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**An intensive time-series evaluation of the effectiveness of  
a cognitive-behavioural treatment for compulsive  
hoarding: A two-year prospective study**

**Thesis submitted for the degree of Doctor of Clinical Psychology  
University of Sheffield**

**Lisa Pollock  
BSc (Hons)  
August 2010**

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## **Declarations**

This work has not been submitted for any other degree or to any other institution.

## **Acknowledgements**

I would like to thank the patient who participated in this research, without which this study would not have been possible. I would also like to give my sincere thanks to Professor Peter Totterdell (academic supervisor) and Dr Stephen Kellett (NHS supervisor). The advice and wisdom you have both imparted throughout this project has been immeasurably useful. Finally, I would like to thank Glenn and my family, for their endless support and enthusiasm.

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## **SUMMARY**

This thesis explores the connected areas of compulsive buying and compulsive hoarding. The study is divided into two main sections. The first section is a critical review of the empirical evidence of treatments for compulsive buying undertaken through a detailed search and examination of published literature. The second section presents a research report of a single case experimental evaluation of cognitive-behavioural treatment of compulsive hoarding.

### **Section 1 – Literature Review Abstract:**

The current paper describes and critically reviews pharmacological and psychotherapeutic treatment studies of compulsive buying (CB). Current conceptual and theoretical issues surrounding the classification and conceptualisation of CB are discussed. The prevalence, epidemiology and co-morbidity of CB with other psychiatric disorders (particularly compulsive hoarding) are described. Each published treatment study of compulsive buying is critically reviewed in terms of its methodological design and findings. The limitations of the current evidence base for the treatment of compulsive buying are drawn in terms of conceptualisation/classification, measurement, and sampling methods. Recommendations for future CB outcome research are provided.

### **Section 2 – Research Report Abstract:**

The current study describes an Object-Affect Fusion (OAF) informed Cognitive-Behavioural Therapy (CBT) intervention with a 63-year old woman with compulsive hoarding. A single-case experimental design time-series analysis

was employed on 2-years of patient daily diary data relating to cognitive, behavioural and emotional factors in the lived experience of a compulsive hoarder. The patient showed statistically significant increases in incidence, frequency and volume of discard as a result of the intervention. Clinically reliable changes on a range of clinical outcome measures, including depression, general mental health, and compulsive acquisition and saving were noted. Visual clutter ratings showed reliable change in the upstairs area of the home only. Additional domiciliary visits as part of treatment protocol did not lead to increases in discard. Patient self-reported hoarding related cognitions, behaviour and affect showed statistically reliable reductions with exception of depression and shame. Results of the study provide preliminary evidence that OAF informed CBT interventions have clinical utility in the treatment of compulsive hoarding. Methodological limitations of the study, suggestions for future research and implications for clinical practice are discussed.

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## **SECTION 1: LITERATURE REVIEW**

**Compulsive buying: a critical review of the theoretical and  
empirical evidence regarding treatment effectiveness**

## **Compulsive buying: a critical review of the theoretical and empirical evidence regarding treatment effectiveness**

### **1. Aim**

To many, shopping is seen as a pleasurable leisure activity and part of everyday life (Lunt & Livingstone, 1992). In compulsive buying (CB), the urge to buy (regardless of personal need or cost) is so powerful, that it becomes uncontrollable, intrusive and senseless (e.g. McElroy, Keck, Pope, Smith & Strakowski, 1994). Compulsive buyers can be secretive and deeply ashamed of their problem and few seek help for fear of negative evaluation or stigmatisation (Benson, 2000). Compulsive buying has long been trivialised as the “smiled upon addiction” (Catalano & Soneberg, 1993). It is only in recent years that CB has begun to receive serious interest from researchers and clinicians alike. The conceptual and theoretical understanding of CB is still in its empirical infancy and is matched by the limited CB outcome evidence base.

The aim of this literature review is to firstly summarise current understanding of CB. Specific factors thought to be important in the development of CB, as well as its epidemiology, prevalence and co-morbidity with other disorders is presented. Current challenges surrounding the conceptual and definitional aspects of CB will be considered. The literature review will then describe and evaluate the current evidence base relating to the treatment of CB, and critique available research findings in terms of methodological rigour. The review will conclude by providing direction for future research.

## **2. Search strategy and inclusion/exclusion criteria**

Two major electronic databases – PsycINFO via OVIDSP 1806- present) and Web of Science (via Web of Knowledge 1900-present) were searched in January 2010. Searches were limited to literature in English. Search terms inputted into the database included ‘compulsive AND buying’ OR ‘compulsive AND shopping’, OR ‘compulsive AND spending’ which were first searched separately in abstract, keyword or title. Further search terms inputted included ‘treatments’ (exploded) OR ‘interventions’ (exploded) OR ‘outcome’ (exploded) in abstract, keyword or title. The results of the two separate searches were then combined using the Boolean operator AND in the search fields. Combined results of PsycINFO and Web of Science retrieved a total of 222 papers referred to either compulsive buying, compulsive shopping or compulsive spending. Both search engines retrieved a combined total of over 500,000 papers related to interventions, treatments or outcome. A total of 67 papers were retrieved as a result of combining studies referring to compulsive buying, shopping or spending with studies referring to treatment, intervention or outcome. The abstracts of these papers were then hand searched. Papers which did not describe specific treatments or interventions for compulsive buying were excluded (n=50). A total of 17 papers were selected for final inclusion in the review.



### **3. Introduction to compulsive buying**

The phenomenon of CB has been recognised since the early 1900's, via qualitative case reports (e.g. Bleuler, 1923; Kraepelin, 1909) and more recently within psychodynamic case literature (e.g. Krueger, 1988; Laurence, 1990; Winestine, 1985). Compulsive buying (CB) disorder is a chronic and disabling condition (Kyrios, Frost & Skeketee, 2004), characterised by a maladaptive preoccupation with buying or shopping. The urge to shop is typically experienced as intrusive and irresistible, creating intolerable affect which tends to be relieved when a purchase is made (Black, 2007). Individuals with CB show a preoccupation with shopping, spending and keeping up with latest fashion trends and can spend hours per week engaging in shopping behaviour (Black, 2007). CB significantly interferes with social and/or occupational functioning (Black, 2007), causes significant financial problems (with cases of individuals with debts over \$30,000 on credit cards – see Black, Gabel, Hansen & Schlosser, 2000 for example).

### **4. Classification of compulsive buying**

The definitive classification of compulsive buying is contentious (Black, 2007 p.14). Compulsive buying is not recognised as a disorder in its own right within the DSM-IV-TR (APA, 2000), and falls within a broader category of 'impulse control disorder - not otherwise specified' (APA, 2000).

An ongoing theoretical issue is whether CB is best represented under the 'impulse control disorders' umbrella, or whether it is more representative of obsessive-compulsive processes (Kellet, 2009 p. 86). Impulse control

disorders (ICD's) (currently including intermittent explosive disorder, kleptomania, compulsive gambling, pyromania and trichotillomania) describe irresistible, impulsive and uncontrollable urges, characterised by increasing feelings of anxiety and tension, which are relieved through action, providing a sense of pleasure or gratification (APA, 2000). Compulsive disorders (e.g. obsessive compulsive disorder, OCD), refer to the performance of repetitive behaviours with the aim of reducing anxiety or distress, but which are not for the primary purpose of pleasure or gratification (APA, 2000). The exact nature of the relationship between ICD's and OCD is currently unknown; it being likely that there is a complex interplay between the two (Grant & Potenza, 2006). Current diagnostic criteria for CB (e.g. McElroy, Keck, Pope, Smith & Strakowski, 1994) suggest that CB may contain both impulsive and compulsive qualities.

## **5. Antecedents of compulsive buying**

Current research relating to potential antecedents of CB falls into three main areas, namely; *familial*, *psychological* and *social*. Evidence from family studies suggests persons with CB are more likely to have received parental care and attention via material gifts such as money or 'treats' (Scherhorn, 1990) and have childhood environments lacking in emotional warmth and nurturance (Krueger, 1988), and are more likely to report low self esteem during childhood (Faber, 1992). Compared to matched controls, individuals with CB have first-degree relatives with higher incidences of psychiatric morbidity and dysfunction including depression, substance misuse and alcoholism (Black, Repertinger, Gaffney & Gabel, 1998). Whilst CB effectively temporarily relieves negative

emotional and psychological states, any associated benefit is subsequently overshadowed by feelings of guilt and depression when the reality of shopping binges is realised (Christenson, Faber, de Zwann, Raymond, Specker, Eckern, Mackenzie, Crosby, Crow, Eckert, Mussell & Mitchell, 1994). CB then becomes a cyclical process, to both bolster self esteem and relieve the guilt and low mood, resulting from shopping episodes (Kellett, 2009). Other researchers define CB as a socially created problem (e.g. Lee & Mysyk, 2004), arising from a culture of easily accessible consumer credit (Dittmar & Drury, 2000). Black, (2007) argues such socially determined approaches undermine the psychological and emotional distress experienced by individuals with CB and attempts to treat this disorder.

## **6. Prevalence of compulsive buying**

There is a limited amount of research attesting to the prevalence rates of CB. Early studies conducted in the USA, estimated prevalence between 1.8% (Faber & O'Guinn, 1992) and 16% (Magee, 1994). A more recent study of a large general population sample (n= 2,513) later placed this estimate at around 5.8% (Koran, Faber, Aboujaoude, Large & Serpe, 2006). A German based survey of CB conducted in the early 1990's, estimated prevalence of CB in West Germany to be 5.1%, whilst only 1% in East Germany (Scherhorn, Reisch & Raab, 1990). In the following 10 years, as modernisation, consumer culture and social participation increased, particularly within old East Germany, so did the prevalence of CB; up to 8% for West Germans and 6.5% for East Germans (Neuner, Raab & Reisch, 2005). This suggests economic prosperity and

resultant cultural changes appear to impact upon increased rates of compulsive buying, highlighting the need for a biopsychosocial perspective.

## **7. Epidemiology of compulsive buying**

The typical age of onset of CB is estimated to be between 18 to 30 years (Black, 1996). Early estimates suggested approximately 80-95% of individuals with CB were women (Black, 1996). Some argue gender differences in CB may not necessarily reflect a greater frequency of CB amongst women, but rather the different conceptualisations of 'buying' behaviour between men and women. Women more likely to state that they enjoy 'shopping' whereas men are more likely to use the term 'collecting' to describe their patterns of consumption (Black, 2007 p.14). A more recent large sample CB study suggested that rates of CB are in fact comparable between both men (1.3%) and women (1.5%) respectively (Koran, Faber, Aboujaoude, Large & Serpe, 2006).

## **8. Psychiatric co-morbidity in compulsive buying**

Table 1 summarises treatment and non-treatment studies with reported levels of psychiatric co-morbidity in CB samples. As the data illustrate, CB tends to have a high rate of co-morbidity with other psychiatric problems, frequently including anxiety and depression (e.g. Black, 1998; Black, Monahan & Gabel, 1997; Black, Gabel, Hansen & Schlosser, 2000; Christenson, Faber, de Zwann, & Raymond, 1994; McElroy, Satlin, Pope, Keck & Hudson, 1991; McElroy *et al.*, 1994; Mertens, Silberman, Mitchell & de Zwann, 2007; Mueller, Mueller, Albert, Mueller, Mueller, Silberman, Reinecker, Bleich, Mitchell and de Zwann, 2008; Ninan, McElroy, Kane, Knight, Bettina, Casuto, Rose, Marsteller &

Nemeroff, 2000), obsessive compulsive disorder (e.g. Christenson, Faber, de Zwann, & Raymond, 1994), and pathological gambling (e.g. Black, Gabel, Hansen & Schlosser, 2000; Schlosser, Black, Repertinger & Freet, 1994).

Table 1. Rates of CB co-morbidity across treatment and non-treatment studies

<i>Diagnosis</i>	Treatment studies									
	<i>McElroy et al., (1991)</i>	<i>McElroy et al., (1994)</i>	<i>Black et al., (1997)</i>	<i>Black et al., (1998)</i>	<i>Ninan et al., (2000)</i>	<i>Koran et al., (2002)</i>	<i>Koran et al., (2003)</i>	<i>Mitchell et al., (2006)</i>	<i>Koran et al., (2007)</i>	<i>Mueller et al., (2008)</i>
	N=3 <i>Outpatient sample</i>	N=20 <i>Outpatient sample</i>	N= 10 <i>Community sample</i>	N=33 <i>Community sample</i>	N=42 <i>Outpatient and community sample</i>	N=24 <i>Community sample</i>	N=24 <i>Community sample</i>	N= 39 <i>Community sample</i>	N=26 <i>Community sample</i>	N=31 <sup>1</sup> , 29 <sup>2</sup> <i>Community sample</i>
	%	%	%	%	%	%	%	%	%	%
<b>Affective disorders</b>										
Major depressive disorder	33	25	50	61	45	8	20	62	27	58, 59
Dysthymia	33	-	-	-	-	12	12	5	15	-
Bipolar disorder	33	35	-	-	-	-	-	-	-	-
Somatisation disorder	33	-	-	-	-	-	-	-	-	-
Body dysmorphic disorder	-	-	-	-	-	-	-	3	-	-
Any lifetime affective disorder	-	95	-	64	-	-	-	-	-	-
<b>Anxiety disorders</b>										
Obsessive-compulsive disorder	33	35	-	3	12	-	-	13	-	26, 32
Panic disorder	33	50	10	-	-	-	-	26	-	-
PTSD	-	-	-	-	-	4	4	13	-	-
Simple phobia	-	20	40	-	-	-	-	-	-	-
Specific phobia	-	-	-	-	-	-	-	21	-	-
Agoraphobia	-	-	-	-	-	8	-	-	-	-
Generalised anxiety disorder	-	30	10	-	-	21	-	-	-	-
Social phobia	-	30	-	9	10	-	5	8	15	-
Any lifetime anxiety disorder	-	-	-	42	-	-	-	5	-	81, 70
<b>Eating disorders</b>										
Anorexia nervosa	-	20	10	-	-	-	-	-	-	-
Bulimia nervosa	33	25	10	-	10	8	-	3	-	-
Any lifetime eating disorder	-	-	-	15	-	-	-	15	-	-
<b>Substance use disorders</b>										
Alcohol abuse/dependence	-	35	40	18	14	-	-	33	-	-
Other substance abuse/dependence	-	20	-	-	-	-	-	-	-	-

<sup>1</sup> CBT treatment group

<sup>2</sup> Waiting list control (WLC) group

Any abuse/dependence	-	40	-	21	-	-	-	-	-
<b>Impulse control disorders</b>									
Intermittent explosive disorder	-	10	-	-	-	-	-	-	-
Kleptomania	-	10	-	-	-	-	-	-	-
Compulsive hoarding	-	-	-	-	-	-	-	-	-
Pathological gambling	-	5	10	-	-	-	5	-	-
Pyromania	-	10	-	-	-	-	-	-	-
Trichotillomania	-	10	-	-	-	-	5	-	-
Paraphilia/sexual addictions	-	10	-	-	-	-	-	-	-
<b>Attention deficit disorders</b>									
Attention deficit disorder	-	-	10	-	-	-	-	-	-

