

Compulsive Hoarding: A Site-Security Model and Associated Psychological Treatment Strategies

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Compulsive hoarding presents a challenge to researchers and therapists in terms of conceptualization/engagement in treatment/associated intervention outcomes and is generally identified as an unresolved clinical challenge. Although a wide range of factors associated with human compulsive hoarding have relatively recently begun to emerge, subsequent theorizing has tended to ignore the vast amount of extant animal evidence available. This study identifies a key biological theory of hoarding (the security hypothesis) and attempts to apply its assumptions and concepts to human hoarding. As a result, human hoarding is recognized as a possible form of site-secure larder hoarding, which is observed in a huge variety of other species. The manifestations of hoarding are related to secure site behaviours in humans, with the possible prior selective advantage of hoarding expounded with reference to the current maladaptive behaviours associated with creating and maintaining secure sites. A division is identified between the 'micro' behavioural maintaining factors of hoarding and the 'macro' outcome distress variables. The psychological treatment implications of a secure site conceptualization of compulsive hoarding are identified and detailed in each section, with particular reference to 'just in case' hoarding cognitions. The development of the site-security model enables study hypotheses to be set regarding hoarding behaviours, that can be empirically addressed in future research. Copyright © 2007 John Wiley & Sons, Ltd.

INTRODUCTION

Hoarding is a perplexing and unique mental-health problem in that, unlike any other psychopathology, the signs and symptoms that primarily comprise the disorder are almost purely environmental. The boundaries of the hoarder's home provide the context within which the person's psychological difficulties are exhibited, in the form of environmental chaos and clutter (Greenberg, 1987). In terms of evidence of response

to intervention, whether it be pharmacological, psychological or mixed interventions, compulsive hoarding is considered a largely treatment refractory disorder (Frost, Steketee, & Greene, 2003; Grisham & Barlow, 2005; Saxena & Maidment, 2004). This paper examines compulsive hoarding from a position that integrates the existing foremost animal model with that of the extant human psychological empirical evidence, in the service of developing new psychological treatment strategies. The theory underlying the current analysis is that hoarding may actually be better understood as the activation of previously adaptive strategies: the conservation and control of material resources.

Previous analyses of hoarding have tended to only pay lip service to the manner in which evolutionary pressures may have shaped the develop-

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ment and retention of hoarding behaviours. Rapoport (1989) likened hoarding to an instinctively driven nesting behaviour, while Blurton-Jones (1988) proposed hoarding as survival instinct, one that represented an aspect of the natural ecology of human behaviour. Otherwise, hoarding tends to be viewed either solely through the lens of biological (see, for example, Stern & Passingham, 1994) or cognitive-behavioural models (see, for example, Frost & Hartl, 1996), with scant regard for the role of distal natural and sexual selection pressures in hoarding presentations. Akhtar (2003) states that psychoanalysis has paid wholly inadequate attention to the role and significance of inanimate objects in psychopathology.

Hoarding behaviours have been recorded at high frequencies in a wide range of non-clinical samples such as student, community controls and older adults (Frost & Gross, 1993; Frost, Hartl, Christian, & Williams, 1995; Frost, Steketee, & Williams, 2000; Frost et al., 1998; Steketee, Frost, & Kim, 2001). Hoarding is also observed in 20–30% of obsessive-compulsive disorder (OCD) sufferers (Frost, Krause, & Steketee, 2002; Leckman et al., 1997; Samuels et al., 2002). The frequency of collecting and hoarding in such populations at clinical and non-clinical levels indicates that there is likely to have been some positive selection for genes mediating the behavioural traits of retention and control of material resources in the past. Indeed, in the present day, at times of some form of local or national resource-supply crisis, such as a drought or possible short-term limitation in the food supply, then hoarding and stock piling type behaviours across many people are observed; people who typically do not engage in such behaviours under stable environmental conditions. The potential threat of an 'energy crisis' to the biological system (Vander Wall, 1990) appears to stimulate the anxiety 'not having' possessions perceived as key to survival, with Neziroglu, Bublrick, and Yaryura-Tobias (2004) relating such behaviours to a 'primal fear' of deprivation/starvation.

The biological literature is replete with examples of hoarding type behaviours across a huge spectrum of species (Vander Wall, 1990). The variety, frequency and form of such hoarding behaviours would indicate a broad selective advantage for exerting control over internal needs/demands (e.g., biological necessities such as calorific intake) and/or external environments (e.g., season, predator and/or light/dark), through the manipulation of material resources. When humans (Keys, Brozek, & Henschel, 1950) and animals (Cabanac &

Swiergiel, 1989) have been experimentally starved, hoarding behaviours of both calorie resources and objects quickly emerged. The management and manipulation of possessions and information about key resource acquisition and its subsequent control have been viewed as critical and central features of human evolution (Kurland & Beckerman, 1985). However, the complex cognitive adaptations that are likely to have taken place to enable hoarding to have emerged in the Pleistocene era or earlier have subsequently been maintained by phylogenetic inertia, long after the selective conditions favouring hoarding have disappeared (Smith, 2000). Hoarding may involve the control and conservation response within the present-day context of evolutionary novel conditions (e.g., often unlimited resource availability), using cognitive mechanisms adapted to prior environments of evolutionary adaptiveness (i.e., foraging for limited and energy-sapping, hard-to-access food/shelter supplies). Hoarding appears especially maladaptive in the current Western world's novel evolutionary conditions of living in a time of 'plenty'. Axelrod and Hamilton (1981) would recognize hoarding as particularly adaptive among Pleistocene hunter-gatherers, who had the ecological conditions favouring delayed reciprocity of, for example, the spoils of a hunting trip, and small group interactions stabilizing hoarding against free-riding opportunists.

