td>
<td>I felt that I was rather touchy</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>19</td>
<td>I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>20</td>
<td>I felt scared without any good reason</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>21</td>
<td>I felt that life was meaningless</td>
<td>0 1 2 3</td>
</tr>
</tbody>
</table>
A8. Obsessive-Compulsive Inventory Revised (OCI-R; Foa et al., 2002)

The following statements refer to experiences that many people have in their everyday lives. Circle the number that best describes **HOW MUCH** that experience has **DISTRESSED** or **BOthered** you during the **PAST MONTH**. The numbers refer to the following verbal labels:

<table>
<thead>
<tr>
<th>Item</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Not at all</td>
<td>1 A little</td>
</tr>
<tr>
<td>1. I have saved up so many things that they get in the way.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>2. I check things more often than necessary.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>3. I get upset if objects are not arranged properly.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>4. I feel compelled to count while I am doing things.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>5. I find it difficult to touch an object when I know it has been touched by strangers or certain people.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>6. I find it difficult to control my own thoughts.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>7. I collect things I don’t need.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>8. I repeatedly check doors, windows, drawers, etc.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>9. I get upset if others change the way I have arranged things.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>10. I feel I have to repeat certain numbers.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>11. I sometimes have to wash or clean myself simply because I feel contaminated.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>12. I am upset by unpleasant thoughts that come into my mind against my will.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>13. I avoid throwing things away because I am afraid I might need them later.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>14. I repeatedly check gas and water taps and light switches after turning them off.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>15. I need things to be arranged in a particular way.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>16. I feel that there are good and bad numbers.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>17. I wash my hands more often and longer than necessary.</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>18. I frequently get nasty thoughts and have difficulty in getting rid of them.</td>
<td>0 1 2 3 4</td>
</tr>
</tbody>
</table>
A9. Difficulties in Emotion Regulation Scale (DERS; Gratz and Roemer, 2004)

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost never</td>
<td>Sometimes</td>
<td>About half the time</td>
<td>Most of the time</td>
<td>Almost always</td>
</tr>
<tr>
<td>(0-10%)</td>
<td>(11-35%)</td>
<td>(36-65%)</td>
<td>(66-90%)</td>
<td>(91-100%)</td>
</tr>
</tbody>
</table>

Please indicate how often the following 36 statements apply to you by writing the appropriate number from the scale above (1 – 5) in the box alongside each item.

1. I am clear about my feelings.  
2. I pay attention to how I feel.  
3. I experience my emotions as overwhelming and out of control.  
4. I have no idea how I am feeling.  
5. I have difficulty making sense out of my feelings.  
6. I am attentive to my feelings.  
7. I know exactly how I am feeling.  
8. I care about what I am feeling.  
9. I am confused about how I feel.  
10. When I’m upset, I acknowledge my emotions.  
11. When I’m upset, I become angry with myself for feeling that way.  
12. When I’m upset, I become embarrassed for feeling that way.  
13. When I’m upset, I have difficulty getting work done.  
14. When I’m upset, I become out of control.  
15. When I’m upset, I believe that I will remain that way for a long time.  
16. When I’m upset, I believe that I'll end up feeling very depressed.  
17. When I’m upset, I believe that my feelings are valid and important.  
18. When I’m upset, I have difficulty focusing on other things.  
19. When I’m upset, I feel out of control.  
20. When I’m upset, I can still get things done.  
21. When I’m upset, I feel ashamed with myself for feeling that way.  
22. When I’m upset, I know that I can find a way to eventually feel better.  
23. When I’m upset, I feel like I am weak.  
24. When I’m upset, I feel like I can remain in control of my behaviors.  
25. When I’m upset, I feel guilty for feeling that way.  
26. When I’m upset, I have difficulty concentrating.  
27. When I’m upset, I have difficulty controlling my behaviors.  
28. When I’m upset, I believe there is nothing I can do to make myself feel better.  
29. When I’m upset, I become irritated with myself for feeling that way.  
30. When I’m upset, I start to feel very bad about myself.  
31. When I’m upset, I believe that wallowing in it is all I can do.  
32. When I’m upset, I lose control over my behaviors.  
33. When I’m upset, I have difficulty thinking about anything else.  
34. When I’m upset, I take time to figure out what I'm really feeling.  
35. When I’m upset, it takes me a long time to feel better.  
36. When I'm upset, my emotions feel overwhelming.
A10. UPPS-P Impulsive Behavior Scale (Lynam et al., 2007)

Below are a number of statements that describe ways in which people act and think. For each statement, please indicate how much you agree or disagree with the statement. If you Agree Strongly circle 1, if you Agree Somewhat circle 2, if you Disagree somewhat circle 3, and if you Disagree Strongly circle 4. Be sure to indicate your agreement or disagreement for every statement below. Also, there are questions on the following pages.

<table>
<thead>
<tr>
<th></th>
<th>Agree Strongly</th>
<th>Agree Somewhat</th>
<th>Disagree Somewhat</th>
<th>Disagree Strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I have a reserved and cautious attitude toward life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>I have trouble controlling my impulses.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>I generally seek new and exciting experiences and sensations.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>I generally like to see things through to the end.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>When I am very happy, I can’t seem to stop myself from doing things that can have bad consequences.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>My thinking is usually careful and purposeful.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7.</td>
<td>I have trouble resisting my cravings (for food, cigarettes, etc.).</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8.</td>
<td>I'll try anything once.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9.</td>
<td>I tend to give up easily.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10.</td>
<td>When I am in great mood, I tend to get into situations that could cause me problems.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11.</td>
<td>I am not one of those people who blurt out things without thinking.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12.</td>
<td>I often get involved in things I later wish I could get out of.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13.</td>
<td>I like sports and games in which you have to choose your next move very quickly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>14.</td>
<td>Unfinished tasks really bother me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>15.</td>
<td>When I am very happy, I tend to do things that may cause problems in my life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>16.</td>
<td>I like to stop and think things over before I do them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>17.</td>
<td>When I feel bad, I will often do things I later regret in order to make myself feel better now.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>18.</td>
<td>I would enjoy water skiing.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>19.</td>
<td>Once I get going on something I hate to stop.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>20.</td>
<td>I tend to lose control when I am in a great mood.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>21.</td>
<td>I don't like to start a project until I know exactly how to proceed.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>22.</td>
<td>Sometimes when I feel bad, I can’t seem to stop what I am doing even though it is making me feel worse.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>23.</td>
<td>I quite enjoy taking risks.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>24.</td>
<td>I concentrate easily.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>25.</td>
<td>When I am really ecstatic, I tend to get out of control.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>26.</td>
<td>I would enjoy parachute jumping.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>27.</td>
<td>I finish what I start.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>28.</td>
<td>I tend to value and follow a rational, &quot;sensible&quot; approach to things.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>29.</td>
<td>When I am upset I often act without thinking.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>30.</td>
<td>Others would say I make bad choices when I am extremely happy about something.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>31.</td>
<td>I welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>32.</td>
<td>I am able to pace myself so as to get things done on time.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>33.</td>
<td>I usually make up my mind through careful reasoning.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>34.</td>
<td>When I feel rejected, I will often say things that I later regret.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>35.</td>
<td>Others are shocked or worried about the things I do when I am feeling very excited.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>36.</td>
<td>I would like to learn to fly an airplane.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>37.</td>
<td>I am a person who always gets the job done.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>38.</td>
<td>I am a cautious person.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>39.</td>
<td>It is hard for me to resist acting on my feelings.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>40.</td>
<td>When I get really happy about something, I tend to do things that can have bad consequences.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>41.</td>
<td>I sometimes like doing things that are a bit frightening.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>42.</td>
<td>I almost always finish projects that I start.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>43.</td>
<td>Before I get into a new situation I like to find out what to expect from it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>44.</td>
<td>I often make matters worse because I act without thinking when I am upset.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>45.</td>
<td>When overjoyed, I feel like I can’t stop myself from going overboard.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>46.</td>
<td>I would enjoy the sensation of skiing very fast down a high mountain slope.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>47.</td>
<td>Sometimes there are so many little things to be done that I just ignore them all.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>48.</td>
<td>I usually think carefully before doing anything.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>49.</td>
<td>Before making up my mind, I consider all the advantages and disadvantages.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>50.</td>
<td>When I am really excited, I tend not to think of the consequences of my actions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>51.</td>
<td>In the heat of an argument, I will often say things that I later regret.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>52.</td>
<td>I would like to go scuba diving.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
53. I tend to act without thinking when I am really excited.  | 1 | 2 | 3 | 4  
54. I always keep my feelings under control.  | 1 | 2 | 3 | 4  
55. When I am really happy, I often find myself in situations that I normally wouldn’t be comfortable with.  | 1 | 2 | 3 | 4  
56. I would enjoy fast driving.  | 1 | 2 | 3 | 4  
57. When I am very happy, I feel like it is ok to give in to cravings or overindulge.  | 1 | 2 | 3 | 4  
58. Sometimes I do impulsive things that I later regret.  | 1 | 2 | 3 | 4  
59. I am surprised at the things I do while in a great mood  | 1 | 2 | 3 | 4  