Table 1 continued

Non-treatment studies						
<i>Diagnosis</i>	Christenson <i>et al.</i> ,(1994)	Frost <i>et al.</i> , (2009)	Mitchell <i>et al.</i> , (2002)	Mueller <i>et al.</i> , (2007)	Mueller <i>et al.</i> , (2009)	Schlosser <i>et al.</i> , (1994)
	N=24 <i>Community sample</i>	N=653 <i>Community sample</i>	N= 19 <i>Community sample</i>	N=38 <sup>3</sup> ,39 <sup>4</sup> <i>Community sample</i>	N= 105 <i>Community sample</i>	N=46 <i>Community sample</i>
	%	%	%	%	%	%
<b>Affective disorders</b>						
Major depressive disorder	50	-	53	45, 62	-	28
Dysthymia	17	-	-	-	-	-
Bipolar disorder	-	-	-	-	-	-
Somatisation disorder	-	-	-	-	-	-
Body dysmorphic disorder	-	-	-	-	-	-

<sup>3</sup> German outpatient sample

<sup>4</sup> USA outpatient sample

Any lifetime affective disorder	-	-	58	76,62	-	-
<b>Anxiety disorders</b>						
Obsessive-compulsive disorder	13	-	16	-	-	4
Panic disorder	13	-	-	-	-	17
PTSD	-	-	-	-	-	-
Simple phobia	17	-	-	-	-	28
Specific phobia	-	-	-	-	-	-
Agoraphobia	-	-	-	-	-	-
Generalised anxiety disorder	21	-	-	-	-	30
Social phobia	21	-	16	-	-	-
Any lifetime anxiety disorder	-	-	53	-	-	-
<b>Eating disorders</b>						
Anorexia nervosa	-	-	-	-	-	-
Bulimia nervosa	13	-	-	18,15	-	17
Any lifetime eating disorder	-	-	5	26,15	-	-
<b>Substance use disorders</b>						
Alcohol abuse/dependence	46	-	47	18, 33	-	28
Other substance abuse/dependence	-	-	-	-	-	13
Any abuse/dependence	46	-	53	24,49	-	30
<b>Impulse control disorders</b>						
Intermittent explosive disorder	4	-	-	-	-	22
Kleptomania	4	-	-	-	-	37
Compulsive hoarding	-	61	-	61	39	-
Pathological gambling	8	-	-	-	-	20
Pyromania	-	-	-	-	-	2
Trichotillomania	3	-	-	-	-	11
Paraphilia/sexual addictions	-	-	-	-	-	13
<b>Attention deficit disorders</b>						
Attention deficit disorder	-	-	-	-	-	-



## **9. Compulsive buying and compulsive hoarding**

A number of studies have found an association between participant scores on clinical measures of CB and compulsive hoarding (e.g. Frost & Gross, 1993; Frost, Kim, Morris Bloss, Murray Close & Skeketee, 1998; Frost, Steketee & Williams, 2002). Table 1 displays reported data for individuals with CB and co-morbid lifetime psychiatric illnesses, including compulsive hoarding. Mueller, Mitchell, Crosby, Glaesmer & de Zwann, (2009) report a German population-based sample (n=2,307), in which around 40% of those with compulsive buying also reported co-morbid compulsive hoarding behaviours. Recent research suggests that the presence of CB symptomology is associated with greater severity of hoarding behaviour and social impairment (Frost, Tolin, Steketee, Fitch & Selbo-Burns, 2009; Mueller et al., 2007).

It has been suggested that compulsive buying could be nested within the broader construct of 'compulsive acquisition' (Mueller, Mueller, Albert, Mertens, Silbermann, Mitchell, & de Zwann, 2007). Compulsive 'acquisition' (as seen in hoarding behaviour) involves buying items, picking up free things (including objects discarded by others) as well as saving objects or possessions typically perceived as useless or of limited value. Our understanding of the relationship between compulsive buying and compulsive hoarding is in its infancy, and represents an important area of future research (Mueller *et al.*, 2007). Efficacious treatments for compulsive buying may also be beneficial in the treatment of compulsive hoarding symptoms, and this will have important implications for our understanding of both disorders.

## **10. Summary**

Current empirical evidence surrounding the aetiology of compulsive buying behaviour has been described. Whether CB is best understood as an impulse control disorder (ICD), on the obsessive compulsive disorder (OCD) spectrum or both; remains open to debate. Recent research suggests that CB is a disorder with biological, psychological, and social underpinnings, and theoretical integration and synthesis of common factors involved in CB is needed for research to progress. CB is a disorder which frequently shares significant co-morbidity with other psychiatric disorders, particularly compulsive hoarding.

Over recent years, there has been a growth in the development and treatments for CB. Studies have primarily implemented various pharmacological treatments (including fluvoxamine, naltrexone, and citalopram), with mixed outcomes. The last 10-years have seen increased focus on psychological modalities, specifically cognitive-behavioural and family therapies. This review will now examine and critically evaluate the CB outcome literature. Table 2 summarises the published CB outcome studies, described in the current review. Effect size calculations were calculated (Table 3) for those CB treatment studies reporting pre-post outcomes. An effect size of 0.8 or above is considered large; 0.5 medium and 0.2 small. For some outcome studies, missing results did not allow effect size calculations to be calculated and therefore only partial data is included.

Table 2. Summary of pharmacological, combined and psychotherapeutic treatment studies

**Pharmacological studies**

Author	Sample size and recruitment method	Inclusion/exclusion criteria and co-morbidity	Diagnosis of CB	Methodology and treatment	Measures	Outcomes
<b>McElroy <i>et al.</i>, (1991)</b>	N= 3 females (aged 33-45 years) with self reported problematic CB ranging from 8 months – 5 years  Outpatient sample	Patients met DSM-II-R criteria for ICD-not otherwise specified  No exclusion criteria  Co-morbidity present in sample	DSM-II-R criteria for 'impulse control disorder – not otherwise specified' (APA, 1987)  Patient self-report of CB symptoms	Case reports  Case1: Treatment with fluoxetine Case 2: Treated with bupropion; nortriptyline and fluoxetine Case 3: Treated with fluoxetine	Patient self-report of reduction in CB only	Case1: Treatment with fluoxetine (40mg/d) resulted in remission of CB in 4-6 weeks; fluoxetine 40mg/d with clonazepam resulted in further CB symptom remission during 14-month follow-up  Case 2: Bupropion (up to 100 mg/d) led to reduction in depression and CB, maintained for 3-wks. Nortriptyline (100mg/d) substituted for bupropion due to side effects – rapid relief in CB. Nortriptyline substituted for fluoxetine (20mg/d) due to side effects – combined with citalopram (1.5mg/d) resultant remission of CB maintained at 4 month follow-up  Case 3: Treated with fluoxetine (70mg/d) resultant reduction in CB symptoms after 1-week, after 3 further

						weeks of treatment CB significantly improved but not in remission
<b>Black <i>et al.</i>, (1997)</b>	10-non depressed compulsive buyers (9 female; 1 male mean age 41.4 years) Word of mouth recruitment	Individuals with current clinical depression excluded  Other psychiatric co-morbidity present in sample	McElroy <i>et al.</i> , (1994); Faber & O'Guinn (1992) diagnostic criteria  CB behaviour present for 1-year or longer	9-week open-label trial of fluvoxamine	Baseline and treatment termination (9 weeks measures):  Compulsive Buying Scale (CBS) (Faber & O'Guinn, 1992)  Yale Brown Obsessive Compulsive Scale-Shopping Version YBOCS-SV (Monahan, Black & Gabel, 1996)  National Institute of Mental Health Obsessive Compulsive Scale NIMHOCS (Insel, Murphy, Cohen <i>et al.</i> , (1983)  3 Clinical Global Impression (CGI) ratings (Guy, 1976)  Patient Self Rating Scale (Sheenan, 1986)	Between baseline and treatment termination (week 9); 9 out of 10 participants showed statistically significant improvements on all measures 3 out of 10 participants lost to 13-week follow-up. 7 participants remaining at follow-up
<b>Black <i>et al.</i>, (2000)</b>	23 participants (22 females, 1 male; mean age 42 years) Word of mouth recruitment	Individuals with co-morbid mood, anxiety or significant mental health disorders and individuals undergoing active psychotherapy excluded	McElroy <i>et al.</i> , (1994); Faber & O'Guinn, (1992)  CB symptoms of 1-year or longer duration	Fluvoxamine versus placebo in 9-week open label trial	Baseline and end of treatment measures (week 9):  YBOCS-SV (Monahan, Black & Gabel, 1996)  NIMHOCS (Insel, Murphy, Cohen <i>et al.</i> , (1983)  Hamilton Rating Scale for Depression (HRD) (Hamilton, 1967)	Failure to demonstrate a fluvoxamine treatment effect  No significant differences between fluvoxamine and placebo treated participants on any outcome measures except MOI (greater improvements in fluvoxamine treated group)

Maudsley Obsessive Compulsive Inventory (Hodgson & Rachman, 1977)

Sheenan Disability Scale (Sheenan, 1986)

Self report of CB symptoms

<b>Ninan <i>et al.</i>, (2000)</b>	42 patients 34 (81%) female (aged between 18-65 years) 23 completed the study	Individuals with lifetime history of psychosis, hypomania, current suicide ideation, unstable medical conditions, pregnancy excluded	CB symptoms screened over telephone using Structured Clinical Interview for DSM-IV	13-week double-blind fluvoxamine or placebo treatment	Baseline and 13-week outcome measures:	Failure to demonstrate a fluvoxamine treatment effect when compared to placebo
	Clinical referral and media advertisements	Other co-morbid disorders present in sample			YBOCS-SV (Monahan, Black & Gabel, 1996)	No significant differences found between fluvoxamine and placebo groups on any measure of outcome. High placebo rate observed
					CGI (Guy, 1976)	
					Global Assessment of Functioning (APA, 1994)	
					HRD (Hamilton, 1967)	
					Daily self-report/diaries of shopping habits	
<b>Koran <i>et al.</i>, (2002)</b>	24 participants (22 females, 2 males)	Exclusion criteria: Co-morbid organic or psychotic mental disorders, learning disabilities, OCD, bipolar disorder, factitious disorders, dissociative disorders substance abuse or individuals wishing to or receiving psychotherapy	McElroy <i>et al.</i> , (1994)	7-week open label trial followed by 9-week double-blind placebo controlled discontinuation trial of citalopram	YBOCS-SV (Monahan, Black & Gabel, 1996)	50% showed improvement in CB symptoms with mean daily dosage of 21.4mg of citalopram by week two.
	Media advertisement	Other co-morbid psychiatric	Problematic shopping behaviour for 1-year or longer		CGI (Guy, 1976)	
			Report shopping episodes of at least once-per week over last 3-months		Patient global Improvement Rating (Hamilton, 1967)	38% of participants had end-of treatment YBOCS-SV scores of 0, 21% had scores of 4 or
					Montgomery-Asberg Depression Rating	

		disorders present in sample			Scale (MADRS) (Montgomery & Asberg, 1979)	less. 54% of participants rated CGI scores as 'very much' improved or 'much improved' (17%).  3 participants symptom free without citalopram for 5 months; 7 experienced relapse in CB symptoms. Four of 7 individuals restarting  citalopram regained control of CB symptoms.
<b>Koran et al., (2003)</b>	24 participants (23 females and 1 male)  Media advertisement	Exclusion criteria: Co-morbid organic or psychotic mental disorders, learning disabilities, OCD, bipolar disorder, factitious disorders, dissociative disorders substance abuse or individuals wishing to or receiving psychotherapy  Co-morbid psychiatric disorders present in sample	McElroy et al., (1994)  Problematic shopping behaviour for 1-year or longer  Score of 17+ on YBOCS-SV (Monahan et al., 1996)	7-week open label trial followed by 9-week double-blind discontinuation trial of citalopram over 1-year	YBOCS-SV (Monahan, Black & Gabel, 1996)  CGI (Guy, 1976)  Patient Global Improvement Rating (Hamilton, 1967) MADRS (Montgomery & Asberg, 1979)	5 out of 8 individuals (63%) in the placebo group relapsed compared to none of individuals who continued citalopram treatment as usual (n=7).  Citalopram treatment group rated as 'much improved' or 'very much improved' on the CGI, with 50% or greater decrease in YBOCS-SV scores.
<b>Koran et al., (2007)</b>	26 women (mean age 45.1)  Media advertisement	No individuals to be undergoing psychotherapy and discontinue all psychotropic medications for	Meet McElroy et al.,(1994) CB criteria for at least 1 year	Participants were started on an open-label 10mg/d dose of Escitalopram, which	YBOCS-SV (Monahan, Black & Gabel, 1996)  CGI (Guy, 1976)	No differences between the escitalopram and placebo groups. Six out of 9 individuals in the

		at least 1-week prior to trial	Engage in compulsive buying at least once per week for the last 6-months	was increased to 20 mg/d after four-weeks for non-responders. After the first phase of the trial (7-weeks), treatment responders (defined as individuals with a CGI score of either 'very much' or 'much improved' and a YBOCS-SV score of <17 and 50% decrease	MADRS (Montgomery & Asberg, 1979)	placebo group relapsed, compared to 5 of 8 continuing escitalopram.
		Co-morbid psychiatric disorders present in sample	Score of 17+ on YBOCS-SV (Monahan <i>et al.</i> , 1996)			
				from baseline) were then randomised to either 9-weeks of escitalopram or placebo		
<b>McElroy <i>et al.</i>, (1994)</b>	Report of 20 CB cases  N=16 females, 4 males (mean sample age 39 years)  Outpatient sample	Inclusion criteria: McElroy <i>et al.</i> , (1994) Criteria developed: Buying described as 1) Uncontrollable 2) Significantly distressing, time consuming or resulting in social or financial difficulties 3) Not occurring in the context of hypomanic or manic symptoms  Co-morbid psychiatric disorders present in sample	McElroy <i>et al.</i> , (1994) criteria developed during study	Treatment with various drug combinations (e.g. fluoxetine, nortriptyline, lithium, bupropion, setraline)	Self reported reductions in CB symptoms	9 of 13 patients described significant or complete reductions in buying behaviour in response to antidepressants administered alone or in conjunction with mood stabilizers
<b>Grant (2003)</b>	3 females Case 1 – 32-year old woman Case 2 – 43-year old male Case 3 – 28-year old woman  Clinical outpatient	Cases met CB criteria however not reported how assessed Co-morbidity absent in all 3 cases	Not reported	Treatment with naltrexone (100-200 mg/d) Treatment duration between 10-32 weeks	Unknown	Self reported CB symptoms showed partial or complete remission within 1-4 weeks in all cases  Relapse in CB symptoms when naltrexone was

	referral					withdrawn; control of CB symptoms regained in all 3 cases between 8-32 weeks following re-administration of naltrexone.
<b>Guzman et al., (2007)</b>	1 female patient aged 37-years  Clinical outpatient referral	Co-morbid psychiatric disorder in case	Not reported	Case report  Outpatient treatment  Participant treated with topiramate (50mg/d)	Beck Depression Inventory (BDI) (Beck, Steer & Brown, 1995)	After beginning topiramate, authors report CB 'subsided' and depression 'remitted'.
				combined with venlafaxine (225mg/d) over 1 month)		