Taxometric Issues

The word taxon is used across the sciences to imply a type, natural category or non-arbitrary class (Meehl, 1992). Taxa do not signify unspecified ranges on the upper tails of continuous distributions (such as, for example, *obese* or *extrovert*), but rather distinguish the crucial and fundamental features that enable accurate classification. Phenomenological research has consistently indicated hoarding to be separate from, but related to, obsessive-compulsive disorder, with factor analytic designs persistently identifying hoarding as a distinct and discrete symptom cluster (Cavallini, Di Bella, Siliprandi, Malchiodi, & Bellodi, 2002; Leckman et al., 1997; Summerfeldt, Richter, Anthony, & Swinson, 1999). Some researchers have called for hoarding to be therefore recognized as a symptomatically (Greenberg, 1987) and biologically (Black et al., 1998) distinct version of OCD; yet at the present time, compulsive hoarding is not formally recognized as a psychiatric diagnosis (Steketee & Frost, 2003). Hoarding is specified as a

symptom in obsessive-compulsive personality disorder (DSM-IV, American Psychiatric Association, 1994), yet only low percentages of hoarders have been illustrated to meet the OCPD criteria (Samuels et al., 2002; Winsburg, Cassic, & Koran, 1999).

A consensus has emerged between researchers and clinicians, on the presence of the factors indicating compulsive hoarding: (a) the acquisition and failure to discard objects that appear to no longer serve any useful, practical or constructive purpose; (b) the efficacy of living spaces being significantly compromised as a result; and (c) significant distress being reported by the person (Frost & Hartl, 1996). Three factors differentiate hoarders from those people who tend to collect objects around a certain theme or interest (Steketee & Frost, 2003). First, collecting is defined by a sense of pride in a core subject matter (Baekeland, 1981; Neziroglu et al., 2004), whereas hoarding is defined by its distinct lack of organization, structure and rationale. The degree to which hoarders experience 'shame' is an unmet research need, but may provide an additional reason for treatment refusal due to issues of concealment (Gilbert & McGuire, 1998). Second, compulsive acquisition has been illustrated to also play a significant role in hoarding, and not collecting, with the acquisition and retention of an undifferentiated range of 'free' objects such as promotional materials or discarded items (Frost et al., 1998). Indeed, hoarding has been described as a psychopathology of acquisition (Steketee & Frost, 2003) and therefore, examples of the acquisition and associated hoarding of domiciliary pets are also available (Arluke, Frost, Luke, & Messner, 2002; Beeler, 2003; Patronek, 1999). Finally, unlike 'collectors', the homes of hoarders are distinguished by high levels of disorganization, wherein highly valued objects (including money) are mixed in with an overwhelming plethora and abundance of other acquired objects (Frost & Steketee, 1999). This can lead to the situation in extreme cases of narrow corridors existing within rooms, limiting access and utility, with all other space occupied by undifferentiated clutter (Neziroglu et al., 2004), creating acute and ongoing health and safety risks (Thomas, 1997).

The issue of associated distress (factor c) is interestingly in hoarding, regarding apparent conflicts between ego-syntonic and ego-dystonic aspects of hoarding behaviours. The current site-security model proposes a marked distinction between maintaining micro-behavioural aspects of hoarding and the macro-personal impact of the associated environmental chaos. Hoarders tend not to

perceive the 'micro' aspects of their behaviour (e.g., the retention of a defunct timetable) as unusual in the slightest (Black et al., 1998; Frost, Steketee, & Williams, 2000). Micro aspects of hoarding behaviour are perceived as completely rational by hoarders, which in itself is unusual for OCD (Salkovskis, 1985). This may account for the low levels of associated help seeking in hoarders (Black et al., 1998). In terms of therapy with hoarders, as with other ego-syntonic disorders, then it is vital to understand and operate from the hoarders' psychological frame of reference (Vitousek, Watson, & Wilson, 1998). In short, to appreciate that although it may be (in reality), be a paper cup, for example, that the hoarder is agonizing over; it represents a potent symbol of psychological safety for the hoarding client. Frost et al. (2003) state that if hoarders are initially unable to consider discard during the early stages of treatment, then a lower intervention point on the hierarchy may be the organizing of possessions prior to the consideration of discard.

Other family members, friends and/or carers may be the people to experience the macro-emotional distress of the micro-behavioural aspects of hoarding (Steketee, Frost, Wincze, Greene, & Douglass, 2000; Wilbram, Kellett, & Beail, 2007). The macro-impact of hoarding, for example, the gross levels of clutter and inability to domestically function, appear largely ego-dystonic and would account for the associated distress reported by hoarders, such as reported levels of co-morbid depression (Steketee et al., 2000). Distress in hoarding appears to peak when clutter compromises the efficacy of the living space due to issues of infestation, which subsequently entails service intervention and associated emotional turmoil due to threat of removal of cherished objects (Amdur, 2005). The obvious distress created by such (often very necessary) interventions would be understood in the current analysis as a gross infringement to previously rigorously maintained psychological site-security procedures. Frost et al. (2003) state that hoarding specific psychoeducation is useful in terms of alerting clients to the effects of hoarding on general functioning, therefore enabling better cooperation with treatment procedures.

FORMS OF HOARDING: HUMAN AND ANIMAL EVIDENCE AND THE EXCLUSIVE RESOURCE HYPOTHESIS

Within the biological literature there is an ontological schism between that of 'scatter' hoarders and 'larder' hoarders. Scatter hoarding (a term coined

by Morris, 1962) describes the storage of items of food by species for later consumption or relocation across a geographical area, while larder hoarders store items at single or closely related sites (Vander Wall, 1990). Scatter and larder hoarding can be rigorously distinguished by the observation of a single behavioural criterion. Scatter hoarders make a single visit to a site when placing a stored item (thereafter relying heavily on spatial memory for future utility; Vander Wall & Jenkins, 2003), while larder hoarders make repetitive and stereotyped site visits during the preparation and maintenance of stores. In human hoarding, a room in a home, or more frequently the entire house itself, forms a receptacle boundary store for the hoarder (Damecour & Charron, 1998). The human form of hoarding would appear to share many behavioural commonalities with larder hoarding in other species (Vander Wall, personal communication, 15 5, 2001), with scatter hoarding in humans ubiquitous by its apparent absence. Neziroglu et al. (2004) noted that humans can also strive to expand secure sites into basements, attics, garages and sheds, with occasionally other homes being purchased to store and guard objects when the original secure site is full. Identifying the scale of the secure site is a primary assessment task prior to therapy. To apply the word 'larder' to human hoarding can be slightly misleading, as human hoarding entails the retention of many objects beyond that of simple food items. However, the psychological mechanisms underlying larder hoarding across species appear similar, in that the behaviour appears primarily motivated by the development and maintenance of a secure site, within which valued objects provide a key source of psychological security. Communal larder hoarding is widespread for numerous social species in which groups are formed of close kin (Vander Wall, 1990), with early human development containing similar examples of such small groups, based on