Appendix B. Study 1 Principal Components Analysis for the DERS

Figure B1. Study 1 scree plot from principal components analysis with oblimin rotation requesting six factors for the DERS
### Table B1

*Study 1 Factor Loadings for the Six Factor Solution for the DERS*

<table>
<thead>
<tr>
<th>Item</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. When I’m upset, I have difficulty focusing on other things</td>
<td>.816 (G)</td>
</tr>
<tr>
<td>26. When I’m upset, I have difficulty concentrating</td>
<td>.816 (G)</td>
</tr>
<tr>
<td>33. When I’m upset, I have difficulty thinking about anything else</td>
<td>.731 (G)</td>
</tr>
<tr>
<td>13. When I’m upset, I have difficulty getting work done</td>
<td>.726 (G)</td>
</tr>
<tr>
<td>35. When I’m upset, it takes me a long time to feel better</td>
<td>.677 (S)</td>
</tr>
<tr>
<td>36. When I’m upset, my emotions feel overwhelming</td>
<td>.596 (S)</td>
</tr>
<tr>
<td>15. When I’m upset, I believe that I will remain that way for a long time</td>
<td>.539 (S) - .396</td>
</tr>
<tr>
<td>31. When I’m upset, I believe that wallowing in it is all I can do</td>
<td>.521 (S)</td>
</tr>
<tr>
<td>30. When I’m upset, I start to feel very bad about myself</td>
<td>.465 (S)  .394</td>
</tr>
<tr>
<td>16. When I’m upset, I believe that I’ll end up feeling very depressed</td>
<td>.456 (S)  -.392</td>
</tr>
<tr>
<td>28. When I’m upset, I believe that there is nothing I can do to make myself feel better</td>
<td>.433 (S)  -.330</td>
</tr>
<tr>
<td>6. I am attentive to my feelings (R)</td>
<td>.892 (A)</td>
</tr>
<tr>
<td>8. I care about what I am feeling (R)</td>
<td>.873 (A)</td>
</tr>
<tr>
<td>2. I pay attention to how I feel (R)</td>
<td>.859 (A)</td>
</tr>
<tr>
<td>10. When I’m upset, I acknowledge my emotions (R)</td>
<td>.663 (A)</td>
</tr>
<tr>
<td>7. I know exactly how I am feeling (R)</td>
<td>.452 (C)  -.444</td>
</tr>
<tr>
<td>21. When I’m upset, I feel ashamed with myself for feeling that way</td>
<td>.881 (N)</td>
</tr>
<tr>
<td>12. When I’m upset, I become embarrassed for feeling that way</td>
<td>.830 (N)</td>
</tr>
<tr>
<td>25. When I’m upset, I feel guilty for feeling that way</td>
<td>.770 (N)</td>
</tr>
<tr>
<td>29. When I’m upset, I become irritated with myself for feeling that way</td>
<td>.759 (N)</td>
</tr>
<tr>
<td>11. When I’m upset, I become angry with myself for feeling that way</td>
<td>.717 (N)</td>
</tr>
<tr>
<td>23. When I’m upset, I feel like I am weak</td>
<td>.477 (N)</td>
</tr>
<tr>
<td>4. I have no idea how I am feeling</td>
<td>-.814 (C)</td>
</tr>
<tr>
<td>5. I have difficulty making sense out of my feelings</td>
<td>-.779 (C)</td>
</tr>
<tr>
<td>9. I am confused about how I feel</td>
<td>-.616 (C)</td>
</tr>
<tr>
<td>3. I experience my emotions as overwhelming and out of control</td>
<td>-.307</td>
</tr>
<tr>
<td>1. I am clear about my feelings (R)</td>
<td>-.389 (C)</td>
</tr>
<tr>
<td>27. When I’m upset, I have difficulty controlling my behaviours</td>
<td>.636 (I)</td>
</tr>
<tr>
<td>14. When I’m upset, I become out of control</td>
<td>-.370</td>
</tr>
<tr>
<td>32. When I’m upset, I lose control over my behaviours</td>
<td>.323</td>
</tr>
<tr>
<td>19. When I’m upset, I feel out of control</td>
<td>.327</td>
</tr>
<tr>
<td>22. When I’m upset, I know that I can find a way to eventually feel better (R)</td>
<td>.321</td>
</tr>
<tr>
<td>24. When I’m upset, I feel like I can remain in control of my behaviours (R)</td>
<td>.333</td>
</tr>
<tr>
<td>34. When I’m upset, I take time to figure out what I’m really feeling (R)</td>
<td>.530 (A)</td>
</tr>
<tr>
<td>20. When I’m upset, I can still get things done (R)</td>
<td>.490</td>
</tr>
<tr>
<td>17. When I’m upset, I believe that my feelings are valid and important (R)</td>
<td>.445</td>
</tr>
</tbody>
</table>

*Note: G=Difficulties Engaging in Goal-Directed Behaviour; S=Limited Access to Emotion Regulation Strategies; A=Lack of Emotional Awareness; C=Lack of Emotional Clarity; N=Nonacceptance of Emotional Responses; I=Impulse Control Difficulties.*
### Table B2