## Combined treatment studies

Author	Sample size and recruitment method	Inclusion /exclusion criteria and co-morbidity	Diagnosis of CB	Methodology and treatment	Measures	Outcomes
<b>Bernik et al., (1996)</b>	2 separate N=1 case studies Patient 1 – 31-year old woman Patient 2 – 34-year old woman	Co-morbid psychiatric disorders present in both cases	Self-report only	Behavioural treatment Exposure and response prevention	Not reported	Authors report both cases demonstrated either a complete remission or complete control over their CB in 3-4 weeks.
<b>Markinko &amp; Karlovic (2005)</b>	Clinical patient recruitment Case study N=1 32-year old female  Clinical patient recruitment	Co-morbidity not reported	Self-report only	Treated with combination of fluvoxamine and individual cognitive behavioural therapy	Not reported	Authors report complete remission of CB symptoms following treatment which was maintained at 12-month follow-up



## Psychotherapeutic studies

Author	Sample size and method	Inclusion /exclusion criteria and co-morbidity	Diagnosis of CB	Methodology and treatment	Measures	Outcomes
<b>Kellett &amp; Robinson (2009)</b>	Case study N=1 40-year old female	Faber & O'Guinn, (1992) CB criteria	Faber & O'Guinn, (1992) criteria	Single-case experimental design (SCED) A,B,C plus follow-up.	CBS (Frost <i>et al.</i> , 1998)	At end of treatment client no longer met criteria for CB; progress which was maintained over follow-up
	Clinical patient recruitment	Co-morbidity reported absent in case		CBT (phase B) Person Centred Counselling treatment (phase C)	YBOCS-SV (Monahan <i>et al.</i> , 1996)  Brief Symptom Inventory (BSI)(Derogatis, 1993)  BDI (Beck, Steer & Brown, 1995)  Inventory of Interpersonal Problems-32 (IIP-32 (Barkham, Hardy & Startup, 1996)	
<b>Kellett &amp; Bolton (2009)</b>	N =1 case study 36-year old female	Faber & O'Guinn, (1992) criteria	Faber & O'Guinn, (1992) criteria	Cognitive behavioural therapy	CBS (Frost <i>et al.</i> , 1998)	At end of treatment client no longer met criteria for CB; progress which was maintained over follow-up
	Clinical patient recruitment	Co-morbidity not reported by authors		14, 50-minute outpatient sessions (three assessment sessions, 10 intervention sessions, one follow-up session 6-months post intervention)	YBOCS-SV (Monahan <i>et al.</i> , 1996)  BSI (Derogatis, 1993)  BDI (Beck, Steer & Brown, 1995)  IIP-32 (Barkham, Hardy & Startup, 1996)	

<b>Mitchell et al., (2006)</b>	28 females Recruited via media advertisement	Individuals with current or previous psychiatric histories were excluded; as were participants receiving psychotherapy treatment  Co-morbid psychiatric disorders present in sample	Faber & O'Guinn, (1992)	Allocation to 1 of 4 CBT group therapy treatment groups, n=11 allocated to waiting list control  Therapy conducted via 12, 1.5 hour group therapy sessions over 10-weeks	CBT groups assessed at baseline, end of treatment (10-weeks) and 6-month follow-up. Individuals on waiting list control reassessed at 3-months.  CBS (Faber & O'Guinn, 1992)  YBOCS-SV (Monahan et al., 1996)  BDI (Beck et al., 2006)  Four week purchasing recall (Burgard et al., 2006)  Outcomes Study Short form 36 (Ware et al., 1993)	Baseline comparisons showed significant improvement in all measures. Large effects sizes notes on the CBS, YBOCS-SV and 4-week purchasing recall, with improvements maintained at 6-month follow up  10 participants reported complete remission of CB episodes during previous 4-weeks compared to none of participants in waiting list control
<b>Mueller et al.,(2008)</b>	31 participants Mean age 41 years  Recruited via media advertisement	Exclusion criteria: Individuals with active suicidal ideation, mania  Individuals could be on anti-depressants in on stable dose for 3 months or longer;  Individuals could be receiving	McElroy et al., (1994)	Randomized controlled trial comparing Burgard et al's., (2006) group CBT treatment programme with waiting list control	CBS (Faber & O'Guinn, 1992)  YBOCS-SV (Monahan et al., 1996)  SCL-90 (Franke, 1995)	N=24 available for follow-up.  Significant differences between the CBT and waiting list control groups on CBS, YBOCS-SV and CBS with significant improvements in CBT group which were maintained at 6-month follow-up.

		psychotherapy if began treatment 6 months previously			Barratt Impulsiveness Scale (Patton, Stanford & Barratt, 1995)	CBT treatment did not have impact on SCL-90-R, BIS or SI-R scores.
		Co-morbid psychiatric disorders present in sample			Saving Inventory Revised (Frost, Steketee & Grisham, 2004)	Higher rates of pre-treatment hoarding significant predictors of non-remission of CB symptoms and poor treatment attendance.
<b>Park et al., (2006)</b>	N=1 Family therapy treatment of 24-year old female with CB  Recruitment method not reported	Inclusion/exclusion criteria not reported  Co-morbidity not reported	Not reported	Fifteen family therapy sessions (individual, parental, family and telephone based sessions)  Sessions taped/video recorded and analysed qualitatively using grounded theory (Glaser & Strauss, 1967; Strauss & Corbin, 1998)	Not reported	6 key factors related to CB (communication issues with family members; sibling relationships; mothers parenting and communication style, interpersonal relationships and stress.  Change in CB behaviour attributed to better communication with family; development of close sibling relationship; change in mother's parenting style and communication; positive interpersonal relationships and decreased family stressors.

Table 3. Published outcome data of treatment studies in compulsive buying

CB treatment studies	Patients (n=)	Outcome measure	Pre	Post	Effect size
Black <i>et al.</i> , (1997)	(n=10)	YBOCS-SV	21.1	12.0	2.02
Koran <i>et al.</i> , (2002)	(n=24)	YBOCS-SV	22.6	7.2	1.62
Koran <i>et al.</i> , (2003)	(n=24)	YBOCS-SV	24.4	8.2	1.98
Guzman <i>et al.</i> , (2007)	(n=1)	BDI-II	26/63	n/a	n/a
Kellett & Robinson (2009)	(n=1)	CBS	-2.87	3.27	n/a
Kellett & Bolton (2009)	(n=1)	YBOCS-SV	19.00	11.00	3.2
Mitchell <i>et al.</i> , (2006)	(n=28)	YBOCS-SV	22.6	6.4	2.19
Mueller <i>et al.</i> , (2008)	(n=24)	YBOCS-SV	20.7	13	0.88
Bernik <i>et al.</i> , (1996)	(n=2)	n/a	n/a	n/a	n/a
Grant (2003)	(n=3)	n/a	n/a	n/a	n/a
Markinko & Karlovik (2005)	(n=1)	n/a	n/a	n/a	n/a
McElroy <i>et al.</i> , (1991)	(n=3)	n/a	n/a	n/a	n/a
McElroy <i>et al.</i> , (1994)	(n=20)	n/a	n/a	n/a	n/a

## **11. PHARMACOTHERAPY TREATMENT**

By far the largest area of research focused on treatments for compulsive buying have been pharmacological, including treatment with a range anti-depressants (administered alone or in combination (e.g. Black, Monahan & Gabel, 1997; McElroy, Satlin, Pope, Keck & Hudson, 1991); opioid agonists (e.g. naltrexone – Grant, 2003) and anti-convulsants (e.g. Guzman, Filomensky & Taveres, 2007).

### **11.1. Anti-depressant treatment**

McElroy, Satlin, Pope, Keck and Hudson, (1991) reported outcomes of three female cases of CB treated with antidepressants (fluoxetine, bupropion or nortryptiline). All patients met DSM-II-R criteria for an 'impulse control disorder - not otherwise specified' (APA, 1987) had histories of problematic buying behaviour ranging from 8 months to 5 years and presented with co-morbid mood and anxiety disorders. The findings indicated that within 4 weeks of treatment, all three cases showed a partial or complete remission in urges to buy, which was comparable amongst the different antidepressants used.

### *11.2. Critique of study*

A number of limitations exist with this study. Firstly, no control or comparison groups were used, making it difficult to draw firm conclusions about treatment efficacy. It is possible, for example, that the improvements in CB symptoms were a function of a 'placebo' effect, or indeed increased therapist contact and support. The small sample size, consisting of all women limits the generalisability of the findings and would need to be replicated in a much larger sample. High levels of co-morbidity were present in the cases treated. It

therefore cannot be ruled out that treatment was in fact targeting anxiety or depression, rather than CB symptoms as assumed. CB was not measured or assessed formally, other than via narrative self-reports, and no statistical analysis of outcomes were performed, making it particularly difficult to evaluate the level of change in CB symptoms observed. Despite success in reduction of CB symptoms in all three cases (partial reduction in one case), the study employed a complicated regimen of drug treatments (using different anti-depressants in each case), and does not give a detailed account of drug administration procedures, making it extremely difficult to formally assess a true 'drug effect'.

### **11.3. Fluvoxamine<sup>5</sup> treatment**

Black, Monahan and Gabel (1997) treated 10 non-depressed compulsive buyers in a 9-week open-label trial<sup>6</sup> of fluvoxamine. Individuals were required to meet both the McElroy *et al.*, (1994) and Faber and O'Guinn, (1992) diagnostic criteria for CB, and display problematic buying behaviour for 1-year or longer. The sample comprised 9 women and 1 man with a mean sample age of 41.4 years. Between baseline and treatment termination (week 9), 9 out of 10 participants showed statistically significant improvements on all measures. A

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<sup>5</sup> Fluvoxamine is an anti-depressant selective-serotonin reuptake inhibitor (SSRI), recommended in the management of depression and anxiety disorders (see Figgitt and McClellan, 2000 for an overview).

<sup>6</sup> Open label trials are clinical trials in which both the patients and the researcher know which treatment is to be administered. Random allocation to treatment groups can be employed but not always, which unfortunately means that outcome may be attributable to other factors other than treatment administered (e.g. placebo effect, therapist contact) leaving the study susceptible to bias.

total of 3 out of the original 10 individuals were lost to follow-up at 13-weeks. However, all seven participants remaining at 13-week follow-up requested continuation of fluvoxamine treatment.

Black, Gabel, Hansen and Schlosser (2000) later compared fluvoxamine to placebo treatment, in a subsequent 9-week, open-label trial. The sample (22 females and 1 male; mean sample age 42 years) were randomly assigned to either Fluvoxamine (n=12) or placebo (n=11) treatment conditions. In contrast to the earlier Black *et al.*, (1997) study, the findings failed to demonstrate a fluvoxamine treatment effect. No significant differences between the fluvoxamine and placebo treated participants were apparent on any of the outcome measures, other than fluvoxamine treated participants showed greater improvements on the MOI (Hodgson & Rachman, 1977). The study concluded that as fluvoxamine and placebo performed similarly, fluvoxamine could not be supported as a treatment option for CB.

Ninan, McElroy, Kane, Knight, Bettina, Casuto, Rose, Marsteller and Nemeroff (2000) randomly assigned 23 patients to 13-weeks of double-blind fluvoxamine or placebo treatment conditions. The sample comprised individuals aged 18 to 65 years, with symptoms of problem buying behaviour present for 6-months or longer. Ninan *et al.*'s, (2000) findings are comparable to those of Black *et al.*, (2000), and found that fluvoxamine was no more effective in treating CB when compared to placebo in a 12-week, double blind, controlled trial. No significant differences were found between the active treatment or placebo groups on any measure of outcome, with a high placebo response rate observed.

#### 11.4. Critique of fluvoxamine treatment studies

The initial positive findings of Black *et al.*, (1997) that fluvoxamine offered a useful treatment option for compulsive buying, were not supported by later studies carried out by Black and colleagues (2000) and Ninan *et al.*, (2000) in trials of fluvoxamine versus placebo. In both cases, fluvoxamine performed comparably to placebo. Both studies employed a standardised, reliable and well validated measure of compulsive buying (YBOCS-SV, Monahan, Black & Gabel, 1996) and conducted statistical analyses of outcome. Black *et al.*, (1997) controlled for co-morbidity in participants, however Ninan *et al.*, (2000) did not exclude all co-morbid disorders (e.g. depression/anxiety), which may have influenced treatment outcome. The small sample sizes of both studies are problematic, and it is unclear from either study whether any power analysis (e.g. Kazdin & Bass, 1989) was undertaken. It may be the case that a failure to demonstrate treatment effects is a result of a weakness in statistical power, rather than with treatment efficacy.

#### 11.5. Citalopram<sup>7</sup> treatment

Koran, Bullock, Hartson, Elliot and D'Andrea (2002) reported initial findings of a 12-week, open label trial of citalopram. This study was replicated one-year later (Koran, Choung, Bullock and Smith (2003) in a 7-week, open label trial followed

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<sup>7</sup> Citalopram is a selective serotonin reuptake inhibitor (SSRI) frequently used in the treatment of depression (see Keller, 2000).



by a 9-week double-blind placebo-controlled discontinuation trial of citalopram. Participants in both studies were required to meet criteria for CB (McElroy *et al.*, 1994), have problematic shopping behaviour for at least 1-year and report shopping episodes of at least once per-week over last 3 months. A total of 24 participants (22 women and 2 men) completed the initial (2002) trial, and 24 participants (23 women and 1 man) completed the later trial. Results of the initial (2002) trial demonstrated that a mean daily dosage of 21.4mg of citalopram produced a rapid response rate, with 50% showing improvement in CB symptoms (interest in shopping, preoccupation with shopping, purchasing) by week two. A total of 38% of participants had end-of treatment YBOCS-SV scores of 0, and 21% had scores of 4 or less. In 54% of participants, CGI-I scores were 'very much improved', and in 17% 'much improved'.