close kin acting as integrated social units, as a basic prerequisite for survival (Bailey, 1997; Bailey & Wood, 1998; Barchas, 1986). Food stores in other species are focal points for social activities and social organization (Stacey & Ligon, 1987). Kinship appears a true species universal (Fox, 1994), which would simultaneously allow for the evolution of hoarding through the actions of kin selection and reciprocity (Mumme & de Queiroz, 1985).

In terms of the motivation to develop and maintain a secure site, Furby (1978) described several characteristics of objects that stimulate the desire to hoard in humans. The characteristics of these differing forms of objects and associated types of hoarding can also be observed in animal studies. The common underlying factor that appears to bind the differing forms of hoarding together across the species is that once an object is perceived as an '*exclusive resource*' (i.e., it is assigned some form or degree of importance and/or value; Vander Wall, 1990), then hoarding type behaviours are likely to follow. Table 1 illustrates the variety of forms of human hoarding in terms of example possessions and the exclusive resource potential offered by such objects. The differing forms of human hoarding will now be analysed with reference to the exclusive resource hypothesis.

First, in humans, objects can be perceived as possessing some precise practical value and have a designated proximal or distal usage aim—termed instrumental hoarding (Furby, 1978). The exclusive resource provided by such an object is the potential utility to the person of continuing to control/own that object and the psychological threat posed by the potential loss of such a resource. In human hoarding, the collection and control of information is a common theme (Frost & Gross, 1993), with information-containing objects (old magazine, for example, being the exclusive resource) needing to be retained to avoid the antic-

Table 1. Exclusive resource potential offered by possessions

Form of hoarding	Example object	Exclusive resource potentiality	Behavioural consequences
Instrumental hoarding	Old newspaper	Source of records, information and history	Conserve and control on site
Intrinsic hoarding	Unusual ornament	Icon of distinctiveness, uniqueness and separateness	Conserve and control on site
Sentimental hoarding	Old pair of trousers	Signal for associated affect and memories	Conserve and control on site

ipated catastrophic feared loss of information that discard would entail (Neziroglu et al., 2004). Instrumental aspects of information for hoarders do not appear to be affected by the passage of time, with information rarely becoming defunct, dated or superseded. Frost and Hartl (1996) describe that hoarders are 'convinced' of the importance of recalling each and every aspect of each and every possession (i.e., not only all the information a town guide contains; but also the context of buying it; the company, the weather, the life circumstance etc). The decision to discard the instrumental object is therefore deferred, as the cost-anxiety of discard outweighs the advantage of less clutter at the secure site. As such, the site would feel far less secure to the hoarder should he or she feel that vital instrumental information was constantly haemorrhaging from the site, due to the perceived casual or slapdash discard of such valued informational resources. Treatment implications therefore entail engaging the hoarder in understanding that their fears are based on the possibility of losing instrumental *information* rather than the object itself. This also provides subsequent therapeutic opportunities for assessing whether objects do actually contain relevant information or not.

Hoarding in other species can be primarily defined as the handling of an object (typically, but not exclusively, food) to defer it for future usage (Vander Wall, 1990). Proposed deferment appears the key similarity for instrumental hoarding across species, with Neziroglu et al. (2004) stating fears of running out of an item or a fear of needing it later being a key motivator for hoarding. Smith (1990) noted that visual cues often stimulated hoarding behaviour, due to species being aware of the possible proximal or distal threat of not maintaining control of objects. Having objects in sight is a commonly reported motivation in humans (Frost & Hartl, 1996). Hoarders only connect with the anticipated fear of loss of the exclusive resource once the object is retrieved and differentiated from the gross levels of clutter that, by definition, obscures separate and individuated items (Frost & Hartl, 1996; Frost & Steketee, 1999). As the possession is perceived and handled, then the object becomes separate and individuated once more and acquires the aura of an exclusive resource, singled out from the mass of clutter, inevitably creating the motivation to retain. In terms of the range of objects capable of holding unique information, then the form of the actual information can be very precise (e.g., a recipe or a theatre review) and unrepeated elsewhere, again stimulating the perception

of the object as an inimitable, single and therefore exclusive resource.

Second, objects can be perceived as possessing a value or meaning, although they hold no practical purpose—termed intrinsic hoarding (Furby, 1978). Objects in intrinsic hoarding are held as personifying virtues of 'perfection'. Thus, an object can be seen to be simply too pretty/cute, perfect/faultless or unusual/curious to throw away (Kyrios, Frost, & Steketee, 2004). The potent exclusive resource perception prompted by such objects is the lack of evidence of replication elsewhere; the object is immediately perceived as strongly and perhaps perfectly individuated from any genre. Several lines of animal research have revealed a similar preferences for objects that appear to hold no practical purpose whatsoever to the organism. Wallace (1978) noted that the hoarding of inedible objects by laboratory mice was strongly influenced by the novelty of the objects, and later noted (Wallace, 1983) that the incentive visual and tactile properties of inedible objects appeared crucial in a wide range of animal hoarding behaviours. In the example of laboratory rats (Wallace, 1978), the hoarding of inedible objects appears to be acted upon by the influence of two factors: novelty and partibility (objects existing in carryable units). Human hoarding is not distinguished by the aggregation of a limited number of items (i.e., collecting; Baekeland, 1981), but rather by the combined effect of the acquisition and failure to discard of a myriad of usually small items easily acquired (Frost et al., 1998), easily transported and easily stored. Clutter is accumulated, resulting in 'cherished' items tending to be heaped into formless piles (Frost & Hartl, 1996; Frost & Steketee, 1998). Neziroglu et al. (2004) note that due to the ability of hoarders to attach meaning to objects, virtually any possession can be given a 'unique' status, opening the possibility for widespread intrinsic hoarding. The aim of psychological treatment is therefore to enable hoarders to differentiate and identify those objects that truly hold some form of exclusive resource and are required to be retained, versus objects that are prematurely/falsely granted some form of inflated/unhelpful exclusive resource potential.