#### Study 1 Pattern and Structure Matrix for Two Factor Solution of the DERS Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Pattern Coefficients</th>
<th>Structure Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Comp. 1</td>
<td>Comp. 2</td>
</tr>
<tr>
<td>36. When I’m upset, my emotions feel overwhelming</td>
<td>.841</td>
<td>-.111</td>
</tr>
<tr>
<td>30. When I’m upset, I start to feel very bad about myself</td>
<td>.827</td>
<td>.045</td>
</tr>
<tr>
<td>33. When I’m upset, I have difficulty thinking about anything else</td>
<td>.822</td>
<td>-.103</td>
</tr>
<tr>
<td>19. When I’m upset, I feel out of control</td>
<td>.805</td>
<td>.031</td>
</tr>
<tr>
<td>26. When I’m upset, I have difficulty concentrating</td>
<td>.801</td>
<td>-.195</td>
</tr>
<tr>
<td>29. When I’m upset, I become irritated with myself for feeling that way</td>
<td>.789</td>
<td>-.082</td>
</tr>
<tr>
<td>16. When I’m upset, I believe that I’ll end up feeling very depressed</td>
<td>.787</td>
<td>.174</td>
</tr>
<tr>
<td>32. When I’m upset, I lose control over my behaviours</td>
<td>.784</td>
<td>-.062</td>
</tr>
<tr>
<td>27. When I’m upset, I have difficulty controlling my behaviours</td>
<td>.774</td>
<td>-.098</td>
</tr>
<tr>
<td>35. When I’m upset, it takes me a long time to feel better</td>
<td>.772</td>
<td>.048</td>
</tr>
<tr>
<td>18. When I’m upset, I have difficulty focusing on other things</td>
<td>.761</td>
<td>-.113</td>
</tr>
<tr>
<td>3. I experience my emotions as overwhelming and out of control</td>
<td>.760</td>
<td>-.097</td>
</tr>
<tr>
<td>28. When I’m upset, I believe that there is nothing I can do to make myself feel better</td>
<td>.753</td>
<td>.117</td>
</tr>
<tr>
<td>15. When I’m upset, I believe that I will remain that way for a long time</td>
<td>.751</td>
<td>.103</td>
</tr>
<tr>
<td>13. When I’m upset, I have difficulty getting work done</td>
<td>.751</td>
<td>-.135</td>
</tr>
<tr>
<td>14. When I’m upset, I become out of control</td>
<td>.734</td>
<td>.047</td>
</tr>
<tr>
<td>25. When I’m upset, I feel guilty for feeling that way</td>
<td>.722</td>
<td>-.026</td>
</tr>
<tr>
<td>11. When I’m upset, I become angry with myself for feeling that way</td>
<td>.720</td>
<td>-.039</td>
</tr>
<tr>
<td>21. When I’m upset, I feel ashamed with myself for feeling that way</td>
<td>.711</td>
<td>-.035</td>
</tr>
<tr>
<td>23. When I’m upset, I feel like I am weak</td>
<td>.709</td>
<td>.054</td>
</tr>
<tr>
<td>31. When I’m upset, I believe that wallowing in it is all I can do</td>
<td>.704</td>
<td>.095</td>
</tr>
<tr>
<td>12. When I’m upset, I become embarrassed for feeling that way</td>
<td>.671</td>
<td>-.066</td>
</tr>
<tr>
<td>9. I am confused about how I feel</td>
<td>.620</td>
<td>.123</td>
</tr>
<tr>
<td>5. I have difficulty making sense out of my feelings</td>
<td>.532</td>
<td>.307</td>
</tr>
<tr>
<td>4. I have no idea how I am feeling</td>
<td>.464</td>
<td>.368</td>
</tr>
<tr>
<td>20. When I’m upset, I can still get things done (R)</td>
<td>.297</td>
<td>.232</td>
</tr>
<tr>
<td>6. I am attentive to my feelings (R)</td>
<td>-.114</td>
<td>.825</td>
</tr>
<tr>
<td>2. I pay attention to how I feel (R)</td>
<td>-.137</td>
<td>.823</td>
</tr>
<tr>
<td>8. I care about what I am feeling (R)</td>
<td>-.117</td>
<td>.814</td>
</tr>
<tr>
<td>7. I know exactly how I am feeling (R)</td>
<td>.215</td>
<td>.725</td>
</tr>
<tr>
<td>10. When I’m upset, I acknowledge my emotions (R)</td>
<td>-.076</td>
<td>.671</td>
</tr>
<tr>
<td>34. When I’m upset, I take time to figure out what I’m really feeling (R)</td>
<td>-.130</td>
<td>.652</td>
</tr>
<tr>
<td>1. I am clear about my feelings (R)</td>
<td>.295</td>
<td>.571</td>
</tr>
<tr>
<td>17. When I’m upset, I believe that my feelings are valid and important (R)</td>
<td>.003</td>
<td>.509</td>
</tr>
<tr>
<td>22. When I’m upset, I know that I can find a way to eventually feel better (R)</td>
<td>.378</td>
<td>.480</td>
</tr>
<tr>
<td>24. When I’m upset, I feel like I can remain in control of my behaviours (R)</td>
<td>.350</td>
<td>.400</td>
</tr>
</tbody>
</table>

**Note:** Comp = Component; A = Lack of Emotional Awareness; C = Lack of Emotional Clarity; S = Limited Access to Emotion Regulation Strategies; I = Impulse Control Difficulties.
### Appendix C. Study 1 Facets of Urgency Predicting Hoarding Symptom Dimensions

Table C1
Summary of Hierarchical Multiple Regression Analyses for Negative and Positive Urgency Predicting Difficulty Discarding, Excessive Acquisition, and Excessive Clutter after Controlling for Covariates

<table>
<thead>
<tr>
<th>Step</th>
<th>Predictor Variables</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>sr²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dependent variable SI-R Discarding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>DASS-21 Dep</td>
<td>.08</td>
<td>.05</td>
<td>.12</td>
<td>1.50</td>
<td>.136</td>
<td>.009</td>
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<td>.05</td>
<td>.15</td>
<td>2.11</td>
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<td>.018</td>
</tr>
<tr>
<td>3</td>
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<td>.30</td>
<td>3.76</td>
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<td>.058</td>
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<td>ΔF = 14.17***</td>
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<tr>
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<td>3.22</td>
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<td>.04</td>
<td>.03</td>
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<td>.37</td>
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<td>.087</td>
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<tr>
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<td>Positive Urgency</td>
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<td>.64</td>
<td>.13</td>
<td>1.74</td>
<td>.084</td>
<td>.014</td>
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<td></td>
<td>R² = .08</td>
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<td>ΔF = 3.01 ns</td>
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<td></td>
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</tbody>
</table>

Note: Negative Urgency Models N=198; Positive Urgency Models N=199.

*** p<.001, ** p<.01, * p<.05 (two-tailed), ns=non-significant

SI-R=Savings Inventory Revised; Discarding=Difficulty Discarding; Acquisition=Excessive Acquisition; Clutter=Excessive Clutter; DASS-21=Depression Anxiety and Stress Scales 21; Dep=Depression; OCIR-NH=Obsessive Compulsive Inventory Revised Non-Hoarding Symptoms; Negative Urgency=Negative Urgency subscale of the UPPS-P Impulsive Behavior Scale; Positive Urgency=Positive Urgency subscale of the UPPS-P Impulsive Behavior Scale.
Appendix D: Study 1 Mediation Analysis for the Role of Saving Cognitions in the
ER-Hoarding Relationship

To test whether saving cognitions mediated the relationship between ER difficulties and hoarding symptoms, a mediation model using transformed variables was conducted through SPSS 21 via the Preacher and Hayes ‘Indirect’ macro (Preacher & Hayes, 2008) using the procedure described in Study 1. The mediation model with unstandardized B weights is illustrated in Figure C1. ER difficulties were positively associated with hoarding symptoms (B = 2.54, t(195) = 3.07, p < .01), and positively associated with saving cognitions (B = 0.27, t(195) = 2.51, p < .05). The mediator, saving cognitions, was positively associated with hoarding symptoms (B = 3.04, t(195) = 5.95, p < .001). The bootstrapped estimates were used to examine the indirect effect of ER difficulties (DERS total MA) on hoarding symptoms (SI-R total) via saving cognitions (SCI total). The bootstrapped estimates indicated that the indirect effect was statistically significant (B = 0.80; 95% CI = 0.14 to 1.66). As the direct effect of ER difficulties on hoarding behaviour remained significant when controlling for saving cognitions (B = 1.72, t(194) = 2.23, p < .05), this suggests partial mediation.