Longer-term, three individuals remained symptom free without citalopram for a total of 5 months, whilst 7 individuals experienced a relapse in CB symptoms. Four of these 7 individuals who restarted citalopram treatment as a result, regained control over their CB symptoms. Despite positive outcomes, the authors speculated that the completion of shopping logs/diaries and therapist contact throughout the trial may have accounted for changes in symptoms (i.e. as a therapeutic effect). Furthermore, the lack of placebo comparison group prevented the examination of whether changes observed were in fact due to a placebo response.

In order to counter some of these initial methodological weaknesses, Koran, Choung, Bullock and Smith (2003) conducted a 7-week, open label trial followed by a 9-week double-blind placebo-controlled discontinuation trial of

citalopram over a period of one-year. All of the participants (n=24) initially received 20mg/d doses of citalopram, which was gradually increased over a period of two-weeks to 60mg/d, for a total of 7 weeks. Those who responded to citalopram at the end of the 7-week period (n=15) were then randomised to either 9-weeks of double-blind citalopram (n=7) or placebo (n=8) treatment. Koran *et al.* (2003) report 5 out of 8 (63%) individuals in the placebo group relapsed, compared to none of individuals who continued with citalopram treatment as usual (n=7). Those in the citalopram treatment group were rated “much improved” or “very much improved” on the CGI and had a 50% or greater decrease in YBOCS-SV scores. In this study, citalopram appeared to be an effective method of treatment for compulsive buying symptoms when compared to placebo in a double-blind trial.

#### 11.6. *Critique of citalopram treatment studies*

The results of the Koran *et al.*, (2003) study demonstrate that citalopram seems to offer a useful treatment option for CB.

The sample selection represents one of the main weaknesses of both studies as both employed opportunistic sampling via media advertisements. Samples obtained in this way may differ to clinical populations in terms of clinical presentation of CB and treatment motivation. Furthermore, although both studies did include males in their samples, (which is a strength over many other CB treatment studies), the numbers (n=1 and 2) are too small to allow generalisability to other males with CB. The small sample more generally (n=24) may be problematic and there is no indication of whether power analysis of sample size was conducted prior to undertaking statistical analysis. Despite

positive findings of citalopram in the Koran *et al.*, (2003) study, unfortunately no long term follow-up data are provided, which prevents any conclusions being drawn about the usefulness of this drug treatment over time.

### **11.7. Escitalopram treatment**

In a methodological replication of the Koran *et al.*, (2003) study, Koran, Aboujaoude, Solvason, Gamel and Smith (2007) used the SSRI escitalopram<sup>8</sup> in the treatment of CB. The sample comprised 26 women (mean sample age 45.1). Participants met CB inclusion criteria outlined by McElroy *et al.*, (1994) for at least 1 year, engaged in compulsive buying at least once per week for the last 6-months and scored 17 or more on the YBOCS-SV (Monahan *et al.*, 1996). Participants were started on an open-label 10mg/d dose of Escitalopram, which was increased to 20 mg/d after four-weeks for non-responders. After the first phase of the trial (7-weeks), individuals who responded to treatment, (defined as individuals with a CGI score of either 'very much' or 'much improved' and a YBOCS-SV score of less than 17 and 50% decrease from baseline) were then randomised to either 9-weeks of escitalopram or placebo. The study failed to find any differences between the escitalopram and placebo groups. Six out of 9 individuals in the placebo group relapsed, compared to 5 of 8 continuing escitalopram, and a number of participants in both treatment groups developed new depressive symptoms.

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<sup>8</sup> Escitalopram is an anti-depressant selective serotonin reuptake inhibitor (SSRI). It is recommended in the treatment of depression, Generalised anxiety disorder, panic disorder and social anxiety (see Cipriani, Furokawa, Salanti & Geddes, 2009).

### 11.8. *Critique of study*

This study has several methodological limitations. Of the 295 original enquiries to take part in the study, only 26 completed the trial (all of which were female), indicating a high drop-out rate. It may be the case that those individuals who chose to participate differed in important ways to those that did not (e.g. severity of CB symptoms). Furthermore, individuals with co-morbid diagnoses were not excluded, making it difficult to ascertain which were the primary symptoms being treated by escitalopram. The small sample size and lack of males limits the generalisability of the findings. Further, reliance on media advertisements increases the risk that the sample may differ from clinical samples with CB.

### **11.9. Mixed pharmacological treatments**

McElroy, Keck, Pope, Smith and Strakowski (1994) reported findings from the treatment of 20 patients with problematic buying behaviour. Patients were required to meet three compulsive buying criteria; (1) CB expressed as 'uncontrollable', (2) time-consuming and (3) a cause of social or financial difficulties. A total of 16 females and 4 males participated. A wide range of mood stabilizers (including lithium and valproate and antipsychotics) and antidepressants (including nortryptiline, fluoxetine, setraline and trazedone) were used alone or in combination. Complete or partial remission was observed in 55% of cases over a period ranging from 2 weeks to 13 months.

### 11.10. *Critique of study*

Despite the CB diagnostic tool developed as part of this study being subsequently widely used (e.g. Black, Monahan & Gabel, 1997; Koran, Bullock,

Hartson, Elliott & D'Andrea, 2002), the study does have methodological limitations. The diagnosis of CB is based on only three factors, and lacks adequate reliability/validity data, making it particularly difficult to establish severity and variability in CB symptoms or evaluate clinically significant change. Several other limitations exist. The study lacked any control or comparison groups, and did not employ randomisation. The unsystematic administration of drug treatments make it particularly difficult to establish which drug (or combination of drugs) could be responsible for the improvements in symptoms. High levels of co-morbidity were observed in the sample, and the sample lacked homogeneity in reported CB symptoms. Nine participants were also receiving psychotherapy during treatment, which may have been the overall mechanism of change in CB symptoms. No statistical analysis or data were presented relating to the outcomes of the study, making it difficult to draw conclusions around the clinical significance of the changes observed in some of the participants. Furthermore, a lack of follow-up data negates any opportunity to examine the long-term effectiveness of the treatment, in those participants who reported remission in compulsive buying symptoms.

### 11.11. Naltrexone<sup>9</sup> treatment

Grant, (2003) described three cases of CB treated with naltrexone (100-200 mg daily). Two females (aged 28 and 32 years old) and one male (aged 43 years old) completed treatment over a period ranging between 10-32 weeks. Duration of CB ranged from 2-9 years across the cases. In all 3 participants, a partial or complete remission of CB symptoms (e.g. self reported urge to shop) was reported within 1-4 weeks following commencement of Naltrexone (up to maximum dose of 200mg/d in one case). All participants reported a relapse in CB symptoms on Nalrexone withdrawal. Longer-term, the author reports that when Naltrexone treatment was re-administered, control of CB symptoms was observed in all three cases up to between 8 and 32 weeks.

### 11.12. *Critique of study*

In this case, treatment with naltrexone appeared to produce rapid results in the alleviation of CB symptoms. However, the study has a number of clear limitations. The sample size is particularly small (n=3), and it is unclear how the sample were selected, nor which specific diagnostic criteria were used in the diagnosis of CB, limiting the generalisability of the findings. There was no long term follow-up, nor any relevant outcome data other than self-reported 'urge to shop', making it hard to assess the long-term effectiveness of the method of treatment. No randomisation was employed; making it possible that outcome is attributable to placebo effect.

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<sup>9</sup> Naltrexone is an opioid antagonist. It is typically used the treatment of alcohol and drug dependence, but also has also been examined as a treatment of a variety of psychiatric disorders including self-harm (see Modesto-Lowe & Van-Kirk, 2002 for a review of treatment applications of Naltrexone).

### 11.13. Topiramate<sup>10</sup> treatment

Guzman, Filomensky and Taveres (2007) provide a case report of a 37 year-old woman with CB treated with topiramate. The patient was receiving outpatient treatment for CB and depressive disorder, which had previously been unsuccessfully treated with fluoxetine. The patient reported that CB onset was around 3-years prior to treatment, with CB taking up at least 10 hours a day.

The study reports that the patient was originally treated with venlafaxine up to 225mg/d, which after 3 months demonstrated no reduction in CB or depressive symptoms. Topiramate was then added (50mg/d up to 150mg/d within 1 month). The authors report that one-month after topiramate was added, the compulsive shopping 'subsided', and depression 'remitted'. The venlafaxine was then discontinued.

### 11.14. Critique of study

There are a number of methodological limitations with this study. Firstly, the study is limited by the sample size of a single patient which significantly limits the generalisability of the findings to other populations. No statistical analyses were conducted, and findings reported are based on self-reported reduction of CB and depressive symptoms. Guzman *et al.*, (2007) report using 'semi-structured' interviews to assess symptoms, but no details of these were provided and it is unclear how compulsive buying was formally diagnosed, or

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<sup>10</sup> Topiramate is an anti-convulsant typically used in the treatment of epilepsy migraine (see Vikelis & Rapoport, 2010 for a review). However, it has been investigated in the treatment of other clinical disorders, including alcohol dependence (see De Sousa, 2010 for a review), kleptomania (e.g. Dannon, 2003) and post-traumatic stress disorder (e.g. Mello, Yeh, Barbosa, Braga, Fiks, Mendes, Moriyama, Valente, Costa, Mattos, Bressan, Andreoli, & Mari, 2009).

whether diagnosis was based on clinical opinion only. Due to the lack of experimental control, it cannot be concluded that topiramate accounted for changes in the client's self-reported CB behaviour, since no randomisation or baseline was employed or established, and the topiramate was administered in conjunction with another medication, venlafaxine. Given the significance of the methodological problems, and lack of detail given within this report, it is not possible to conclude that topiramate could offer a useful treatment option for compulsive buying.

## **12. Summary of pharmacological treatment evidence**

In summary, results of pharmacological treatment studies for CB are mixed. Early studies of antidepressant treatments, used alone or in combination with other mood stabilizers (e.g. McElroy *et al.*, 1991; McElroy *et al.*, 1994) report success in treating CB symptoms. The antidepressant fluvoxamine showed benefit in reducing CB symptoms in an open label trial (Black *et al.*, 1997), however these findings were not supported by two later trials comparing fluvoxamine to placebo (Black *et al.*, 2000; Ninan *et al.*, 2000). A 12-week open label trial of the antidepressant citalopram (Koran *et al.*, 2002) demonstrated significant improvements in reduction of CB symptoms, results which were confirmed by a 9-week double-blind discontinuation trial of citalopram versus placebo (Koran *et al.*, 2003). Grant (2003) describes 3 cases which showed improvement in CB symptoms when treated with the opioid antagonist naltrexone; whilst Guzman *et al.*, (2007) describe successfully treating CB symptoms in one individual with a combination of the anticonvulsant topiramate and antidepressant venlafaxine.



Methodological limitations across studies; including small sample sizes, reliance on non-clinical samples, lack of standardised CB diagnostic criteria employed, high rates of co-morbidity, lack of follow-up data and furthermore the non-systematic implementation of drug treatments in some cases prevents viable conclusions being drawn. These methodological limitations need to be addressed, using larger randomised controlled trials for future research into pharmacological treatments for CB to progress.

### **13.COMBINED TREATMENTS<sup>11</sup>**

#### **13.1. Case reports**

Bernik, Akerman, Ameral and Braun, (1996) described the treatment of two women with CB (both whom presented with co-morbid panic disorder and agoraphobia) with fluoxetine. It is reported that both participants demonstrated either complete remission or 'complete control' over their CB in only 3-4 weeks, after exposure and response prevention treatment (including visiting places where purchasing most likely to occur, touching objects and being prevented from buying anything). Although the study provides some very limited description of treatment techniques used, it is not to the extent that would allow treatment replication. In addition, in the two cases reported, CB does not appear to be the primary symptom and there is no way of knowing whether the individuals would meet clinical diagnostic criteria for CB, since compulsive buying symptoms were only obtained via self-report.

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<sup>11</sup> Combined treatments refers to studies in which pharmacological and psychotherapeutic modalities have been combined as part of CB treatment.

Marcinko and Karlovic (2005) described a 32 year-old woman with CB who was successfully treated with a combination of fluvoxamine and individual cognitive-behavioural therapy. Similarly, it is particularly difficult to draw any firm conclusions regarding the findings reported in this study, given that it lacked any specific detail regarding the cognitive-behavioural techniques used, nor the length of treatment. However, the authors report that in this case, complete remission of CB episodes was maintained during the 12-month follow-up.

### 13.2. *Critique of case reports*

Both the Bernik *et al.*, (1996) and Markinko & Karlovic (2005) qualitative studies are based on either a pair or a single patient and lack adequate sample size. It is unclear how the treatments in either study were delivered, and fidelity to the treatment model was not assessed. The general lack of detail in either study negates attempts at replication and prevents conclusions regarding treatment effectiveness from being drawn.

### **13.3. Summary of combined treatments evidence**

As no experimental design was employed in either study, it is not possible to examine the exact mechanism of change in the reduction of CB symptoms. At the present time the evidence base for combined treatments for CB is particularly small and is not methodologically robust enough to draw firm conclusions regarding treatment effectiveness.

## **14. PSYCHOTHERAPEUTIC TREATMENTS**

### **14.1. Cognitive-Behavioural Therapy**

In recent years, there has been an increased focus in the application of psychological modalities of treatment for CB, particularly cognitive-behaviour therapy (CBT)<sup>12</sup>.

### **14.2. CBT case reports**

Two case reports provide evidence for CBT treatment of compulsive buying behaviour.

Kellett and Bolton (2009) report a case study detailing the application of their cognitive-behavioural treatment model, with a 36 year old female client meeting Faber & O'Guinn, (1992) CB criteria. The client completed fourteen 50-minute out-patient sessions (three assessment sessions, 10 intervention sessions, and one follow up session 6-months post-intervention). By session 10, a mutual decision to discontinue therapy was agreed, due to the client reporting control of CB symptoms. At the end of treatment, the client no longer met criteria for CB (Faber & O'Guinn, 1992), and made further progress over the follow-up period. Reliable improvements in shopping behaviours (as measured on the CAS and

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<sup>12</sup> Cognitive behaviour therapy is a therapeutic approach which aims to understand problems in terms of the relationship between thoughts, feelings and behaviours. In the United Kingdom, it is widely acknowledged as the treatment of choice for a range of emotional and psychiatric disorders, including depression, anxiety and obsessive compulsive disorder (see National Institute for Clinical Excellence (NICE) [www.nice.org.uk](http://www.nice.org.uk) website for full guidance.

YBOC-SV), and mental health (measured by the BDI-II and BSI) were also demonstrated at termination of treatment and 6-month follow-up.