The final form of human hoarding is that of sentimental hoarding (Furby, 1978), whereby an affective attachment is formed to an object, causing it to be retained. Kellett and Knight (2003) proposed that sentimental hoarding is created through the operation of the specific cognitive distortion of 'object-affect fusion', whereby affect is 'projected' into objects rather than owned and contained by the

Table 2. Identifying and challenging exclusive resource assumptions

Defining exclusive resource	Exclusive resource assumption	Key cognitive challenges
Possessions perceived instrumental value	<i>'If there comes a day when I need this, then I don't want to be caught short'.</i>	<i>'How many of these do I actually need?' 'Does it still work and will it work in the future?' 'Will I truly need this?' 'Do I have a plan to use this?'</i>
Possession perceived intrinsic value	<i>'If I were to ever throw this away . . . then I would not be able ever to replace it, its unique'.</i>	<i>'How many things do I have, that I also think like this about?' 'What would be so bad about not having this object?' 'Is any mass produced possession truly unique?'</i>
Possessions perceived sentimental value	<i>'If this reminds me of the time when . . . then I need to keep it.'</i>	<i>'I don't need to protect my possessions; I'm assuming that they have feelings.' 'I hold my memories, my objects don't.'</i>

individual, creating inevitable behavioural avoidance at the point of discard. Objects hold an exclusive resource status in the mind of the hoarder, as they contain specific and highly individuated affect-laden memories for that individual (Frost & Steketee, 1998). Kellett (2006) illustrated the expression of affect associated with possessions as an initial step in facilitating behavioural exposure to discard. Examples of sentimental hoarding are absent from the animal literature due to other species obviously being unable to report on such complex psychoemotional processes. However, Licklider & Licklider (1950) concluded that *'the factors that lead to hoarding and that determine what is hoarded are by no means entirely alimentary. The initiation of hoarding seems to be for the rat, as for the human, a complex motivational problem to which sensory and perceptual factors, rather than blood chemistry, seem to hold the key'* (Licklider & Licklider, 1950).

In human hoarding, due to the high levels of acquisition associated with hoarding (Frost et al., 1998), hoarders appear to see potential for an object providing instrumental, intrinsic or sentimental resources and appear to experience an emotional transfer of ownership of exclusive resource at the point of acquisition. Once an object is acquired due to its being an exclusive resource of some sort to the hoarder, then it is acquired for that period in which it remains capable of fulfilling exclusive resource functions, which appears typically unspecified in hoarding. Objects can continue to fulfil the exclusive resource anxiety *ad infinitum* for the hoarder, as long as the cognitions underpinning the resource potential of the object remain unchallenged. The aim of psychological treatment therefore is to engage the hoarder in a therapeutic relationship in which they are encouraged to reflect upon and challenge their assumptions regarding

objects' exclusive resource potential. Frost et al. (2003) encourage individually tailoring hoarding thought record keeping and restructuring, due to the often idiosyncratic nature of hoarding beliefs. The current paper suggests that although hoarding beliefs may be idiosyncratic, a commonality is the exclusive resource potential offered by possessions. Table 2 contains examples of hoarding exclusive resource assumptions and possible means of challenging such assumptions.

The impact of some sort of deprivation leading to hoarding across species (such as nutritional deprivation) may not be the simple, direct and causal relationship it intuitively appears, but rather one that contains factors such as the manner in which deprivation acts upon and alters the organisms' perception of the exclusive resource. Similarly, in humans, the failure to meet a developmental need in childhood (be it material and/or maternal deprivation or other such form of stressor) creates the conditions for changing the manner in which possessions are in turn perceived and related to. Possessions held within a secure site appear to provide a potent source of psychological security for the individual. As Vander Wall (1990) stated, *'the genetic endowment or an organism, as well as its experience during formative stages of behavioural development, determines to a large degree its disposition to hoard as an adult'*. Frost and Gross (1993) indicated in humans that the age of onset for hoarding occurs most often in childhood or early adolescence, with the condition then running a chronic course that tends to actually worsen over time (Grisham, Frost, Steketee, Kim, & Hood, 2003). The etiological role played by childhood developmental factors in human hoarding are yet to be rigorously expounded; however, it is highly likely that the potential for displaying

hoarding behaviours is activated by adverse and traumatic childhood events, which are likely to disturb crucial attachment relationships. The role of maternal deprivation has been emphasized (see Adams [1973] for example), with Shafron and Tallis (1996) reporting consistent themes in a series of hoarding case studies of emotional and maternal deprivation and significant loss during childhood and adolescence. Hartl, Duffany, Allen, Steketee, and Frost (2005) compared hoarders and controls in terms of their trauma histories; hoarders reported a significantly greater number of differing types of traumas and more frequent traumatic experiences. In terms of treatment, Akhtar (2003) emphasizes understanding the manner in which possessions can operate as 'linking objects' to previous losses, as the emotional significance of such objects tends not to reduce over time in hoarding.