Figure D1. Indirect effect of ER difficulties on hoarding symptoms through saving cognitions.

Note: N=199. ***p<.001, **p<.01,*p<.05
Dashed line represents c’ pathway
Overall R² = 0.33. Depression and non-hoarding obsessive-compulsive symptoms included as covariates, but not depicted here.
Appendix E. Study 2 Documentation and Measures

E1. Study 2 Ethics Clearance

Tuesday, 6 March 2012 17:03
From: Resethics@groupwise.swin.edu.au
To: Dr Richard Moulding, FLSS, Ms Jasmine Taylor
CC: Ms Robyn Watson, Research Admin. Co-ordinator, FLSS

Dear Dr Moulding,

SUHREC Project 2012/022 Investigating the relationship between emotional reactivity, emotion regulation, and symptoms of compulsive hoarding
Dr Richard Moulding, FLSS, Ms Jasmine Taylor
Approved Duration: 06/03/2012 To 06/03/2013 [Adjusted]

Ethical review of the above project protocol was undertaken on behalf of Swinburne's Human Research Ethics Committee (SUHREC) by a SUHREC Subcommittee (SHESC2) at a meeting held 2 March 2012, the outcome of which as follows.

Subcommittee wished to commend Researchers on an excellent application, noting in particular, the well written and informative debriefing letter.

I am pleased to advise that, as submitted to date, the project has approval to proceed in line with standard on-going ethics clearance conditions here outlined.

- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the National Statement on Ethical Conduct in Human Research and with respect to secure data use, retention and disposal.

- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator/supervisor requires timely notification and SUHREC endorsement.

- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/ clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants and any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.

- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project.

- A duly authorised external or internal audit of the project may be undertaken at any time.
Please contact the Research Ethics Office if you have any queries about on-going ethics clearance, citing the SUHREC project number. Please retain a copy of this clearance email as part of project record-keeping.

Best wishes for the project.

Yours sincerely

Kaye Goldenberg
Secretary, SHESC2

Kaye Goldenberg
Administrative Officer (Research Ethics)
Swinburne Research (H68)
Swinburne University of Technology
P O Box 218E
HAWTHORN VIC 3122
Tel +61 3 9214 8468
E2. Study 2 Consent Information Statement

Title: Investigating the relationship between emotional reactivity, emotion regulation, and symptoms of compulsive hoarding

Investigators: Dr Richard Moulding, Supervisor
Jasmine Taylor, Student Investigator
Swinburne University of Technology

This study involves completing a number of anonymous online questionnaires about how you experience and manage your emotions, beliefs about everyday experiences related to hoarding and OCD, and depressive and anxiety symptoms. Participation in this study should take less than 60 minutes to complete.

Please note that some questions about sensitive topics will be asked in this study (e.g., symptoms of depression, anxiety, hoarding, OCD, and views you have about yourself). If you are uncomfortable with this you may wish not to participate.

We are seeking people without a diagnosis of compulsive hoarding to do this research. If you have compulsive hoarding disorder you are free to continue although you may find some questions to be confronting. If you are concerned about your compulsive hoarding behaviour, please contact Swinburne Psychology Clinic on (03) 9214 8653.

If you decide to participate in this research, please complete the anonymous online survey. It is important that you understand that your participation in this study must be voluntary. You are free to discontinue participation at any time by closing your internet browser. Once you have completed the questionnaire your data cannot be withdrawn because it is anonymous and cannot be traced.

The current study aims to contribute to an understanding of the role of emotion dysregulation in compulsive hoarding behavior. The results of this study may be used in the thesis of the student investigator, and may also be published in an academic journal or presented at academic conferences. Only grouped results would be published and no individual’s responses would be identifiable. Data for this study will be securely stored for a period of seven years before being destroyed.

If you would like further information about the project, please do not hesitate to contact Dr Richard Moulding, Lecturer, Swinburne University of Technology, (03) 9214 4686, rmoulding@groupwise.swin.edu.au

If you experience any discomfort during this study that you would like to discuss with a counsellor, possible services include:
- Swinburne Student Services, Hawthorn campus, phone: 9214 8025
- Swinburne Student Services, Lilydale campus, phone: 9215 7101
- Swinburne Psychology Clinic, phone: 9214 8653, psychclinic@swin.edu.au
- Lifeline, 13 11 14.

This project has been approved by or on behalf of Swinburne's Human Research Ethics Committee (SUHREC) in line with the National Statement on Ethical Conduct in Human Research. If you have any concerns or complaints about the conduct of this project, you can contact:
Research Ethics Officer, Swinburne Research (H68),
Swinburne University of Technology, P O Box 218, HAWTHORN VIC 3122.
Tel (03) 9214 5218 or +61 3 9214 5218 or resethics@swin.edu.au

You may wish to print this page and retain for your records.
E3. Study 2 Debriefing Statement

Title: Investigating the relationship between emotional reactivity, emotion regulation, and symptoms of compulsive hoarding

Investigators: Dr Richard Moulding, Supervisor
Jasmine Taylor, Student Investigator
Swinburne University of Technology

Thank you for your participation in this study!

This project involved answering a number of questionnaires about how you experience and manage your emotions, beliefs about everyday experiences related to hoarding and OCD, and measures of depression and anxiety.

If you have any questions about this project, please contact: Dr Richard Moulding, Lecturer, Swinburne University of Technology, (03) 9214 4686, rmoulding@swin.edu.au.

If you experience any discomfort that you would like to discuss with a counsellor, possible services include:

- Swinburne Student Services, Hawthorn campus, phone: 9214 8025 (Swinburne Students only)
- Swinburne Student Services, Lilydale campus, phone: 9215 7101 (Swinburne Students only)
- Swinburne Psychology Clinic, phone: 9214 8653, psychclinic@swin.edu.au
- Lifeline, 13 11 14.

Once again, thank you for your participation in this research project.

You may wish to print this page and retain for your records.
**E4. The Acceptance and Action Questionnaire II (AAQ-II; Bond et al., 2011)**

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

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>never true</td>
<td>very seldom true</td>
<td>seldom true</td>
<td>sometimes true</td>
<td>frequently true</td>
<td>almost always true</td>
<td>always true</td>
</tr>
</tbody>
</table>

1. My painful experiences and memories make it difficult for me to live a life that I would value.  
2. I’m afraid of my feelings.  
3. I worry about not being able to control my worries and feelings.  
4. My painful memories prevent me from having a fulfilling life.  
5. Emotions cause problems in my life.  
6. It seems like most people are handling their lives better than I am.  
7. Worries get in the way of my success.
E5. The Toronto Alexithymia Scale (TAS-20; Bagby et al., 1994)

Please rate your level of agreement with each statement using the scale below.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Neither Disagree or Agree</td>
<td>Agree</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