Kellett and Robinson (2009) describe an ABC plus follow-up single case experimental design (SCED) of the treatment of a 40-year old woman referred for treatment of CB. The patient was treated using a combination of cognitive-behavioural therapy (treatment phase B) including exposure and response prevention and cognitive challenge; in addition to person-centred counselling (treatment phase C) over a total period of 23 sessions (assessment phase A = 3 sessions, treatment phase B = 13 sessions, treatment phase C = 6 sessions, follow-up phase FU = 1 session). Reliable reductions were observed across the range of outcome measures including the Beck Depression Inventory (BDI-II: Beck, Steer and Brown, 1995); Brief Symptom Inventory (BSI: Derogatis, 1987); Inventory of Interpersonal Problems (IIP-32: Barkham, Hardy & Startup, 1996); Compulsive Buying Scale (CBS: Faber & O'Guinn, 1992); YBOCS-SV (Monahan *et al.*, 1996) and Compulsive Acquisition Scale (CAS: Frost *et al.*, 1998); psychometric gains were maintained at follow-up. Outcome graphs of the experimental measures showed demonstrable reductions in shopping and obsessions and an improved sense of self over the phases of the study.

#### 14.3. *Critique of CBT case reports*

The small sample size (n=1) in both Kellett & Bolton (2009) and Kellett & Robinson (2009) studies limits the extent to which treatment outcomes can be generalised to other individuals with CB. However, the use of outcome measures is an improvement on earlier case studies outlined (e.g. Bernik *et al.*,

1996; Markinko & Karlovic, 2005), as is the use of single case experimental design (SCED), as it allows symptom change to be clearly delineated. However, due to the nature of standard clinical practice, the likelihood of demand characteristics (e.g. client trying to 'please' the therapist) may have influenced the overall outcome. Both studies indicate long-term outcomes of through gathering follow-up data, which has been lacking in extant CB case studies of this type.

#### **14.4. Group cognitive-behavioural therapy**

Mitchell, Burgard, Faber, Crosby and de Zwann, (2006) evaluated a manualised group CBT programme for CB (Mitchell & Burgard, 2000), compared to waiting-list control. A total of 39 women, who scored two or more standard deviations above the mean on the Compulsive Buying Scale (Faber & O'Guinn, 1992), participated. Twenty-eight (n=28) women were allocated to one of four CBT treatment groups. Eleven (n=11) were assigned to waiting list control. Therapy was conducted via 12, 1.5 hour sessions over 10-weeks. Twenty-one participants completed the treatment in full. Baseline comparisons showed significant improvement in all measures with large effect sizes noted on the CBS, YBOCS-SV and 4-week purchasing recall measure, with improvements maintained at 6-month follow-up. At follow-up, 10 participants reported a complete remission of CB episodes during the previous 4-weeks, compared to none of the participants assigned to the waiting list control.

In conclusion, this study has demonstrated a promising method of treatment for compulsive buying, with effects maintained at 6-month follow-up.

Mueller, Mueller, Silbermann, Reinecker, Bleich, Mitchell and de Zwann (2008) similarly compared the efficacy of Burgard & Mitchell's (2000) group programme versus waiting list control (WLC). Thirty-one participants who met McElroy *et al.*, (1994) CB criteria took part (mean sample age 41.3 years).

Twenty-five of the original 31 participants completed the CBT treatment, with 24 available for 6-month follow-up. Results showed significant differences between the CBT and WLC groups on the primary outcome measures (CBS, YBOCS-SV, and CBS) with the significant improvements in the CBT group maintained at 6-month follow-up. The CBT treatment did not have a significant impact on any of the secondary outcome measures (i.e. SCL-90-R, BIS-11 and SI-R). Higher rates of pre-treatment hoarding traits were significant predictors of non-remission of symptoms, in addition to poor treatment attendance.

#### 14.5. *Critique of group cognitive-behavioural therapy treatment studies*

Burgard *et al.*, (2000; 2006) have developed a CBT group therapy manual for the treatment of compulsive buying which appears to have made a positive impact on CB symptoms, with effects maintained at follow-up. Both Burgard *et al.*, (2000, 2006) and Mueller *et al.*, (2008) utilised a number of valid assessment measures, including the CBS, YBOCS-SV and the SCL-90-R. Randomisation in the group studies allowed the CBT treatment to be systematically compared to a waiting list controls, increasing the validity of the claim that group CBT offers genuine potential for the treatment of CB. Limitations of both studies are that the sample was drawn via opportunistic sampling (i.e. media advertisements); and individuals who self-selected to take

part in the study may differ in important ways to other individuals with CB who may not present for treatment (e.g. motivation). The characteristics of the therapist delivering the group treatment programme (or needed to deliver the programme) were not described, and fidelity to the treatment model was not assessed.

### **15. Summary of CBT treatment evidence**

In summary, empirical research regarding the efficacy and effectiveness of cognitive behavioural therapy (CBT) for the treatment of CB is gathering momentum. CBT has demonstrated effectiveness in the treatment of CB symptoms, across case studies (e.g. Kellett & Bolton, 2009), single-case experimental designs (Kellett & Robinson, 2009) and larger controlled trials (e.g. Mueller *et al.*, 2008). Treatment fidelity (ensuring the intervention delivered adheres to the treatment model) is an important aspect of delivering manualised treatments (as within Burgard *et al.*, and Mueller *et al.*, 2008 studies), and future research should address this important methodological issue. Criteria used to diagnose CB, in addition to outcome measures used are varied across studies, and the future standardisation of diagnostic criteria for CB would allow greater comparison between studies. A particular criticism of Burgard *et al.*, (2006) and Mueller *et al.*'s., (2008) sampling procedures is the reliance on opportunistic methods via media advertisements. Greater emphasis should be placed on gaining samples via clinical referral or comparing community and clinical populations, as there may be important differences in the manifestations of CB symptoms amongst these groups.

## 16. Family therapy treatment

Park, Cho and Seo (2006) report findings of family therapy treatment<sup>13</sup> of a 24-year old female with CB. Fifteen family therapy sessions (comprising of a mix of individual, parental, family and telephone-based sessions) were conducted. Sessions were audiotaped/videotaped and analysed qualitatively, using grounded theory (Glaser & Strass, 1967; Strauss & Corbin, 1998).

Results suggested six key factors related to CB; communication issues with family members; sibling relationships; mother's parenting and communication style; interpersonal relationships and stress. A number of factors which were reported to influence the change in the client's CB, including better communication with her family, developing closer sibling relationship, a change in her mother's parenting style, positive interpersonal relationships within the family and decreased family stressors.

### 16.1. *Critique of study*

This study provides a useful analysis of the treatment of CB within the family context (which is under-represented within the general literature in CB) but has several methodological limitations. Diagnostic criteria used to identify CB, or details of how the patient was selected for treatment are not reported. Details of

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<sup>13</sup> Family therapy is a type of psychotherapy which considers the impact of wider familial relationships and dynamics upon individual psychological and emotional wellbeing (e.g. Dallos & Draper, 2000).



any relevant outcome measures of CB or related psychiatric problems that were employed are lacking. The family therapy approach used and/or any techniques utilised was not described, and fidelity to the family therapy models unassessed making this study difficult to replicate. No details regarding co-morbid diagnoses which may have been present in the individual treated were given. In addition, this study was conducted within South Korea, which may limit the generalisability of the findings to other cultures.

### **17. Summary of family therapy treatment evidence**

In summary, the evidence base for family therapy treatment is particularly small. Whilst the individual study of Park *et al.*, (2006) reports that family therapy was beneficial in the treatment of CB, the study lacks methodological robustness from which to draw viable conclusions.

## **18. LIMITATIONS OF RESEARCH**

### *18.1. Classification and conceptualisation of compulsive buying*

Consistent agreement regarding the classification and conceptualisation of CB remains elusive; whether CB is best understood as an impulse control disorder, part of the obsessive-compulsive spectrum or merely a social artefact, is still highly contested. The current divide regarding the classification of CB is problematic, in that treatments should be dependent on the development of an empirically based conceptual model. Over recent years, tentative models (e.g. Kellett & Bolton, 2009) have begun to emerge, which have synthesised the available empirical evidence into a conceptual framework which is hoped will

offer clinical utility in the understanding and treatment of this disorder. Kellett and Bolton (2009) proposed a cognitive-behavioural model of CB which organises the CB evidence around 4 key areas: (1) '*antecedents*' including evidence suggesting persons with CB are more likely to have had difficult childhood experiences (e.g. neglect, abuse, critical parenting styles and low self esteem), or received parental care and attention via material gifts e.g. money or 'treats'; (2) '*internal/external triggers*' including internal psychological processes (e.g. low mood, dissatisfaction with body image, tension and anxiety which typically seem to proceed compulsive shopping episodes, as well as external triggers (e.g. the design of retail environments themselves which actively encourage purchasing); (3) '*The act of buying*' - cognitive and emotional changes resulting from the act of buying, (e.g. narrowed attention, poorer information processing and dissociative states) and (4) '*post-purchase*' evidence that compulsive buyers typically experience a range of negative emotions and behaviours following shopping binges.

## 18.2. *Sampling issues*

Many of the treatment samples reported present with significant levels of co-morbidity. Whilst some studies have included and treated patients with co-morbid conditions as part of their compulsive buying (e.g. Black *et al.*, 1997; Black *et al.*, 1998; Koran *et al.*, 2002, Koran *et al.*, 2003; Koran *et al.*, 2007; McElroy *et al.*, 1991; McElroy *et al.*, 1994; Mitchell *et al.*, 2006; Mueller *et al.*, 2008; Ninan *et al.*, 2000), others excluded patients with known co-morbidity (e.g. Black, 2000). Co-morbidity makes establishing which underlying clinical problem is actually being treated extremely difficult. Studies which attempt to

more stringently control for the presence of co-morbid conditions, or that compare outcomes of individuals with CB both with and without co-morbid conditions are required.

More outcome research is needed with male compulsive buyers, as males are significantly under-reported in the treatment literature (Kellett & Bolton, 2009), whilst being equally represented in terms of general prevalence (e.g. Black, 1996; Dittmar, 2004; Koran, Faber, Aboujaoude *et al.*, 2006). Further general research examining possible gender differences in CB phenomena is also clearly needed.

Almost half of all studies reported in the current review (43%) used opportunistic selection methods (e.g. media advertisement, word of mouth recruitment). Individuals who self-select to take part in treatment differ in important ways from those who do not in terms of clinical severity of problems and treatment motivation. More studies comparing community and clinical samples with CB are required.

### 18.3. *Measurement of compulsive buying*

Several studies employed the criteria outlined by McElroy *et al.*, (1994) in the diagnosis of CB. However others have relied on standardised clinical measures (e.g. YBOCS-SV; Monahan *et al.*, 1996) alone, or in conjunction with the McElroy (1994) criteria, or have relied purely on patient self-report of CB symptoms. Significant variability in the extent to which compulsive buying symptoms must be present for inclusion into research is evident. Some report CB symptoms must be present for 1-year or longer (e.g. Black *et al.*, 1997;

Black *et al.*, 2000; Koran *et al.*, 2003, 2007), whereas others have no strict inclusion criteria (e.g. Grant 2003; Guzman *et al.*, 2007; McElroy *et al.*, 1991; McElroy *et al.*, 1994). For future research to progress, the standardisation in the assessment /diagnosis of CB is needed.

#### 18.4. *Treatment fidelity*

There appears to be significant heterogeneity in treatment fidelity between studies. There has been some movement towards manualised treatments (e.g. Mueller *et al.*, 2008), however the fidelity by which these treatments were delivered has not been addressed.

#### 18.5. *Follow-up data*

Many of the studies reported (particularly pharmacological studies) have lacked follow-up data, which is problematic if any conclusive evidence regarding treatment effectiveness is to be established. Longitudinal data regarding treatment outcome is needed to help assess the impact of various treatments over time.

### **19. Conclusion**

CB outcome studies have been presented and critically reviewed. Treatments of CB have historically focused primarily upon pharmacological methods; however contemporary studies show a move towards more psychotherapeutic approaches. Both pharmacological and therapeutic modalities of treatment have shown some success in the treatment of CB (see Table 3 for effect size

calculations amongst CB pharmacological and psychotherapeutic outcome studies). In terms of pharmacological treatments, antidepressants (e.g. McElroy *et al.*, 1994), naltrexone (Grant, 2003), citalopram (Koran *et al.*, 2003) and topiramate (Guzman *et al.*, 2007) have shown positive results. However, only one study (Koran *et al.*, 2003) has sufficient internal validity to draw valid conclusions from. At the present time, cognitive-behavioural therapy has also shown promise in the treatment of CB, which has also been supported via controlled evidence (Mueller *et al.*, 2008). The progression of research from individual case reports to larger controlled trials is encouraging, in both pharmacological and psychotherapeutic studies. Future research comparing psychotherapeutic, pharmacological, and control groups would help to establish which treatment provides the greatest benefit.

Empirical research assessing variability in CB symptoms across different populations is lacking. Most research has been limited to female, community-based samples presenting with high levels of psychiatric co-morbidity. More research is clearly needed to establish whether there are important differences in how CB symptoms may manifest amongst under-researched samples (e.g. males, clinical populations), as well as between CB sufferers with and without co-morbid psychiatric conditions. Studies which directly compare clinical and community-based samples, males and females and individuals with and without psychiatric co-morbidity would aid our current understanding.

Developing a shared, operationalised definition of CB is crucial in the effective diagnosis, measurement, understanding and treatment of this clinical disorder. Theoretical models of compulsive buying (e.g. Kellett & Bolton, 2009) are

beginning to emerge, and this represents a positive step towards the establishment of a standardised framework from which to develop future psychological treatments. Biological theories of CB are currently absent, despite the pharmacological outcome evidence. More studies capturing the 'in vivo' cognitive, behavioural and emotional components of CB are now needed (e.g. see Kellett & Totterdell, 2008). Ecological momentary assessment techniques (see Smyth & Stone, 2003 for overview), including patient self-report and diaries recorded during shopping episodes, would enhance the outcome evidence-base (Kellett & Bolton, 2009 p.95).

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## **SECTION 2: RESEARCH REPORT**

# **An intensive time-series evaluation of the effectiveness of a cognitive-behavioural treatment for compulsive hoarding: A two-year prospective study**

## **INTRODUCTION**

Compulsive hoarding in humans may have an evolutionary basis (Kellett, 2007; Leckman & Bloch, 2008), and is observed across a variety of other species (Kellett, 2007). The accumulation of items (e.g. food) is both functional and adaptive, ensuring survival and reproductive success during times of decreased availability (Grisham & Barlow, 2005; Leckman, Mataix-Cols & Rosario-Campos, 2005). Putting together an ordered collection of desirable objects (e.g. records, toys, books) is for many a highly regarded and pleasurable pastime (Grisham & Barlow, 2005 p.45). For hoarders however, the reasons for saving or acquiring items appear irrational; objects seem to serve very little practical use and have no obvious theme (Frost & Hartl, 1996; Grisham & Barlow, 2005). Clutter and environmental chaos separates compulsive hoarding from everyday collecting and acquiring (Steketee & Frost, 2007), with the sheer volume of clutter creating often squalid and dangerous living conditions (Frost, Steketee & Williams, 2000).