MOTIVATION TO HOARD: *THE SECURE-SITE HYPOTHESIS*

Hoarding has evolved in many taxa many times (Vander Wall, 1990), which suggests that the proximate steps leading to larder hoarding may take a wide diversity of forms across species with a common evolutionary past (Stevens & Price, 1996). Fossil and sub-fossil data suggests evidence of such larder hoards (Voorhies, 1974). The aim of this section is to provide a unifying hypothesis that may account for larder hoarding and to specify the selective pressures creating hoarding behaviours across species. The unifying hypothesis is provided by the ubiquitous roles of safety and security across species (Nesse, 1998). Bindra (1948) first speculated on the security hypothesis, maintaining that the areas wherein species were forced to forage provided far greater sources of potential threat, in comparison to a secure site enabling and facilitating sleep, food intake, rest and opportunities to reproduce. Organisms are obviously more prone to predation in certain areas or while carrying out certain behaviours or tasks. Virtually every small mammal takes food to a refuge at the slightest hint of a threat to safety (Vander Wall, 1990). To minimize risk from harm, or alternatively to maximize perceptions of security, species return to a refuge to eat and store food items that they have garnered. Items deposited at secure sites can be revisited during times of threat or when own predation tactics are likely to be poor (e.g., nighttime/winter/foraging for mate/offspring). If the items left at the secure site are sufficient to increase

the general fitness of the site owner, then behaviours that increase the amount of items hoarded and also protect the associated hoarded items are highly likely to be positively selected for over time (Vander Wall, 2003).

The capacity to defend important resources for survival or fitness, as in the case of a larder hoard, nest, territory or 'status', has been referred to as Resource Holding Potential (RHP) (Parker, 1974; Price, 1988). Obviously, to be able to effectively form a larder or secure site and to be successful in defending such a site against pilferage would be a potent signal of high RHP, whereas poor site defence would be indicative of low RHP. The overt behaviour exhibited by animals when defending resources or challenging for other resources is termed Ritual Agonistic Behaviour (RAB) (Archer, 1988) and contains aspects such as aggression, intimidation, display and territoriality (Dixon, 1998). Animals exclude potential competitors from their territory or area around their cache, via RAB, to lower the probability of pilferage (Jones, 1993). RAB appears as the behavioural shorthand exchanged between and within species to assess and respond to RHP. The requirement for a secure feeding site via exhibits of RAB may have set conditions favourable for the evolution of eventual hoarding, due to such behaviours being potent and unambiguous environmental signals of RHP selected for via sexual selection pressures.

Once a larder hoard is accumulated, it is obviously catastrophic in terms of the organism for the larder to be compromised in any way or manner, with physical survival being the ultimate price paid; no genes being passed onto the next generation (Wauters, Suhonen, & Dhont, 1995). Neziroglu et al. (2004) conceptualize hoarding in humans as an effort to constantly prepare for, and the attempt to avoid, imagined future catastrophe. The aim of treatment therefore is to enable the hoarder to specify the form and content of the catastrophe they anticipate and to enable the hoarder to consider whether (a) such a catastrophe is actually likely and (b) whether a particular object would actually prevent the imagined catastrophe from occurring. Aggressive defence of stores is common and a mortal necessity in larder hoarders (Vander Wall & Jenkins, 2003). Aggressive defence appears also related to issues of rank and RHP. For example, Brodin (1994) illustrated that dominant male tits cache in the tops of trees and aggressively exclude subordinate males who are subsequently demoted to the lower reaches of the same trees

(where they are presumably more prone to predation and pilferage). Submissive adaptive hoarding behaviours are also apparent. Low-social ranking Barbados green monkeys actually conceal resources to prevent pilferage by the more dominant members of the social group (Baulu, Rossi, & Horrocks, 1980). In short, if the larder is not effectively defended, when and if pilferage should occur, it is likely to be extremely detrimental to the hoarder's chances of passing genes into the next generation (Vander Wall & Jenkins, 2003).

Such aggressive strategies and displays appear to have been largely replaced over evolutionary time in humans with other social behaviours (Gilbert & McGuire, 1998), with hoarders responding to threats to site security with anxious rather than aggressive responses. Despite the 'micro' aspects of hoarding behaviour being ego-syntonic, it appears that the 'macro' results are associated with, in particular, social phobia (Frost et al., 2000; Samuels et al., 2002; Steketee et al., 2000). The co-morbidity of hoarding and social phobia could be accounted for in the current analysis by hoarders tending to ensure feelings of site-security by means of being typically present at the site. Although such behaviours create perceptions of site-security for the hoarder, it may also provide the conditions for associating leaving the site, with feelings of vulnerability to pilferage etc. and, in turn, the conditions for observed levels of schizotypy, social withdraw and restricted social networks (Kaplan & Hollander, 2004; Steketee et al., 2001). The co-morbidity of hoarding and social phobia via site-security mechanisms may also partially account for the low rate of marriage recorded in chronic hoarders in both community and clinical samples (Frost & Gross, 1993; Samuels et al., 2002; Steketee et al., 2001). Presumably, during the evolutionary development of hoarding, the behaviour did not operate as a detriment to genetic transmission due to the ability to control and conserve environmental resources being positively sexually selected for at that time. Akhtar (2003) equates protection of objects as actually 'protection of the self.' As hoarders assume great responsibility for their possessions (Frost & Steketee, 1999), then to leave the site is to, for example, abandon the cherished range of objects within to exposure to potential harm from intruders. In terms of treatment implications, Akhtar (2003) emphasized that therapists encourage any efforts the hoarder makes in 'individuating-separating' him or herself from his or her physical environment. Behaviourally, this may be achieved by spending more time outside of the home in order

to reduce the degree of 'fusion' between the hoarder and his or her possessions.