1. I am often confused about what emotion I am feeling ______
2. It is difficult for me to find the right words for my feelings ______
3. I have physical sensations that even doctors don't understand ______
4. I am able to describe my feelings easily ______
5. I prefer to analyze problems rather than just describe them ______
6. When I am upset, I don’t know if I am sad, frightened, or angry ______
7. I find it hard to describe how I feel about people ______
8. I prefer to just let things happen rather than to understand why they turned out that way ______
9. I have feelings that I can't quite identify ______
10. Being in touch with emotions is essential ______
11. I am often puzzled by sensations in my body ______
12. People tell me to describe my feelings more ______
13. I don't know what's going on inside me ______
14. I often don't know why I am angry ______
15. I prefer talking to people about their daily activities rather than their feelings ______
16. I prefer to watch "light" entertainment shows rather than psychological dramas ______
17. It is difficult for me to reveal my innermost feelings, even to close friends ______
18. I can feel close to someone, even in moments of silence ______
19. I find examination of my feelings useful in solving personal problems ______
20. Looking for hidden meanings in movies or plays distracts from their enjoyment ______
E6. The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003)

Instructions and Items

We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

1-----------------2-----------------3--------------4--------------5-----------------6--------------7
Strongly disagree                neutral                Strongly agree

1. When I want to feel more positive emotion (such as joy or amusement), I change what I’m thinking about ____

2. I keep my emotions to myself ____

3. When I want to feel less negative emotion (such as sadness or anger), I change what I’m thinking about ____

4. When I am feeling positive emotions, I am careful not to express them ____

5. When I’m faced with a stressful situation, I make myself think about it in a way that helps me stay calm ____

6. I control my emotions by not expressing them ____

7. When I want to feel more positive emotion, I change the way I’m thinking about the situation ____

8. I control my emotions by changing the way I think about the situation I’m in ____

9. When I am feeling negative emotions, I make sure not to express them ____

10. When I want to feel less negative emotion, I change the way I’m thinking about the situation ____
Appendix F. Study 2 Principal Components Analysis for the DERS

Using SPSS 21, the 36 items of the DERS from Study 2 were subjected to a PCA with an oblique (oblimin) rotation and the number of factors to be extracted was set at six. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The KMO obtained was .92 and Bartlett’s Test of Sphericity was significant (p<.001), supporting the factorability of the correlation matrix. Using Kaiser’s criterion, the first six components recorded eigenvalues above 1, and collectively explained a total of 70.87% of the variance. Inspection of the scree plot however revealed a clear break between the second and the third component, demonstrating that component 1 and 2 captured much more of the variance (54.97%) than the remaining components. There was also a break between the third and fourth components (see Figure F1 below). Inspection of the component matrix revealed that most items loaded strongly (above .4) on the first two components. Similar to the findings from Study 1, apart from one item (item 20), all items on components 3, 4, 5, and 6 loaded more strongly on either component 1 or 2.

Inspection of the rotated six-factor solution in the pattern matrix showed five items loading on Component 1, eight items on Component 2, four items on Component 3, seven items on Component 4, six items on Component 5, and six items on Component 6. However, consistent with the findings from Study 1, the items did not correspond with the theoretical factors, most components contained a mix of items from different subscales, and only the items from the non-acceptance of emotional responses subscale loaded on its theoretical factor (see Table F1 below).

As the six-factor solution for the DERS in the current study did not correspond fully with the six theorized factors, further tests were conducted to ascertain the number of factors to be retained. A parallel analysis was conducted using the program Monte Carlo PCA for Parallel Analysis in SPSS, with results suggesting that three factors be retained. However, a subsequent PCA with oblimin rotation extracting three factors revealed that most items loaded more strongly on Component 1 or 2, and the rotated three factor solution did not reflect any of the theoretical factors accurately. A Very Simple Structure (VSS) test was also run in R 3.0.2 using all 36 DERS items which recommended retaining two factors. A PCA with oblimin rotation was conducted in SPSS extracting two factors. The two-factor solution explained 54.97% of the variance, with Component 1 contributing 40.48% and Component 2 contributing 14.49%. Similar to Study 1, an inspection of the rotated two-factor solution showed that Component 2 was comprised entirely of the reverse-scored items of the scale and therefore included all items from the lack of emotional awareness subscale (see Table F2 below for the pattern and structure matrix for the two-factor solution). Consistent with the findings from Study 1, most of the reverse-scored items from the other subscales also loaded onto factor one, and therefore, it was decided to retain the DERS total (MA) variable for Study 2.

---

6 A factor analysis was also performed using Principal Axis Factoring (PAF) on the 36 items of the DERS which revealed a similar pattern of results. Removing the six items of the lack of awareness subscale and subjecting the 30 items of the DERS to PAF also did not result in items falling in their theoretical factors.
Figure F1. Study 2 scree plot from principal components analysis with oblimin rotation requesting six factors for the DERS
Table F1

Study 2 Factor Loadings for the Six Factor Solution for the DERS

<table>
<thead>
<tr>
<th>Item</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am clear about my feelings (R)</td>
<td>.737 (C)</td>
</tr>
<tr>
<td>I pay attention to how I feel (R)</td>
<td>.854 (A)</td>
</tr>
<tr>
<td>I am attentive to my feelings (R)</td>
<td>.813 (A)</td>
</tr>
<tr>
<td>I know exactly how I am feeling (R)</td>
<td>.670 (C)</td>
</tr>
<tr>
<td>I care about what I am feeling (R)</td>
<td>.830 (A)</td>
</tr>
<tr>
<td>When I’m upset, I acknowledge my emotions (R)</td>
<td>.801 (A)</td>
</tr>
<tr>
<td>When I’m upset, I believe that my feelings are valid and important</td>
<td>.632 (A)</td>
</tr>
<tr>
<td>When I’m upset, I can still get things done (R)</td>
<td>.651 (G)</td>
</tr>
<tr>
<td>When I’m upset, I know that I can find a way to eventually feel</td>
<td>.378 (.541 (S)</td>
</tr>
<tr>
<td>When I’m upset, I feel like I can remain in control of my behaviours</td>
<td>.682 (I)</td>
</tr>
<tr>
<td>When I’m upset, I take time to figure out what I’m really</td>
<td>.430 (.477 (A)</td>
</tr>
<tr>
<td>I experience my emotions as overwhelming and out of control</td>
<td>-.609 (I)</td>
</tr>
<tr>
<td>I have no idea how I am feeling</td>
<td>-.812 (C)</td>
</tr>
<tr>
<td>I have difficulty making sense out of my feelings</td>
<td>-.774 (C)</td>
</tr>
<tr>
<td>I am confused about how I feel</td>
<td>-.493 (C)</td>
</tr>
<tr>
<td>When I’m upset, I become angry with myself for feeling that way</td>
<td>-.388 .635 (N)</td>
</tr>
<tr>
<td>When I’m upset, I become embarrassed for feeling that way</td>
<td>-.379 .692 (N)</td>
</tr>
<tr>
<td>When I’m upset, I have difficulty getting work done</td>
<td>.835 (G)</td>
</tr>
<tr>
<td>When I’m upset, I become out of control</td>
<td>.370 -.417 (I)</td>
</tr>
<tr>
<td>When I’m upset, I believe that I will remain that way for a long</td>
<td>.580 (S)</td>
</tr>
<tr>
<td>When I’m upset, I believe that I’ll end up feeling very depressed</td>
<td>.564 (S)</td>
</tr>
<tr>
<td>When I’m upset, I have difficulty focusing on other things</td>
<td>.501 (I)</td>
</tr>
<tr>
<td>When I’m upset, I feel ashamed with myself for feeling that way</td>
<td>-.325 .727 (N)</td>
</tr>
<tr>
<td>When I’m upset, I feel like I am weak</td>
<td>.529 (N)</td>
</tr>
<tr>
<td>When I’m upset, I feel guilty for feeling that way</td>
<td>.776 (N)</td>
</tr>
<tr>
<td>When I’m upset, I have difficulty concentrating my behaviours</td>
<td>.719 (I)</td>
</tr>
<tr>
<td>When I’m upset, I believe that there is nothing I can do to make</td>
<td>.423 (S)</td>
</tr>
<tr>
<td>When I’m upset, I become irritated with myself for feeling</td>
<td>-.379 .566 (N)</td>
</tr>
<tr>
<td>When I’m upset, I start to feel very bad about myself</td>
<td>.396 (S)</td>
</tr>
<tr>
<td>When I’m upset, I believe that wallowing in it is all I can do</td>
<td>.340 .381 (S)</td>
</tr>
<tr>
<td>When I’m upset, I lose control over my behaviours</td>
<td>.583 (I)</td>
</tr>
<tr>
<td>When I’m upset, I have difficulty thinking about anything else</td>
<td>-.304 .753 (G)</td>
</tr>
<tr>
<td>When I’m upset, it takes me a long time to feel better</td>
<td>.439 (S)</td>
</tr>
<tr>
<td>When I’m upset, my emotions feel overwhelming</td>
<td>.367 .476 (S)</td>
</tr>
</tbody>
</table>