Severe hoarding interferes with the basic activities of daily life; including cooking, cleaning, eating and sleeping (Grisham, Frost, Steketee, Kim & Hood, 2003; Steketee & Frost, 2003). Excessive clutter within the home environment is associated with significant health and safety risks, including poor hygiene and risk of fire (Frost, Steketee & Williams, 2000; Steketee, Frost & Kim, 2001).

Hoarding obviously has a negative impact upon family life, with carers and family members reporting frequent disruption to normal family life and conflict within their family relationships (Tolin, Frost, Steketee & Fitch, 2008; Wilbram, Kellett & Beail, 2008). Compulsive hoarding is a disorder often concealed by the sufferer (Kellett, 2007) and one which is frequently associated with significant personal shame and embarrassment, due to fear of negative evaluation regarding the state of the home (Kellett, Greenhalgh, Beail & Ridgway, 2010)

Currently there is no formal psychiatric DSM-IV-R (American Psychiatric Association, 2000) diagnostic criterion for compulsive hoarding (Steketee & Frost, 2007). Compulsive hoarding is typically identified via criteria developed by Frost and Hartl, (1996); 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 are sufficiently cluttered so as to preclude activities for which those spaces were designed; and 3) significant distress or impairment in functioning are caused by the hoarding. Compulsive acquisition of items and possessions is the primary feature of compulsive hoarding (Frost & Steketee, 1999; Pertusa, Frost, Fullana, Samuels, Steketee, Tolin, Saxena, Leckman & Mataix-Cols, 2010). Reasons for saving are typically comparable to those given by non-hoarders, including retaining items because of their perceived future usefulness, or sentimental value (Frost & Gross, 1993; Frost & Steketee, 1999; Furby, 1978). Amongst hoarders however, emotional investment in items is heightened (Kim, Frost, Steketee, Tarkoff & Hood, 2003) so that discard becomes fraught with anxiety, with possessions functioning as extensions of core identity (Frost & Skeketee, 1999).

### *Hoarding and Obsessive Compulsive Disorder*

The *Diagnostic Statistical Manual of Mental Disorders*, Fourth Edition (DSM-IV) (American Psychiatric Association, 1994) currently regards hoarding as a symptom of obsessive-compulsive personality disorder (OCPD), however, the exact nature of this relationship is highly contested (Pertusa *et al.*, 2010; Steketee, Frost, Tolin & Brown, 2005). The excessive doubt, reassurance seeking and checking associated with discard in compulsive hoarding, is believed to be similar to the compulsive rituals observed within obsessive-compulsive disorder. Furthermore, OCD symptoms have been found to correlate highly with compulsive hoarding behaviours in some individuals (e.g. Frost & Gross, 1993; Frost, Steketee, Williams *et al.*, 2000). However, many studies has failed to differentiate between hoarders with and without co-morbid OCD (Pertusa *et al.*, 2010), and therefore it is possible that such findings could in part be explained by co-morbid OCD symptomology amongst hoarders (Pertusa *et al.*, 2010), rather than reflecting a genuine association between OCD and compulsive hoarding. There have been recent calls to define OCD and compulsive hoarding as separate clinical entities (Pertusa, Fullana, Singh, Alonso, Mechon & Mataix-Cols, 2008; Pertusa *et al.*, 2010) and to distance compulsive hoarding from OCD in future diagnostic classification criteria (Mataix-Cols, Frost, Pertusa, Clark, Saxena, Leckman, Stein, Matsunaga & Wilhelm, 2010). The experience of both OCD sufferers and compulsive hoarders appears to be qualitatively different; compulsive hoarders do not typically experience their behaviour as an attempt to reduce distress or anxiety (as is often reported amongst OCD sufferers) and may instead see the

accumulation of objects as both comforting and pleasurable (Kyrios, Steketee, Frost & Oh, 2002; Kellett, 2007; Kyrios, Steketee, Pertusa *et al.*, 2010).

### *Treatment of compulsive hoarding*

Extant knowledge regarding the impact and long-term effectiveness of treatments for compulsive hoarding is limited (Steketee & Frost, 2003; Tolin, Frost & Steketee, 2007).

Efficacious treatments for OCD, including pharmacological, psychological (e.g. CBT based exposure and response prevention - ERP) and combined treatments (see NICE, 2005 for overview), have shown disappointing results in the treatment of compulsive hoarding (Steketee & Frost, 2003). In a sample of 150 patients with OCD treated with SRI's, the presence of hoarding symptoms predicted negative response (Mataix-Cols, Baer, Rauch & Jenike, 2000). Similarly, in a combined treatment study, Black, Monahan, Gabel, Blum, Clancy and Baker, (1998) reported that in 38 individuals with OCD treated with paroxetine and CBT, outcomes were significantly poorer amongst those with hoarding symptoms than without (16% versus 67%, respectively). Abramowitz, Franklin, Schwartz and Furr (2003) reported significantly poorer response rates for OCD hoarders with ERP treatment compared to those for individuals without hoarding symptoms. Individuals with co-morbid hoarding symptoms are more likely to drop out of treatment, compared to those without (Ball, Baer & Otto, 1996; Mataix-Cols, Marks, Greist, Kobak & Baer, 2002). Compulsive hoarding is ego-syntonic; hoarders see their thoughts, feelings and behaviour as rational; and analogous to beliefs they hold about themselves and their identity (Frost & Steketee, 1999; Steketee & Frost, 2003). Compared to individuals with OCD,

who recognise the irrationality in thoughts and compulsions, there is often a resistance to seek or engage with treatment amongst hoarders (Frost & Gross, 1993) due to lack of insight and/or denial of the severity of their difficulties (e.g. Pertusa *et al.*, 2010; Steketee & Frost, 2003; Tolin, Fitch, Frost & Steketee, 2010). The internal motivation or will to engage with or complete treatment programmes is often absent (Steketee & Frost, 2003; Tolin, Frost & Steketee, 2007). Often, it is only via the pressure exerted by family members or professionals (e.g. local housing authorities), that hoarders present in mental health services (Christensen & Greist, 2001; Greenberg, 1987).

In recent years, there has been a move towards the treatment of compulsive hoarding as a unique clinical disorder (Steketee & Frost, 2003). Primarily, the majority of research concerning the treatment of compulsive hoarding as a distinct from OCD, has focused on the application of the cognitive behavioural therapy (CBT) model of compulsive hoarding developed by Frost and Hartl, (1996). The model proposes compulsive hoarding is associated with deficits in four main areas, namely; (1). *Vulnerability Factors* Information processing (e.g. problems with the organisation and categorisation of objects and decision making) in addition to core beliefs about self, core personality traits and underlying/co-morbid mood disorders or past trauma; (2). *Beliefs/Attachment* Beliefs about attachment to objects (e.g. overinflated emotional attachment to possessions) in addition to beliefs about vulnerability, personal responsibility, memory and control; (3). *Emotional Reactions* Both positive and negative emotions resulting from hoarding including pleasure, pride, sadness, grief and shame; and (4). *Hoarding Behaviours* Reinforced by positive or negative



emotions when thinking about or attempting to discard particular objects; leading to avoidance behaviours.

Specialised CBT treatment for compulsive hoarding has evidenced effectiveness in the small number of psychological studies published (Cermele, Melendez-Pallitto & Pandina, 2001; Frost, Steketee & Greene, 2003; Hartl & Frost, 1999; Kellett, 2006; Murnoff, Steketee, Rasmussen, Gibson, Bratiosis & Sorrentino, 2009; Steketee, Frost, Winze, Greene & Douglass, 2000; Tolin, Frost & Steketee, 2007; Turner, Steketee & Nauth, 2010). Improvements have been noted across a range of hoarding related outcome measures, including visual ratings of clutter (e.g. Cermele *et al.*, 2001; Hartl & Frost, 1999; Murnoff *et al.*, 2009; Steketee *et al.*, 2000; Tolin *et al.*, 2007; Turner *et al.*, 2010), the Yale-Brown Obsessive Compulsive Scale (Frost & Steketee, 1999; Frost, *et al.*, 2003; Steketee *et al.*, 2000) and Saving Inventory-Revised (Muroff *et al.*, 2009; Tolin *et al.*, 2007). Reliance on small samples, inclusion of individuals with co-morbid diagnoses (e.g. Steketee *et al.*, 2000), poor standardisation of treatment protocols and limited or non-existent follow-up data are common methodological weaknesses. CBT treatment for individuals who hoard is primarily based on improving decision making skills, ability to sort and categorise objects, enhancing motivation, and restructuring maladaptive thoughts and feelings (e.g. sentimental attachment) associated with possessions. Home visits as an aspect of treatment has been hypothesised to aid progress and encourage discard (Nesiroglu, Bublick & Yaryura-Tobias, 2004; Steketee & Frost, 2007), although this has not been formally evidenced.

Typically, outcome studies published thus far have been small *n* designs, including case reports (e.g. Cermele *et al.*, 2001; Frost & Hunt, 2000; Frost, Steketee & Green, 2003; Kellett & Knight, 2003); single case experimental designs (SCED) (e.g. Hartl & Frost, 1999; Kellett, 2006) or small group and individual CBT programmes (Frost *et al.*, 1999; Steketee *et al.*, 2000; Tolin, *et al.*, 2007) including more recently, the individual treatment of 6 older adults with hoarding difficulties in a community setting (Turner, *et al.*, 2010). A preliminary trial of a larger CBT group programme, based on Tolin *et al.*'s (2007) pilot study with (*n*=32) clients (Murnoff, *et al.*, 2009) reported significant pre to post improvements on a number of hoarding outcomes. However, a high proportion of participants within the study presented with OCD symptoms, in addition to compulsive hoarding, (problematic for reasons discussed previously – see Pertusa *et al.*, 2010) and no follow-up data were collected, meaning the long-term benefit of this group programme could not be assessed.

Studies investigating the inter-relationship between cognitive, affective and behavioural factors during treatment, and their influence upon key environmental outcomes are currently lacking (Steketee & Frost, 2003 p.915). To address this issue, the current study utilised an intensive time-sampling method conducted over a 24-month period. The study measured diary ratings of cognitions, mood and hoarding via a single-case experimental design (SCED), with extended follow-up. SCED usefully assesses clinical change in disorders with a limited evidence base (Bower & Gilbody, 2010; Turpin, 2001).

The research hypotheses for the study were therefore:

H1: There will be reliable improvements in psychometric outcomes and environmental clutter between baseline, end of treatment and follow-up.

H2: There will be a significant increase in total volume of discard during outpatient therapy, outpatient therapy augmented by domiciliary visits and follow-up, compared to baseline.

H3: There will be a significant increase in incidence of discard during outpatient therapy, outpatient therapy augmented by domiciliary visits and follow-up, compared to baseline.

H4: There will be a significant increase in incidence rate of discard during outpatient therapy augmented by domiciliary visits over and above solely outpatient therapy, due to the addition of domiciliary visits.

H5: There will be reductions in hoarding related cognitions, behaviour and affect during outpatient therapy, outpatient therapy augmented by domiciliary visits and follow-up, compared to baseline.

## METHOD

### *Participant*

The patient was a 63-year old married woman, referred to a community mental health team due to a history of obsessive compulsive disorder (OCD) of the contamination type, compulsive hoarding and depressive symptoms. Primarily, the main presenting difficulty was compulsive hoarding and the patient was seeking help for this as a priority. The patient had a previous psychiatric history spanning 20-years and had sought treatment from both primary care and secondary care mental health services several times during this period. The patient reported difficulties with hoarding behaviour since her early life. Her hoarding behaviour had caused significant difficulties in her relationship with her husband and family and the patient reported feeling too ashamed of her home to allow her family and friends to visit. The patient had previously received 24 sessions of CBT for her OCD by a community nurse, which had failed to recognise or address compulsive hoarding symptoms and the patient dropped out of treatment. The patient lived in a 3-bedroom house with her husband. The patient's husband reported feeling afraid of upsetting his wife by intervening with removing clutter from the home. He reported he had passively accepted their home environment despite feeling frustrated by the negative impact it had on their marital relationship, relationships with other family members and the living environment they shared together. The home was observed to be moderately cluttered, although two rooms could not be entered due to the extent of clutter within them. Throughout the duration of the study, the patient was taking an SSRI anti-depressant, Citalopram 60mg/d.

## *Procedure*

### *Intervention*

The current study utilised an A, B, C plus extended follow-up (D) single case time-series design spread over 644 days (92 weeks). Table 1 describes the phases, duration and location of the study. The CBT assessment and treatment of the patient was completed by a British Association for Behavioural and Cognitive Psychotherapies (BABCP) accredited Consultant Clinical Psychologist. The intervention was based on a collaboratively developed individual case formulation, which drew upon the four-factor cognitive-behavioural model of compulsive hoarding outlined by Frost and Hartl, (1996). The formulation helped to direct the therapeutic sessions and enabled the patient to reflect on their hoarding difficulties. The purpose of the formulation was to enable the patient to understand the relationship between historical factors (e.g. early experiences), thoughts, feelings, avoidance and safety behaviours. The patient reported feeling incompetent in her abilities and had core beliefs of worthlessness and helplessness. The patient reported feeling submissive to those around her and believed she had little control in her life. The patient described feeling criticised by others and was generally mistrustful of others. The patient reported that she had hoarded possessions since her early life but this had accelerated during a previous marital breakdown. She reported saving objects due to their perceived future usefulness, often reporting something would 'come in handy' at a later date. The patient also frequently retained items for sentimental reasons; particularly children's toys and books because of the pleasant memories they triggered for her. The patient described

significant anxieties around her memory, fearing that if she did not keep objects close by she would forget about them or lose them. During the intervention the client displayed significant difficulties in being able to sort and prioritise objects for discard, and one component of the intervention involved helping the client speed up decision making around objects selected.

Table 1. SCED phases, durations and sessions

<b>SCED</b>	<b>Phase 1 (A)</b>	<b>Phase 2 (B)</b>	<b>Phase 3 (C)</b>	<b>Phase 4 (D)</b>
<b>Activity</b>	Baseline	Outpatient Therapy (OPT)	Outpatient treatment + domiciliary visits (OPT+DV)	Follow-up period
<b>Sessions</b>	Sessions 1-2	Sessions 3-25	Sessions 26-47	Sessions 48-51
<b>Duration</b>	4 weeks	35 weeks	30 weeks	23 weeks

Sessions 1 and 2 were completed as part of baseline assessment (A); sessions 3 to 25 comprised outpatient sessions (B); sessions 26-47 outpatient augmented by domiciliary visits (C); and sessions 48-51 patient follow-up (D). Therapy took place approximately once-fortnightly during the outpatient therapy (B) and twice weekly during therapy augmented by domiciliary visits (C). Both outpatient and domiciliary therapy sessions lasted 50-minutes in total. At the start of the assessment, a daily diary of mood, thoughts, feelings and behaviour related to hoarding was mutually designed and psychometric measures completed. Outpatient therapy (OPT) implemented the Steketee and Frost (2007) treatment manual for hoarding, in combination with an Object-Affect Fusion (OAF) protocol (Kellett & Knight, 2003).