The peril of pilferage from a hoard seems to contain aspects of both social and non-social security threats (Marks & Nesse, 1994). Loss of a cache in terms of a social threat represents the awareness within the group that the organism is not capable of an effective defence of its territory, signifying low RHP and poor associated sexual selection. Loss of a cache in relation to a non-social threat is represented through the loss of possessions and physical insecurity and anxiety this may impose. Food envy, a nearly universal trait of higher vertebrates (Vander Wall, 1990), results in animals protecting stores even when satiated, presumably due to the social RHP threats imposed by any submissive acceptance behaviours. Gilbert (1998) suggested that evaluations of psychological/physical safety and security across species tend to operate on a 'better safe than sorry' rule in relation to both non-social and social threats and are processed through 'fast-track' mental processes. Kyrios et al. (2004) emphasized that contact with possessions for compulsive hoarders triggers a narrowing of perception, attention and general cognitive functioning, indicating the presence of such fast-track safety and security-focused mental processing. Amdur (2005) noted that hoarders tended to only be free from anxiety (i.e., in the current context, 'site-secure') when surrounded by their possessions, when presumably anxiety eliciting fast-track anxious mental processing is circumvented by cognitive, affective and behavioural avoidance (Frost & Hartl, 1996). The degree, however, to which any hoarder could ever be truly 'site-secure' is compromised by levels of extreme ruminative doubting (Rasmussen & Eisen, 1992). As such, the task of hoarding is never complete due to chronic ruminative doubt imposing severe limits on the degree to which the hoarder can make final and conclusive decisions regarding the 'micro' relationship to hoarded objects (Warren & Ostrom, 1988). Both chronic acquisition and chronic hoarding appear straddled by the anxiety of 'not having' exclusive ownership and control of objects, with the 'micro' behaviour of hoarding being driven by the avoidance of negative emotional states (Steketee & Frost, 2003).

Typical regulation behaviours dictate that a 'well-stocked' larder curtails further collection/retention of items, and vice versa, an empty larder prompts foraging/hoarding type behaviours. In short, visual, tactile or (more presumably more rarely in humans) olfactory contact between the

organism and the status of its larder/secure site *should* form a feedback loop, which either inhibits or motivates further exclusive resource acquisition. In the biological arena, the inhibitory effect of full larders has not been extensively studied (Vander Wall, 1990), although the available evidence suggests that the size of the larder bears no relationship (either inhibitory or stimulatory) on further hoarding (Ewer, 1968). An animal may hoard food until the supply has run out, with extra resources gathered presumably acting as 'energy insurance' against potential environmental vagaries and threats. Similarly, in the case of human hoarders, the normal feedback mechanism provided by hoarding regulation efforts (e.g., 'I have enough examples of that now' or 'I can't imagine needing this again' or 'I can't move in this room for all my stuff') appears to be either overridden or play no active role in actual decision making related to objects. Site-security regulation efforts appear to be sabotaged or overridden by the prevalence of chronic doubt and indecision (Rasmussen & Eisen, 1992) in relation to the 'micro' management of hoarded objects. Ryle (1990) would conceptualize such a lack of effective self-regulation in terms of compulsive hoarding as evidence of a faulty 'procedural sequence', whereby 'neurotic' processes ('snags, traps and dilemmas') override and sabotage the hoarders' ability to learn how to discard. A hoarding snag might be giving up on efforts to clear spaces due to the scale of the clutter, a hoarding trap might be where the inability to discard reinforces hoarding beliefs/assumptions and a hoarding dilemma might be when the hoarder believes that he or she must *either* live in a markedly cluttered space *or* a totally clear space.

In terms of behavioural treatment of indecision in hoarding, Frost and Steketee (1998) emphasize the utility of the OHIO acronym of 'Only Hold It Once', meaning that clients are required to make a decision concerning targeted objects rather than delaying such decisions indefinitely. The upper limits of hoarding do not appear to be set by normal environmental feedback mechanisms, but rather by the ability/capacity to store objects (i.e., the size of house) due to the inexhaustible supply of objects/artefacts/possessions/information sources available to acquire and the complex relationships formed with such possessions (Kellett, 2006; Kellett & Knight, 2003). In modern life, the degree of unsolicited information provided to people each day provides an interminable supply of objects containing information likely to create anxiety in the hoarder unless retained for future decision making

regarding retention or discard. Such decisions are subsequently unerringly and characteristically cognitively and behaviourally avoided (Frost & Hartl, 1996). As larder-hoarding organisms behave in a manner to provide and ensure 'energy insurance' in relation to the contents of their secure site, then the human hoarder acts in a manner to provide 'anxiety insurance' against the decision or action of mistaken discard. In terms of treatment, Neziroglu et al. (2004) advise employing three boxes during behavioural exposure exercises to facilitate decision making: a save box, a discard box and a redeploy box (for items to be put back where they belong).

CHARACTERISTICS OF HOARDING IN LIGHT OF THE SECURITY HYPOTHESIS

Now that human hoarding has been re-conceptualized and identified as containing a range of secure-site behaviours akin to larder hoarding in other species, it is possible to reanalyse the characteristics of human hoarding via the security hypothesis. An archetypal feature of hoarding is the sense of overwhelming and possibly perpetual emotional loss anticipated or experienced at the point of discard (Warren & Ostrom, 1988). Such losses obviously present a major source of threat to perceived security, with the hoarder opting for the safety of continuing to own and control possessions rather than the dread of, or actual experience of, losses to ownership or tenure (i.e., 'I'll keep this news paper and the information it contains; after all I can't get it back if I throw it away'). Table 3 describes the categories of human hoarding (Furby, 1978) using the security hypothesis.

It appears that ubiquitous across intrinsic, instrumental and sentimental hoarding is the insecurity of making what is perceived by the hoarder as at least a very costly blunder concerning the rejection or discard of a cherished object or possession (Warren & Ostrom, 1988). The high levels of indecisiveness evident in hoarding (Frost & Shows, 1993) functions to maintain avoidance of object-focused decision making. Such avoidance creates an illusory and temporary but nevertheless palpable and experienced sense of site-security in the hoarder. The treatment implications of such indecisiveness entail engaging hoarders in considering the balance between the short-term micro-maintaining factors and the long-term macro-consequences. Such indecisiveness causes more impairment in the long-term (i.e., compromised living spaces, poor relationships etc.)