Note: G=Difficulties Engaging in Goal-Directed Behaviour; S=Limited Access to Emotion Regulation Strategies; A=Lack of Emotional Awareness; C=Lack of Emotional Clarity; N=Nonacceptance of Emotional Responses; I=Impulse Control Difficulties.
### Table F2

**Study 2 Pattern and Structure Matrix for Two Factor Solution of the DERS Items**

<table>
<thead>
<tr>
<th>Item</th>
<th>Pattern Coefficients</th>
<th>Structure Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Comp. 1</td>
<td>Comp. 2</td>
</tr>
<tr>
<td>1. I am clear about my feelings (R)</td>
<td>.281</td>
<td>.726</td>
</tr>
<tr>
<td>2. I pay attention to how I feel (R)</td>
<td>-.041</td>
<td>.855</td>
</tr>
<tr>
<td>6. I am attentive to my feelings (R)</td>
<td>-.058</td>
<td>.850</td>
</tr>
<tr>
<td>7. I know exactly how I am feeling (R)</td>
<td>.320</td>
<td>.689</td>
</tr>
<tr>
<td>8. I care about what I am feeling (R)</td>
<td>.004</td>
<td>.820</td>
</tr>
<tr>
<td>10. When I’m upset, I acknowledge my emotions (R)</td>
<td>.005</td>
<td>.735</td>
</tr>
<tr>
<td>11. When I’m upset, I believe that my feelings are valid and</td>
<td>-.095</td>
<td>.762</td>
</tr>
<tr>
<td>important (R)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. When I’m upset, I can still get things done (R)</td>
<td>.260</td>
<td>.330</td>
</tr>
<tr>
<td>22. When I’m upset, I know that I can find a way to eventually</td>
<td>.135</td>
<td>.649</td>
</tr>
<tr>
<td>feel better (R)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. When I’m upset, I feel like I can remain in control of my</td>
<td>.317</td>
<td>.429</td>
</tr>
<tr>
<td>behaviours (R)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34. When I’m upset, I take time to figure out what I’m really</td>
<td>-.232</td>
<td>.709</td>
</tr>
<tr>
<td>feeling (R)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I experience my emotions as overwhelming and out of</td>
<td>.743</td>
<td>.018</td>
</tr>
<tr>
<td>control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I have no idea how I am feeling</td>
<td>.461</td>
<td>.329</td>
</tr>
<tr>
<td>5. I have difficulty making sense out of my feelings</td>
<td>.643</td>
<td>.219</td>
</tr>
<tr>
<td>9. I am confused about how I feel</td>
<td>.681</td>
<td>.060</td>
</tr>
<tr>
<td>11. When I’m upset, I become angry with myself for feeling that</td>
<td>.688</td>
<td>.008</td>
</tr>
<tr>
<td>way</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. When I’m upset, I become embarrassed for feeling that way</td>
<td>.654</td>
<td>.041</td>
</tr>
<tr>
<td>13. When I’m upset, I have difficulty getting work done</td>
<td>.675</td>
<td>-.314</td>
</tr>
<tr>
<td>14. When I’m upset, I become out of control</td>
<td>.817</td>
<td>.022</td>
</tr>
<tr>
<td>15. When I’m upset, I believe that I will remain that way for a</td>
<td>.780</td>
<td>.058</td>
</tr>
<tr>
<td>long time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. When I’m upset, I believe that I’ll end up feeling very</td>
<td>.761</td>
<td>.075</td>
</tr>
<tr>
<td>depressed</td>
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</tr>
<tr>
<td>18. When I’m upset, I have difficulty focusing on other things</td>
<td>.734</td>
<td>-.266</td>
</tr>
<tr>
<td>19. When I’m upset, I feel out of control</td>
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<tr>
<td>21. When I’m upset, I feel ashamed with myself for feeling that</td>
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</tr>
<tr>
<td>way</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. When I’m upset, I feel like I am weak</td>
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<td>.004</td>
</tr>
<tr>
<td>25. When I’m upset, I feel guilty for feeling that way</td>
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<td>.144</td>
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<tr>
<td>26. When I’m upset, I have difficulty concentrating</td>
<td>.749</td>
<td>-.235</td>
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<tr>
<td>27. When I’m upset, I have difficulty controlling my behaviours</td>
<td>.731</td>
<td>.041</td>
</tr>
<tr>
<td>28. When I’m upset, I believe that there is nothing I can do to</td>
<td>.670</td>
<td>.226</td>
</tr>
<tr>
<td>make myself feel better</td>
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<td></td>
</tr>
<tr>
<td>29. When I’m upset, I become irritated with myself for feeling that</td>
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<td>.010</td>
</tr>
<tr>
<td>way</td>
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<tr>
<td>30. When I’m upset, I start to feel very bad about myself</td>
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<td>.105</td>
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<td>31. When I’m upset, I believe that wallowing in it is all I can do</td>
<td>.659</td>
<td>.184</td>
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<tr>
<td>32. When I’m upset, I lose control over my behaviours</td>
<td>.775</td>
<td>.142</td>
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<td>33. When I’m upset, I have difficulty thinking about anything else</td>
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<td>-.103</td>
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<td>35. When I’m upset, it takes me a long time to feel better</td>
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<tr>
<td>36. When I’m upset, my emotions feel overwhelming</td>
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</table>

*Note: Comp=Component; A=Lack of Emotional Awareness; C=Lack of Emotional Clarity; G=Difficulties Engaging in Goal-Directed Behaviour; S=Limited Access to Emotion Regulation Strategies; I=Impulse Control Difficulties.*
# Appendix G. Study 2 Intercorrelations

**Table G1**

*Study 2 Intercorrelations Matrix for All Variables of Interest*  

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<th>SI-R</th>
<th>SCI</th>
<th>OCI-R</th>
<th>DASS</th>
<th>DERS</th>
<th>UPPS-P</th>
<th>AAQ-II</th>
<th>TAS-20</th>
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<td>Disc</td>
<td>Acq</td>
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<td>.07**</td>
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<td>.07**</td>
<td>.03**</td>
<td>.01**</td>
<td>.03**</td>
<td>.01**</td>
</tr>
</tbody>
</table>

Note: N=178. *** p<.001, ** p<.01, * p<.05 (two-tailed)