The Steketee and Frost (2007) manual details procedures for 1. Psychoeducation around compulsive hoarding behaviour; 2. Training in speeding up decision making and categorisation of objects; 3. Exposure and habituation to discarding objects; and 4. Cognitive restructuring. The Object-Affect Fusion (OAF) (Kellett and Knight, 2003) procedure facilitated cognitive restructuring regarding hoarding possessions. The five stage procedure, outlined in Kellett, (2006) involved 1. *Identification*: Identification of objects selected for discard; 2. *OAF description*: Patient names the object and describes feelings, emotions and memories associated and fused with that object; 3. *Cognitive challenge*: Psychoeducation and cognitive challenge relating to emotional fusion associated with objects selected. The patient is introduced to the notion of separating objects from feelings, emotions memories and associations that the objects trigger; 4. *Affective expression* Therapeutic component whereby patient is encouraged to reflect and process unexpressed emotional affect (e.g. grief). Therapist supports patient in recognising and separating historical events and their own personal identity from material objects; and 5. *Developing a plan for discard* traditional CBT approach outlined by Steketee & Frost (2007) involving speeding up decision making regarding objects selected for discard, exposure to the act of discard and exposure to emotional consequences of discard.

#### *Assessment measures*

##### *Self-report*

Six measures were collected via a daily diary throughout the study, as described in Table 2. Daily diary recording offers a useful approach to examining within-person variability in mood and behaviour over time, in a way

which is not always achievable using other methods, such as formal psychometrics (Reis & Judd, 2000). Variables were mutually designed based upon integration of empirical research of factors salient in compulsive hoarding and patient choice, namely; rumination (e.g. Frost & Hartl, 1996; Steketee & Frost, 1998) hyper object sentimentality (e.g. Kellett & Knight, 2003; Kellett, 2006), depression (e.g. Grisham, Steketee & Frost, 2007), anxiety (e.g. Frost, Steketee, Williams & Warren, 2000), shame (e.g. Kellett *et al.*, 2010) and avoidance behaviour (e.g. Frost & Hartl, 1996).

Table 2. Diary hoarding variables

Construct	Diary item	Frequency	Scale
Past	'I've been living in the past today'	Daily	0 'not at all' to 9 'totally'
Sentimentality	'I've been sentimentally attached to my possessions today'	Daily	0 'not at all' to 9 'totally'
Depression	Today I have felt: 'depressed'	Daily	0 'not at all' to 9 'totally'
Anxiety	Today I have felt: 'anxious'	Daily	0 'not at all' to 9 'totally'
Shame	Today I have felt: 'ashamed'	Daily	0 'not at all' to 9 'totally'
Avoidance	'I have avoided throwing things away today'	Daily	0 'not at all' to 9 'totally'
Actual discard	'Please list below what you have thrown away today:'	Daily	Patient provided list of items discarded

### *Psychometric Measures*

The patient completed five self-report psychometric outcome measures at assessment, end of OPT, end of OP+DV and end of follow-up (see Appendix F):



*Beck Depression Inventory (BDI-II; Beck, Steer & Brown, 1995)*

The BDI-II is a 21-item measure designed to assess depressive symptomology (Beck *et al.*, 1995). Respondents rate depressive symptoms, ranging from 0 (not present) to 3 (severe), during the past two weeks. The BDI-II provides a single overall score from 0 to 63. Cut-off scores are suggested as: minimal (0–13); mild (14–19); moderate (20–28); and severe (29–63). Beck, Steer, Ball and Ranieri, (1996) report high internal consistency ( $\alpha = .91$  among psychiatric outpatients and  $\alpha = .93$  among undergraduate students) and good convergent validity with other measures (e.g.,  $r = .93$  with the BDI-IA and  $r = .71$  with the Hamilton Psychiatric Rating Scale for Depression).

*Brief Symptom Inventory (BSI; Derogatis, 1987)*

The BSI is a 53-item measure covering nine symptom dimensions: Somatization, Obsession-Compulsion, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation and Psychoticism. Three global indices of distress can be calculated: 1) Global Severity Index, 2) Positive Symptom Distress Index, and 3) Positive Symptom Total. The global indices measure current or past level of symptomatology, intensity of symptoms, and number of reported symptoms. Questions are on a 5-point scale, from 0 = "not at all", to 4 = "extremely". Internal consistency for the BSI is high, with alphas ranging from  $\alpha .71$  to  $\alpha .85$ , test retest reliability ranging from .68 to .91, and good convergent, discriminant, and construct validity (Derogatis, 1993). Derogatis (1992) suggests a t-score of >63 as a cut-off indicating significant distress and clinical caseness based on community norms.

*Inventory of Interpersonal Problems (IIP-32; Barkham, Hardy & Startup, 1996)*

The IIP-32 is a 32-item measure containing eight scales. Four measure deficits in interpersonal functioning (e.g. hard to be assertive), and four dysfunctional interpersonal strategies (e.g. too dependent). The eight subscales have demonstrated good internal consistency with alphas ranging from  $\alpha$  .72 to  $\alpha$  .90 (Barkham *et al.*, 1996) and test-retest reliability of .70 in a general population sample (Barkham, *et al.*, 1996). A score of >1.44 is the recommended cut-off for outpatient clinical caseness (Barkham *et al.*, 1996). For a full review of the psychometric properties of this item, see Hughes & Barkham, (2005).

*Compulsive Acquisition Scale (CAS; Frost, Kim, Morris, Bloss, Murray-Close & Steketee, 1998)*

The CAS is an 18-item scale that measures the strength of acquisition compulsions (CAS; Frost *et al.*, 1998). Two subscales can be calculated for the CAS; the CAS-Buy subscale (12 items) is a measure of compulsive buying behaviour and its consequences, the CAS-Free subscale (6 items) measures the compulsive acquisition of free things. Each subscale has been found to demonstrate adequate reliability ( $\alpha$  .90 and  $\alpha$ .83, respectively). Frost and Gross, (1993) and Frost *et al.*, (1995) report the CAS is a reliable and valid measure of hoarding behaviour across student, clinical and community samples (Frost *et al.*, 1998 p.659). A cut-off score of > 47.8 is recommended to differentiate clinically significant compulsive buyers from non-compulsive buyers (Frost, Steketee & Williams, 2002).

*Saving Inventory Revised* (SI-R, Frost, Steketee & Grisham, 2004)

The SI-R is a 23-item measure of compulsive hoarding behaviours relating to three main factors: 1. difficulty discarding, 2. excessive clutter and 3. excessive acquisition. The SI-R has been found to be a valid measure of hoarding behaviours in both clinical and non-clinical populations (Coles, Frost, Heimberg, & Steketee, 2003; Frost *et al.*, 2004) with good test-retest reliability and strong internal consistency ( $\alpha = .92$ ). Alpha coefficients for the three subscales exceed  $\alpha .87$ . A cut-off of  $> 40$  on the Total SI-R score is recommended to differentiate clinically significant compulsive hoarders from non-compulsive hoarders (Mueller *et al.*, 2007 p.2756).

#### *Clutter levels within the home*

Video data of footage of the home environment was gathered at baseline, end of OPT and end of OP+DV. A total of 6 videos were filmed (approximately 10 minutes in length) containing footage of the upstairs and downstairs areas of the home. Three independent raters were shown the 6 excerpts by the current researcher. Excerpts were randomised, and raters were blind to the stage of treatment shown in the videos. Excerpts were analysed and given an overall rating of 'clutter' by the 3 raters using the Clutter Image Rating (CI-R) tool (Frost, Steketee, Tolin & Renaud, 2008). Instructions for raters are in Appendix H. The CI-R has good internal consistency ( $\alpha = 0.84$  Frost *et al.*, 2008). For the current study purposes, the CI-R was used as a visual guide for raters as an assessment of clutter within the home as indicated on video footage. Inter-rater reliability was examined using intraclass correlation (ICC). Results show intraclass correlation between raters was high (ICC = .88). The total score of

clutter amongst the three raters was then averaged to provide a mean rating of clutter for the six videos: baseline (upstairs/downstairs); OPT: (upstairs/downstairs) and OPT+DV (upstairs/downstairs).

#### *Discard data*

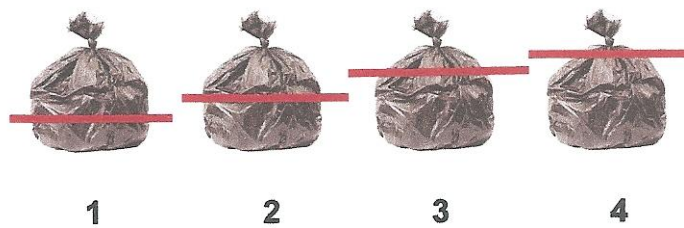
The patient recorded daily discard in the diary measure which was analysed using a system designed for the current study. Objects discarded each day were firstly assigned to one of three major categories: (1) information based objects (e.g. newspapers, leaflets etc.); (2) household waste objects (e.g. food, packaging etc.) and (3) clothing and footwear objects (e.g. shoes, trousers etc.). A frequency count of objects listed was then calculated, in addition to a total frequency count for each major category. Finally, the total volume of objects discarded daily overall (each category combined) was calculated using a Volume of Discard Scale (VDS) designed for this study (see fig. 1 for Volume of Discard Scale). The VDS is a visual 1-4 analogue scale designed to assess how much of a household refuse bag the items discarded would fill.

An inter-rater reliability analysis of the VDS ratings was undertaken with three raters (including the researcher) using a sample of 10-days of patient self-reported daily discard. Diary samples were selected if they contained a range of items listed, had variations in total volume and contained some items likely to be ambiguous in how they were categorised or counted. Each rater was provided with instructions for categorising and calculating frequency (see Appendix G), and provided with a VDS scale for each sample day. The task of each rater was as follows: 1) examine each daily discard recording 2) place

each item discarded within one of the three major categories; 3) calculate the frequency of that object; 4) calculate the total frequency of each major category; and 4) calculate the total volume of daily discard.

Internal reliability of discard categories was high for each category (information  $\alpha = .99$ ; household  $\alpha = .86$ ; clothing  $\alpha = 1.0$ ). VDS results demonstrated high internal consistency between raters ( $\alpha = .91$ ), indicating the VDS as a reliable measure of daily volume of discard.

Fig 1. Volume of Discard Scale



## RESULTS

All variables were screened for normality prior to statistical analysis. Data relating to categories of discard (i.e. information, household, or clothing objects) contained a number of outliers, which were removed. Outliers were pre-defined as any number greater than two standard deviations above the mean frequency totals. A visual inspection of frequency histograms for diary measures was then undertaken (see Appendix E). All daily diary variables were either positively or negatively skewed. Frequency of types of objects discarded each day and the total volume discarded was also skewed. This was caused by high levels of variability within daily discard frequency totals. A square root transform on the data failed to solve the problem. Dichotomising these variables would have led to information regarding the patient's pattern of discard being lost, and therefore a decision was made to proceed with the statistical analysis of these variables on the basis that the chosen parametric test (ANOVA) is robust to deviations from normality (Lindman, 1974).

Time-series data contains long-term trends and cycles both within and between variables which can lead to a misinterpretation of treatment effect, if not adequately accounted for (Reis & Judd, 2000 p.65). The issue of serial dependency concerns the phenomenon whereby individual observations (in the current case, daily diary ratings) may be influenced by previous recordings, or show similar patterns at certain intervals over time (Reis & Judd, 2000). If the time frame between measurement periods is small, the risk of previous data points influencing subsequent data points can be high and spurious correlations between study variables may emerge (Beal & Weiss, 2003). Creating a 'lagged'

variable, whereby each previous observation point in the time-series data is treated as an explanatory factor in the outcome of the analysis, can help to ensure each observation is treated as independent and control the risk of data becoming auto-correlated (Chatfield, 2000). Lagged variables for each data point in the current data set (specified as T-1 in SPSS syntax) were therefore created in SPSS to remove serial dependency.

Table 3 reports the means and standard deviations of the diary variables at baseline, OPT, OP+DV and follow-up.

A Pearson's correlation analysis of all diary measures during each phase was conducted (see Table 4). The most salient findings of the correlation analysis are reported below:

During baseline, living in the past was highly correlated with sentimentality ( $r(28) = .600, p < .01$ ); sentimentality was highly correlated with anxiety ( $r(28) = .685, p < .01$ ); and shame was highly correlated with depression ( $r(28) = .482, p < .01$ ). As treatment commenced during OPT, avoidance became highly correlated with anxiety ( $r(204) = .333, p < .01$ ), depression ( $r(204) = .348, p < .01$ ) and shame ( $r(204) = .424, p < .01$ ); associations which were maintained during OPT+DV but no longer significant at follow-up. During OPT, living in the past became highly correlated with ratings of avoidance ( $r(210) = .426, p < .01$ ), anxiety ( $r(208) = .452, p < .01$ ), depression ( $r(208) = .414, p < .01$ ) and shame ( $r(208) = .416, p < .01$ ) compared to baseline; associations which were maintained during OPT+DV. During the follow-up phase, living in the past was no longer

associated with sentimentality ( $r(140) = .139, p >.05$ ), and sentimentality no longer associated with anxiety ( $r(135) = .054, p >.05$ ). Depression remained highly correlated with shame ( $r(198) = .506, p <.01$ ), an association which was observed throughout the treatment phases OPT ( $r(210) = .470, p <.01$ ); OPT+DV ( $r(197) = .506, p <.01$ ).