Table 3. Types of hoarding and proposed threats to security

Type of hoarding	Threat to security	Example cognition	Behaviour
Instrumental hoarding	Loss of possible future utility	<i>'What if I really need one of these?'</i>	Indecisive and avoidant
Intrinsic hoarding	Loss of pleasure of ownership	<i>'Its such a perfect example of x; how could I possibly throw it away?'</i>	Indecisive and avoidant
Sentimental hoarding	Loss of affect associated with object	<i>'If I threw out that shirt, it would be like rejecting my child who wore it'</i>	Indecisive and avoidant

Table 4. Treating hoarding indecision

Example of hoarding indecision	Indecision challenge	Associated behavioural strategy
<i>'I won't be prepared for the future if I throw this away'.</i>	<i>'Am I worrying about something that might not actually happen?'</i>	Making the decision to discard
<i>'I'll lose something that I really cherish, if I throw this away'.</i>	<i>'If I think like this about all my possessions, then nothing gets thrown away'.</i>	Tolerating loss
<i>'I can't find the perfect place to keep this'.</i>	<i>'I can decide where to put this and it be a "good enough" place'.</i>	Deciding where to put something

than do potentially wrong short-term decisions (Neziroglu et al., 2004). Table 4 contains examples of cognitive and behavioural strategies for treating hoarding indecision. Hoarders therefore need exposure to the anxiety of making decisions about their possessions as a means of reducing possession-indecision. Frost et al. (2003) note that hoarders do not easily or quickly habituate during exposure exercises and therefore therapists need to recognize the need for prolonged exposure. Therapists need also to be aware of any 'put it here for now' decisions (Neziroglu et al., 2004) that encourage the indecisive churning of possessions.

The use of charts and diaries within and between therapy sessions is an important means of assessing whether discard is actually taking place and whether discard takes place in the absence of the therapist. Procrastination may be the thief of space as well as time in compulsive hoarding. Hoarders may additionally procrastinate due to the sheer scale of the clutter throughout the house. The treatment implications of this are that the hoarder needs to concentrate his or her discard efforts on particular spaces in the house, in order to gain visual feedback when some semblance of order returns and that his or her assumptions concerning discard are not actualized. Neziroglu et al. (2004) recommend only moving on from a target area in the

home when the goals for clearing that area are completed. Important in this effort is treatment contracting whereby the importance of daily behavioural exposure to discard of objects is championed. Time each day needs to be timetabled in the treatment contract for exposure to address the cognitive and behavioural maintainers of the compulsive hoarding. Before and after photographs of targeted areas provide indiscountable evidence of the ability to change (Frost & Steketee, 1998). In extreme cases, small highly visible target areas need to be selected to ensure early positive reinforcement of discard (Neziroglu et al., 2004) as this reduces hoarders' resistance to the 'monumental task' of clearing the whole house (Frost et al., 2003). Saxena and Maidment (2004) encourage 'scheduling' of daily discard efforts to ensure both exposure regularity and subsequent progress in terms of the physical environment.

As hoarders tend have low confidence in the efficiency of their memory functioning (Hartl et al., 2004), objects that represent memories need to be retained for fear of losing the memory attached to the object. Possessions tend to be kept on display rather than in closets and on shelves (Neziroglu et al., 2004), which appears to be underpinned by the assumption that if a possession is out of sight, then it is also potentially out of mind and therefore may

Table 5. Distinguishing various hoarding cognitive distortions arranged around the 'just in case' cognitive bias and associated potential challenges

Form of cognitive distortion	Example of 'just in case' cognitions	Example cognitive challenges
Overgeneralization	<i>'I once threw out something that I lived to regret. I can't risk ever feeling like that again'.</i>	<i>'I don't know how I will feel until I try and I have new skills to cope with such feelings'.</i>
All or nothing thinking	<i>'I either keep everything and feel safe or discard and feel panicky and overwhelmed'.</i>	<i>'I can work up my hierarchy of fear of discard slowly to gain confidence'.</i>
Should statements	<i>'You should always have everything close to hand, you never know when you may need it'.</i>	<i>'I can learn to tidy my possessions out of my sight'.</i>
Perfectionism	<i>'I need to keep this just in case I never see such a good example as this ever again'.</i>	<i>'I can limit my collecting to a theme, rather than collecting everything'.</i>
Jumping to conclusions	<i>'If I throw that away, I just know I will feel totally over-whelmed'.</i>	<i>'The more I throw away the more I learn to cope with the feeling. It's often not as bad as I expect'.</i>

be lost, harmed or discarded by mistake. Once objects are assumed to contain feelings and memories, such objects appear to take on almost human characteristics and representations for the hoarder (Frankenberg, 1984). To simply decide to discard of an object with such human characteristics therefore risks the threat of some possible form of harm, damage or abuse being visited upon that object (Frost et al., 1995), an object that the hoarder has assumed total prior responsibility for (Frost et al., 2003; Salkovskis, 1985). As such, the hoarder would assume that discard would mean that they were 'abandoning' the object to an unknown and unspecified fate, with attendant behaviourally dampening anticipated guilt and personal recrimination. Frost et al. (2003) note that use of 'downward arrow' techniques taken from cognitive therapy enables such key hoarding beliefs and assumptions to be identified.

Frost and Gross (1993) noted that hoarder acquired extra objects so as not to be caught without them, with the possession of objects circumventing the anxiety of non-possession. This suggests in hoarding that the 'better safe than sorry' rule cognitively underpinning mood and anxiety disorders (Gilbert, 1998) can be translated into a specific 'just in case' hoarding cognitive distortion. The treatment implications of such complex relationships between hoarders and their possessions is that therapy needs to map and understand hoarders' self-dialogues in order to capture and challenge the 'just in case' automatic

thoughts, beliefs and assumptions. Treatment therefore entails detailing 'just in case what?' to assess for the manner and degree to which the hoarder is inflating potential threats to security. Table 5 contains examples of various specific 'just in case' hoarding cognitions and potential challenges to such dysfunctional thoughts.

As each object tends to be viewed as unique by the hoarder (under-inclusiveness; Frost & Hartl, 1996; Saxena & Maidment, 2004), with little similarity and/or overlap between objects, such perceived threats of harm are presumably heightened and may be specific, complex and elaborate. The more objects are seen and observed by hoarders (Frost & Steketee, 1998), the greater the emphasis on their individuality, distinctiveness and associated emotional importance (Frost & Hartl, 1996), inevitably creating avoidance at the point of discard. Indeed, when deciding to discard of an item, it is common for hoarders to closely examine the object for fear of making a discard error. This tends to slow the pace of discard down to the extent that input into the home is always in excess of the output from the home. An important treatment implication is diary keeping of daily input/output ratios in order for the hoarder to reflect on successes and be cognizant of when the ratio is likely to maintain the status quo. Steketee and Frost (2003) noted that obsessive thoughts tend not to drive the compulsive aspects of hoarding, but rather, behavioural avoidance is prompted by visual or imaginary contact with hoarded items.