SI-R Tot=Savings Inventory Revised Total; Clut=Excessive Clutter; Disc=Difficulty Discarding; Acq=Excessive Acquisition; SCI Tot=Saving Cognitions Inventory Total; EmAtt=Emotional Attachment to Possessions; OCI-NH=Obsessive Compulsive Inventory Revised Non-Hoarding Variable; DASS-21=Depression, Anxiety, and Stress Scales; Dep=Depression; DERS Total (MA)= Difficulties in Emotion Regulation Scale Total Minus Awareness subscale; UPPS-P=UPPS-P Impulsive Behavior Scale; NU=Negative Urgency; PU=Positive Urgency; AAQ-II Total=Acceptance and Action Questionnaire II Total; TAS-20 Total=Toronto Alexithymia Scale 20 Total; DDF=Difficulty Describing Feelings; DIF=Difficulty Identifying Feeling; ERQ=Emotion Regulation Questionnaire; Supp=Expressive Suppression; Reapp=Cognitive Reappraisal.
Appendix H. Study 3 Documentation

H1. Study 3 Ethics Clearance

From: Keith Wilkins
Sent: Friday, 5 April 2013 3:10 PM
To: Maja Nedeljkovic; Jasmine Taylor
Cc: RES Ethics; FLSS Research
Subject: SUHREC Project 2013/036 Ethics Clearance

To: Dr Maja Nedeljkovic/Ms Jasmine Taylor, FLSS

Dear Maja and Jasmine

SUHREC Project 2013/036 A qualitative investigation of emotion regulation in compulsive hoarding
Dr Maja Nedeljkovic, FLSS; Ms Jasmine Taylor et al
Approved Duration: 5/04/2013 To 30/04/2014 [Adjusted]

I refer to the ethical review of the above project protocol by Swinburne's Human Research Ethics Committee (SUHREC). Your responses to the feedback, as per your email of 28 March 2013 with attachment, were put to a SUHREC delegate for consideration. I acknowledge separate receipt of a letter of support for the project from the Director of the Swinburne Psychology Clinic.

I am pleased to advise that, as submitted to date, the project may commence in line with standard on-going ethics clearance conditions here outlined.

- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the National Statement on Ethical Conduct in Human Research and with respect to secure data use, retention and disposal.

- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator/supervisor requires timely notification and SUHREC endorsement.

- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants and any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.

- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project.

- A duly authorised external or internal audit of the project may be undertaken at any time.
Please contact the Research Ethics Office if you have any queries about on-going ethics clearance, citing the SUHREC project number. Copies of clearance emails should be retained as part of project record-keeping.

Best wishes for the project.

Yours sincerely

Keith

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Keith Wilkins
Secretary, SUHREC & Research Ethics Officer

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From: Keith Wilkins
Sent: Thursday, 6 June 2013 6:01 PM
To: Maja Nedeljkovic; Jasmine Taylor
Cc: FLSS Research; RES Ethics
Subject: SUHREC Project 2013/036 Ethics Clearance for Modifications (1)

To: Dr Maja Nedeljkovic/Ms Jasmine Taylor, FLSS

Dear Maja and Jasmine

**SUHREC Project 2013/036 A qualitative investigation of emotion regulation in compulsive hoarding**
Dr Maja Nedeljkovic, FLSS; Ms Jasmine Taylor et al
Approved Duration: 5/04/2013 To 30/04/2014 [Modified June 2013]

I refer to your email today with attached revised consent instruments in light of the Deakin University endorsement of Dr Richard Moulding’s involvement in the above project (DUHREC Ref 2013-139). This clarifying modification was put to the Chair of SUHREC for consideration.

I am pleased to advise that, as modified to date, the project may continue in line with standard on-going ethics clearance conditions previously communicated and reprinted below.

Please contact the Research Ethics Office if you have any queries about on-going ethics clearance, citing the SUHREC project number. Copies of clearance emails should be retained as part of project record-keeping.

As before, best wishes for the project.

Yours sincerely

Keith

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Memorandum
To: Dr Richard Moulding
School of Psychology

From: Deakin University Human Research Ethics Committee (DUHREC)
Date: 05 June, 2013
Subject: 2013-139
A Qualitative Investigation of Emotion Regulation in Compulsive Hoarding
Please quote this project number in all future communications

The application for this project was considered at the DU-HREC meeting held on 17/06/2013.

Approval has been given for Dr Richard Moulding, School of Psychology, to undertake this project from 5/06/2013 to 5/06/2017.

The approval given by the Deakin University Human Research Ethics Committee is given only for the project and for the period as stated in the approval. It is your responsibility to contact the Human Research Ethics Unit immediately should any of the following occur:

- Serious or unexpected adverse effects on the participants
- Any proposed changes in the protocol, including extensions of time.
- Any events which might affect the continuing ethical acceptability of the project.
- The project is discontinued before the expected date of completion.
- Modifications are requested by other HRECs.

In addition you will be required to report on the progress of your project at least once every year and at the conclusion of the project. Failure to report as required will result in suspension of your approval to proceed with the project.

DUHREC may need to audit this project as part of the requirements for monitoring set out in the National Statement on Ethical Conduct in Human Research (2007).

Human Research Ethics Unit
research-ethics@deakin.edu.au
Monday 23 December, 2013 3.59 PM
From: Keith Wilkins
To: Jasmine Taylor; Maja Nedeljkovic
Cc: FLSS Research; RES Ethics

To: Dr Maja Nedeljkovic/Ms Jasmine Taylor, FLSS

Dear Maja and Jasmine

SUHREC Project 2013/036 A qualitative investigation of emotion regulation in compulsive hoarding
Dr Maja Nedeljkovic, FLSS; Ms Jasmine Taylor et al
Approved Duration: 5/04/2013 To 30/04/2014 [Modified June 2013, December 2013]

I refer to your request for clearance of modifications to research participation arrangements as per your email of 17 December 2013 (signed hardcopy version received 19 December 2013). The request was put to the Chair of SUHREC for consideration.

I am pleased to advise that, as modified to date, the project may continue in line with standard on-going ethics clearance conditions previously communicated and reprinted below.

Please contact the Research Ethics Office if you have any queries about on-going ethics clearance, citing the SUHREC project number. Copies of clearance emails should be retained as part of project record-keeping.

As before, best wishes for the project.

Yours sincerely

Keith

---------------------------------------------------------------
Keith Wilkins
Secretary, SUHREC & Research Ethics Officer
Swinburne Research (H68)
Swinburne University of Technology
P O Box 218
HAWTHORN VIC 3122
Tel +61 3 9214 5218
Fax +61 3 9214 5267
From: RSD Research Ethics  
Date: 27 February 2014 14:54  
Subject: 2013-139: A Qualitative Investigation of Emotion Regulation in Compulsive Hoarding  
To: Richard Moulding  

Dear Richard  

Re: 2013-139: A Qualitative Investigation of Emotion Regulation in Compulsive Hoarding  

Thank you for submitting your request for approval of modifications to the above project, previously approved by Swinburne HREC and received on 27 February 2014.  

The modifications relate to:  

1. outsourcing the transcription of the qualitative interviews to a confidential academic transcription service  
2. the Swinburne HREC had approved recruitment of 10 participants from Swinburne’s Compulsive Hoarding and Acquiring Groups. Due to a good response to recruitment it is anticipated that there will end up being 12 participants involved in this study.  

The above modifications have been considered and found to comply with the National Statement on Ethical Conduct in Human Research (2007). They are therefore given approval and the project may proceed in accordance with the original approval granted.  

You are reminded that you must inform Deakin Research Integrity of any complaints received in relation to this project immediately. Details of any complaints should be forwarded to: The Manager, Deakin Research Integrity, Deakin University, 221 Burwood Highway, Burwood Victoria 3125, Telephone: 9251 7129, <research-ethics@deakin.edu.au>.  

Please quote the project ID in any communication with the Committee to avoid delays. All communication should be directed to research-ethics@deakin.edu.au. It is your responsibility to advise the Committee of changes to the research team or changes to contact details.  

If you have any queries in the future, please do not hesitate to contact the Human Ethics Unit. Thank you for keeping the Committee informed.  

Regards  

Chris  

Christine Warne  
Human Research Ethics Administrator  
DR - Integrity, Deakin Research  
Mon-Tue-Thu  
Deakin University  
Locked Bag 20000, Geelong, VIC 3220  
+61 3 92517123  
christine.warne@deakin.edu.au
PARTICIPANT CONSENT INFORMATION STATEMENT AND
CONSENT FORM

H2. Study 3 Consent Information Statement

Project Title:
A Qualitative Investigation of Emotion Regulation in Compulsive Hoarding

Principle Investigators:
Dr Maja Nedeljkovic, Lecturer, Faculty of Life and Social Sciences, Swinburne University of Technology
Ms Jasmine Taylor, Student Investigator, Faculty of Life and Social Sciences, Swinburne University of Technology

Associate Investigators:
Dr Richard Moulding, Lecturer, Faculty of Heath, Deakin University
Prof Michael Kyrios, Director of Brain Sciences Institute & SwinPsyCHE Research Centre

Introduction
The current study aims to contribute to an understanding of the role of emotion regulation in compulsive hoarding. This Consent Information Statement provides you with detailed information on the research project. It explains what participation in this research project will involve, in order to help you decide if you would like to take part. This Consent Information Statement is for you to keep.

Project and researcher interests
The results of this research project will be used by the Student Investigator, Ms Jasmine Taylor in partial completion of her Doctorate in (Clinical) Psychology.

What will participation involve?

Eligibility:
You are eligible to take part in this research project if you:

- Are between 18 – 70 years of age
- Are available and willing to take part in an audio-recorded interview (conducted in English), lasting approximately 1 – 1.5 hours at Swinburne University’s Hawthorn campus
- Consent to the investigators having access to the questionnaires and information you provided during the assessment process for the Compulsive Hoarding and Acquiring Group

Procedures:
If you choose to participate in this study you will be asked to:

- Complete several questionnaires about how you experience and manage your emotions. These questionnaires can be completed at a time and place of your convenience, and may take between 30 – 45 minutes to complete.
• Take part in an informal interview, in which you will have the opportunity to discuss in further detail how you experience and manage your emotions. It is likely that you will be asked about the kinds of emotions you experience, what you do to manage these, and to describe a past emotional experience (of your choosing) in some detail. This interview will be conducted by the Student Investigator, and will take approximately 1 – 1.5 hours. This interview will be audio-recorded and will take place at Swinburne University’s Hawthorn campus.

• Should further information be required after completion of your interview, you may be contacted further regarding this. If you do not wish to be contacted after your participation however you may stipulate this on the Participant Consent Form (below).

What are the possible risks of participating in this research?
The nature of this study is to discuss aspects of your emotional life and hoarding behaviour, which may be upsetting to talk about. The investigators of this research project are aware of this and will endeavour to minimise these risks. If you become upset during your participation, the student investigator will stop interviewing and allow you to decide whether or not you wish to continue with the interview. If you remain distressed after the interview or are concerned about anything that occurred during your participation, the investigators will arrange for appropriate support or counselling.

Can I withdraw from participating in this research project?
It is important that you understand that your participation in this study is voluntary and you are free to discontinue participation at any stage. Your choice to either participate or not participate will have no impact upon your future or current relationships with, or the quality of services provided by, Swinburne University.

What will happen to information about me?
Any information obtained during the course of the study that can identify you will remain confidential, and accessible only to the investigators as named above. All identifying information on records (hardcopy and electronic) obtained during your participation will be removed and replaced with a random code. In any form of publication/presentation, only the group data will be used and no individual’s responses would be identifiable. If interview quotes are published/presented for illustrative purposes, no identifying information or names will be used in those quotes. Data from this study will be securely stored for a period of seven years before being destroyed.

Research output
The results of this study will be used in the Doctoral thesis of the student investigator, and may also be published in an academic journal or presented at academic conferences. Only grouped results would be published and no individual’s responses would be identifiable.

Further information about the project – who to contact
For further information about the project and to arrange an appointment to participate in the research, please do not hesitate to contact either:

Dr Maja Nedeljkovic, Lecturer
Faculty of Life and Social Sciences, Swinburne University of Technology
mnedeljkovic@swin.edu.au, Tel: (03) 9214 4428

Ms Jasmine Taylor, Student Investigator
Faculty of Life and Social Sciences, Swinburne University of Technology
jasminetaylor@swin.edu.au
Where can I go for extra support?
If you feel you would benefit from extra support after participating in this study, please do not hesitate to contact the Swinburne Psychology Clinic for low-cost counselling appointments: Swinburne University Hawthorn Campus, George Swinburne (GS) building, 34 Wakefield Street, Level 4. Tel: (03) 9214 8653.

If you are experiencing a crisis or need urgent help, urgently phone:
Lifeline 13 11 14
Suicide Helpline 1300 651 251

Concerns/complaints about the project – who to contact:

This project has been approved by or on behalf of Swinburne’s Human Research Ethics Committee (SUHREC) and Deakin University Human Research Ethics in line with the National Statement on Ethical Conduct in Human Research. If you have any concerns or complaints about the conduct of this project, you can contact:
Research Ethics Officer, Swinburne Research (H68), Swinburne University of Technology, P O Box 218, HAWTHORN VIC 3122.
Tel (03) 9214 5218 or (03) 9214 5218 or resehthics@swin.edu.au (Project 2013/036)
AND/OR
The Manager, Research Integrity, Deakin University, 221 Burwood Highway, Burwood Victoria 3125,
Tel: (03) 9251 7129 or research-ethics@deakin.edu.au (Project ID: 2013-139)
H3. Study 3 Consent Form

**Project Title:**
A Qualitative Investigation of Emotion Regulation in Compulsive Hoarding

**Principle Investigators:**
Dr Maja Nedeljkovic, Lecturer, Faculty of Life and Social Sciences, Swinburne University of Technology
Ms Jasmine Taylor, Student Investigator, Faculty of Life and Social Sciences, Swinburne University of Technology

**Associate Investigators:**
Dr Richard Moulding, Lecturer, Faculty of Health, Deakin University
Prof Michael Kyrios, Director of Brain Sciences Institute & SwinPsyCHE Research Centre

In relation to this research study, please circle your response to the following:

- I agree to be interviewed by the student investigator  
  Yes  No
- I agree to my interview being audio-recorded by electronic device  
  Yes  No
- I agree to complete questionnaires asking me about my emotions  
  Yes  No
- I agree to allow the investigators access to the information obtained about me during the assessment process for the Compulsive Hoarding & Acquiring Group  
  Yes  No
- I agree to make myself available for further information if required  
  Yes  No

I acknowledge that:

(a) my participation is voluntary and that I am free to withdraw from the project at any time without explanation;
(b) any identifiable information about me which is gathered in the course of and as the result of my participating in this project will be (i) collected and retained for the purpose of this project and (ii) only accessed and analysed by the investigator(s) for the purpose of conducting this project;
(c) my anonymity is preserved and I will not be identified in publications or otherwise without my express written consent.

By signing this document I agree to participate in this project.

Name of Participant: ........................................................................................................

Signature & Date: .................................................................................................