Both Smith (1990) and Jones, McGhee, and Wilkie (1990) noted the importance of visuospatial connectivity to possessions, creating affective connectivity to the potential threat of loss of ownership. In terms of treatment, Frost et al. (2003) state that such affective connectivity can be loosened by engaging hoarders in looking at the 'bigger picture' of how such bonds can be formed across multiple objects and how this creates the extensive clutter. When discard of possessions is achieved, some sort of reward system to positively reinforce the change in behaviour needs to be in place (Neziroglu et al., 2004).

The function therefore of objects for hoarders is their ability to function as environmental 'safety signals' (Rachman, 1983) across instrumental, intrinsic and sentimental forms of hoarding. As objects appear as the sole source of comfort, safety and security for the hoarder, a 'fragile sense of self' (Kellett & Knight, 2003) in hoarders remains constantly cosseted through cognitive and behavioural avoidance. For an outsider to touch, move or use a possession in some manner without prior permission, signals a loss of environmental/personal control and a lessening of the perception of a secure site. This would be especially the case should a family member/carer/friend/therapist discard of an object without prior discussion, with Neziroglu et al. (2004) describing an associated sense of 'violation'. The object's ability to function effectively as a safety source is thereby significantly compromised by the attendant increases in anxiety (Frost et al., 1995). A contract needs to be developed between therapist and hoarder, that the therapist will always seek permission to handle an object, as unauthorized handling of objects creates distress in hoarders (Frost et al., 1995) and would presumably severely disrupt the therapeutic alliance.

The security hypothesis may also have utility in terms of the co-morbid chronic levels and rates of acquisition often observed in hoarders (Frost & Gross, 1993; Frost et al., 1998). In terms of the security hypothesis, the 'just in case' cognitions in terms of the chronic acquisition of objects would be the anticipated threat of not immediately acquiring control of an object. Examples of chronic acquisition 'just in case' cognitions therefore might be: 'I'd better buy that, as I might not get another chance in the future' and 'I may not see another example like that again, its best to get one now' or 'It's on sale, it's a must'. The common psychological mechanism that appears to bind both the chronic acquisition and the associated failure to discard of objects

appears to be that of perseveration (Davey, 2003). In terms of therapy, Frost et al. (2003) emphasize that an effective treatment of hoarding needs to have a treatment of acquisition element to it, so that that input into the house is reduced as output is increased. Frost and Gross (1993) and Frost and Steketee (1998) note that acquisition cognitions can be challenged, and again, the keeping of input/output diaries may prove useful in the recognition of such flow problems. Behavioural exposure to the 'non-acquisition' of objects (Frost et al., 2003) is therefore a crucial element of treatment for hoarding.

Hypotheses and Clinical Implications Derived from the Model

This final section is concerned with outlining hypotheses and clinical implications drawn from the hoarding site-security model. The first hypothesis concerns the proposed schism between the ego-syntonic micro-behavioural aspects of hoarding and the ego-dystonic macro-distress variables. The hoarding literature would benefit from delineating hoarding procedures (such as churning) with the resultant impact variables (such as clutter and inappropriate use of space). Clinically, it would also be beneficial to delineate such factors with hoarders, as the purpose of treatment is to change macro-variables (e.g., distress, clutter etc.) by changing micro-variables (e.g., avoidance of discard). Frost and Steketee (1998) state that that the '*first and primary goal . . . is the creation of uncluttered living space*'; a macro-variable. Treatment contracting with hoarders therefore appears vital in establishing unambiguous goals for treatment. The investigation of wider emotional macro-impact variables such as shame, embarrassment and entrapment appears indicated. In terms of the exclusive resource hypothesis, it may be possible to analyse and categorize hoarded items via the exclusive resource potential ideas offered. Clinically, this may prove useful in terms of identifying exclusive resource 'fear-themes' in hoarders' patterns of avoidance and the 'just in case' cognitive distortions that are hypothesized to underpin such fears. The secure-site model states that schizotypal tendencies appear closely related to hoarding, which requires further investigation. Investigation of the direction of the relationship between hoarding and schizotypal behaviour appears crucial. A key research hypothesis is that high levels of 'macro' distress are related to low levels of schizotypy, while low levels of 'macro' distress are associated with high levels of

schizotypy. The secure-site model places emphasis on over-attachment to objects being created by childhood trauma acting upon evolved proclivities to hoard under certain environmental conditions. The investigation of the attachment histories of hoarders is sorely needed and indicated in the model. Clinically, working with poor attachment needs to be investigated as a potential treatment option in compulsive hoarding.

CONCLUSIONS

No previous concerted theoretical efforts have been made to attempt to identify possible commonly evolved hoarding mechanisms across species. The analysis of the biological and psychological literatures has enabled a synthesis position to be expounded in the form of the site-security model, which in turn has enabled associated treatment strategies to be expounded. This security hypothesis appears to offer the opportunity to both reanalyse more traditional psychological formulations regarding hoarding and provide testable hypotheses for future hoarding research. Despite hoarding typically being dismissed as inconsequential by society (Kyrios et al., 2002), it appears that the disorder that can create a 'perseverative treadmill' for the sufferer via the acquisition, collection and protection of objects, with often intolerable associated strain on sufferers, family, friends, neighbours and, at times, local communities (Steketee et al., 2000; Wilbram et al., 2007). The common treatment resistance and poor motivation (Steketee & Frost, 2003) observed in attempts to intervene in hoarding, whether it be via pharmacology, the range of psychotherapies or mixed interventions, appear far more understandable once a secure-site perspective is undertaken. The site-security model appears to contribute to the unresolved challenge of truly understanding compulsive hoarding and provides a range of indicated psychological treatment strategies.

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