Table 3. Descriptive statistics for patient variables during study phases

Variables	Baseline			Outpatient therapy			Outpatient therapy augmented by domiciliary visits			Follow-up		
	N	Mean	s.d	N	Mean	s.d	N	Mean	s.d	N	Mean	s.d
Living in the past	28	7.57	0.8	212	7.08	0.8	192	6.27	0.7	141	5.91	0.84
Sentimentality	28	7.71	0.8	211	6.91	0.7	192	5.89	0.6	140	5.40	0.56
Avoidance	22	7.59	1.0	210	6.54	0.6	191	5.70	0.6	140	5.38	0.64
Anxiety	28	7.89	0.8	212	7.48	0.7	200	7.29	0.6	137	6.70	0.70
Depression	28	7.71	0.7	212	7.40	0.8	200	7.29	0.7	137	6.72	0.65
Shame	28	7.53	1.0	212	6.93	0.7	199	6.89	0.7	137	7.05	0.61
Discard-information	28	.07	0.3	243	2.07	6.1	210	3.64	8.1	160	1.03	3.9
Discard-household	28	.14	0.4	243	1.97	4.1	210	4.16	6.9	160	4.10	6.9
Discard-clothing	28	.03	0.1	243	2.55	4.4	210	1.81	3.8	160	1.15	3.3
Discard volume	28	.28	0.8	243	1.91	1.5	210	2.06	1.6	160	1.73	2.0

Table 4. Correlation matrix of daily diary variables over study phases

**(A) Baseline**

Variable	1	2	3	4	5	6
1. Past						
2. Sentimentality	.600**					
3. Avoidance	.448	.277				
4. Anxiety	.030	.685**	.199			
5. Depression	.172	.325	.448*	.242		
6. Shame	.099	.430*	.527*	.456*	.482**	

\*\* <0.01, \* <0.05

**(B) Outpatient therapy**

Variable	1	2	3	4	5	6
1. Past						
2. Sentimentality	.521**					
3. Avoidance	.426**	.212				
4. Anxiety	.452**	.262**	.333**			
5. Depression	.414**	.392**	.348**	.215		
6. Shame	.416**	.368**	.424**	.537**	.494**	

\*\* <0.01, \* <0.05

**(C) Outpatient augmented by domiciliary visits**

Variable	1	2	3	4	5	6
1. Past						
2. Sentimentality	.479**					
3. Avoidance	.445**	.554**				
4. Anxiety	.340**	.310**	.289**			
5. Depression	.234**	.275**	.299**	.459**		
6. Shame	.158*	.169*	.225**	.386**	.506**	

\*\* <0.01, \* <0.05

**(D) Follow-up**

Variable	1	2	3	4	5	6
1. Past						
2. Sentimentality	.139					
3. Avoidance	-.026	.489**				
4. Anxiety	.371**	.054	.066			
5. Depression	.211*	.139	-.022	.476**		
6. Shame	.116	-.038	-.011	.343**	.565**	

\*\* <0.01, \* <0.05

### *Hypothesis 1*

To test the hypothesis that there would be a reliable change on outcome measures (i.e. BDI, BSI, IIP-32, CAS, SI-R) over time, the measures were analysed using the Jacobson and Traux (1991) formula. Table 5 describes outcome scores during baseline, OPT, OPT+DV and follow-up. Reliable change indices (RCIs) were significant between baseline and end of OPT for the BDI-II (RCI = 2.60,  $p < .05$ ), BSI-GSI (RCI = 2.69,  $p < .05$ ) and SI-R (RCI = 6.55,  $p < .05$ ) scores, but not for the IIP-32 or CAS scores. During OPT+DV, RCIs were significant for BDI-II (RCI = 2.31,  $p < .05$ ), CAS (RCI = 4.45,  $p < .05$ ) and SI-R (RCI = 3.07  $p < .05$ ), but not for the BSI-GSI or IIP-32 measures, compared to baseline. At follow-up, all measures with the exception of the IIP-32 showed reliable improvement compared to baseline; BDI-II (RCI = 8.38,  $p < .05$ ), BSI-GSI (RCI = 2.51,  $p < .05$ ), CAS (RCI = 5.94,  $p < .05$ ) and SI-R (RCI = 11.34,  $p < .05$ ).

An additional part of the analysis was to examine whether there were reliable changes in the visual levels of clutter within the upstairs and downstairs areas of the patient's home, as measured via the CI-R (Frost, *et al.*, 2008). Video data for the follow-up period was not collected, and therefore a comparison between OPT and baseline, and OPT+DV and baseline was conducted. During OPT, the RCI was significant for the upstairs area of the patient's home (RCI = 2.93,  $p < .05$ ), but not for the downstairs area of the home (RCI = 0.18,  $p > .05$ ), compared to baseline. This finding was replicated during OPT+DV; the upstairs area, but not the downstairs area, showed reliable change compared to baseline (upstairs RCI = 4.39,  $p < .05$ ; downstairs RCI = 0.35,  $p > .05$ ).

Therefore, the results of the first hypothesis can be partially supported; at the end of treatment, the patient showed significant improvements in levels of depression, general mental health, compulsive acquisition and saving, but not interpersonal functioning. Furthermore, changes in clutter were only significant for the upstairs area of the home.

Table 5. Scores on outcome measures during study phases

	Baseline	Therapy	Therapy plus domiciliary visits	Follow-up
BDI-II	41	32*	24*	12*
BSI-GSI	2.15	2.01*	2.20	1.37*
IIP-32	1.43	1.62	1.68	1.09
CAS	65	56	29*	29*
SI-R	86	42*	23*	16*
CI-R upstairs	7.33	4.66*	3.33*	-
CI-R downstairs	4.66	5.11	4.33	-

\*\*<0.01, \*<0.05

### *Hypothesis 2*

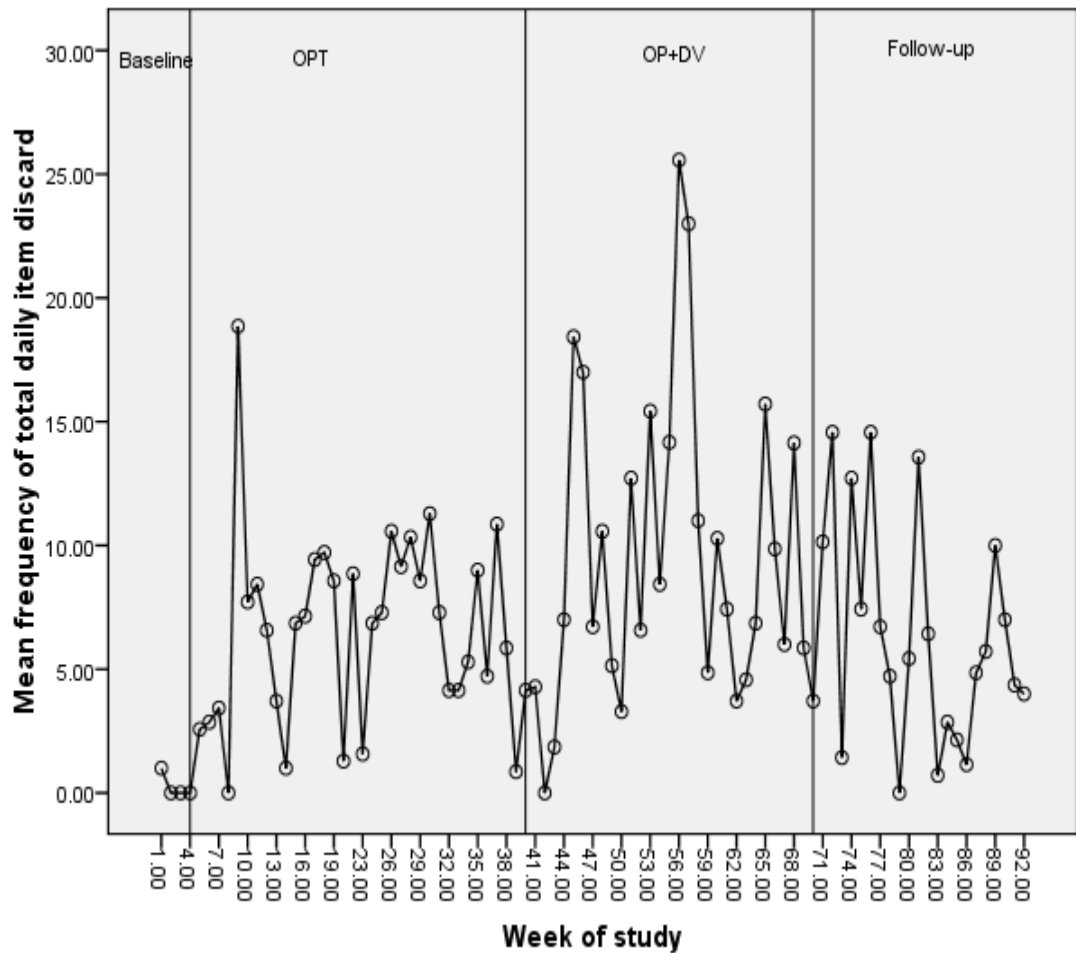
To test the hypothesis that there would be an increase in volume of discard during OPT, OPT+DV and follow-up compared to baseline, ANOVA was conducted, with volume of discard entered as the dependent variable, stage of treatment entered as the fixed factor and lag of volume entered as the covariate. Simple contrasts comparing therapy and follow-up with baseline were computed. Stage of treatment was significant for volume of discard  $F(1,635) = 4.5$ ,  $p < .01$  during all stages, with the patient showing an increase in daily

volume of discard compared to baseline during OPT ( $F(1,635) = 3.33, p < .01$ ); OPT+DV ( $F(1,635) = 3.60, p < .01$ ) and follow-up ( $F(1,635) = 2.89, p < .01$ ). In order to examine whether this finding could be accounted for via changes in the diary variables, the analysis was repeated with all diary variables (*past, sentimental, avoidance, anxious, depressed, and ashamed*) were entered as additional covariates. Stage of treatment remained significant for volume of discard during all stages; OPT  $F(1,28) = 3.52, p < .01$ ; OPT+DV  $F(1,243) = 3.29, p < .01$ ; and follow-up  $F(1,160) = 2.44, p < .05$ . However, several daily diary variables also remained significant; living in the past  $F(1,573) = 5.48, p < .05$ ; sentimentality  $F(1,571) = 10.68, p < .01$ ; avoidance  $F(1,563), p < .05$ ; and shame  $F(1,576) = 8.07, p < .01$ . Therefore results suggest that whilst total volume of discard increased as a result of therapy, this increase is likely to be partially accounted for by variables living in the past, sentimentality, avoidance and shame.

An additional aspect of discard analysis examined whether the overall frequency of objects discarded increased as a result of therapy. An ANCOVA was conducted, with the overall total of objects discarded each day entered as the dependent variable, stage of treatment entered as the fixed factor and the daily lag of overall discard entered as the covariate. Simple contrasts with baseline as the reference category were computed. Stage of treatment was significant for total daily frequency of discard  $F(3,636) = 11.76, p < .01$  during all study stages: OPT  $F(1,636) = 4.59, p < .01$ ; OPT+DV  $F(1,636) = 0.47, p < .01$ ; and follow-up  $F(1,636) = 2.77, p < .01$ ; compared to baseline. Figure 2 provides visual evidence of the overall mean frequency of objects discarded during each

week of the study. The data indicate overall mean frequency of discard is increased over all stages, compared to baseline. However the data also appears to show a downward trend towards decreased discard during follow-up.

Fig 2. Mean total frequency of discard over study phases



Type of objects discarded (i.e. information, household or clothing objects) during treatment phases was then compared to baseline. Cases of actual recorded discard were selected, and an analysis of covariance (ANCOVA) conducted. Type of discard was entered as the dependent variable, stage of treatment entered as the fixed factor and lag of the dependent variables entered

as covariates. Simple contrasts with baseline as the reference category were computed.

There was no significant difference between type of objects discarded (information/household/clothing) compared to baseline during OPT or OPT+DV. During follow-up, the patient showed a significant increase in ability to discard household waste objects compared to baseline ( $F(1,633) = 2.56, p < .05$ ), but information and clothing objects were non-significant.

Results of the analyses indicate that volume of discard increased as a result of treatment, supporting the second hypothesis. Additional analysis indicate increase in volume is partially explained by changes on daily diary variables living in the past, sentimentality, avoidance and shame. Daily frequency of discard increased as a result of therapy, but shows a downwards trend towards decreased discard during follow-up. The patient showed a significant increase in ability to discard household waste objects during follow-up, compared to baseline but no difference in ability to discard information or clothing objects.

### *Hypothesis 3*

To test the third hypothesis, a binary logistic regression was used to predict incidence of discard (patient did vs. did not discard items) from stage of treatment. Logistic regression analysis follows the same principles as linear regression, however the underlying assumption is that the dependent variable is dichotomous (Hosmer & Lemeshow, 2000), as in the current case. Incidence of discard was entered as the dependent variable and stage of treatment entered

as the predictor. The lag of incidence of discard was entered as the covariate. Simple contrasts with baseline as the reference category were conducted. The regression model as a whole was significant,  $X^2(3) = 108.21$ ,  $p < .01$ . Overall, the model classifies 69.7% of incidence of discard correctly (75% patient did discard, 62% patient did not discard). The Nagelkerke pseudo  $R^2$  measure was .211. Stage of treatment was significant at all stages: for OPT  $W^2 = 11.6(3)$ ,  $p < .01$ ; OPT+DV  $W^2 = 12.4(3)$ ,  $p < .01$  and follow-up  $W^2 = 5.4(3)$ ,  $p < .05$ . The odds in favour of the patient discarding were more than seven times higher during both OPT (7.13) and OPT+DV (7.72), with a reduction in likelihood during the follow-up stage (3.88). The results support the third hypothesis; incidence of discard increased during treatment and follow-up compared to baseline.

In order to examine whether the stage of treatment effects could be accounted for by the diary variables, the logistic regression analysis was re-run with all daily diary variables (*living in the past*, *sentimentality*, *avoidance*, *anxiety*, *depression* and *shame*) entered as additional covariates. Stage of treatment remained significant for OPT ( $W^2 = 12.05(3)$ ,  $p < .01$ ), OPT+DV ( $W^2 = 8.81(3)$ ,  $p < .05$ ), but not for follow-up ( $W^2 = 1.66(3)$ ,  $p > .05$ ). Of the daily diary variables, only living in the past ( $W^2 = 5.90(3)$ ,  $p < .01$ ) sentimentality ( $W^2 = 12.50(3)$ ,  $p < .01$ ) and avoidance ( $W^2 = 9.17(3)$ ,  $p < .01$ ) remained significant when entered into the model. This suggests that living in the past, sentimentality (i.e. sentimental attachment to objects) and avoidance (i.e. avoidance of discard) are partial mediators of incidence of discard (i.e. whether the patient does or does not discard). Results support the third hypothesis.



#### *Hypothesis 4*

To test the fourth hypothesis, that there would be a significant increase in incidence of discard during OPT+DV over and above OPT, due to the addition of domiciliary visits, a binary logistic regression was computed, with incidence of discard (patient did vs. did not discard) entered as the dependent variable, stage of treatment entered as the predictor and the lag of the dependent variable entered as a covariate. Repeated contrasts comparing OPT and OPT+DV were computed. Results show that there was no significant difference in the incidence of discard between OPT and OPT+DV ( $W^2 = .14 (1), p > .05$ ). A further ANCOVA was conducted to examine whether there were any significant differences in the total volume of objects discarded between OPT and OPT+DV. Volume was entered as the dependent variable, stage as the predictor and lag of volume entered as the covariates. Repeated contrasts indicated that there was no significant difference in the total volume of objects discarded between outpatient therapy and therapy augmented by domiciliary visits ( $t(1) = -0.61, p > .05$ ). Therefore the fourth hypothesis could not be supported; the addition of domiciliary visits did not have a significant impact on the patient's ability to discard, nor the total volume of items discarded.

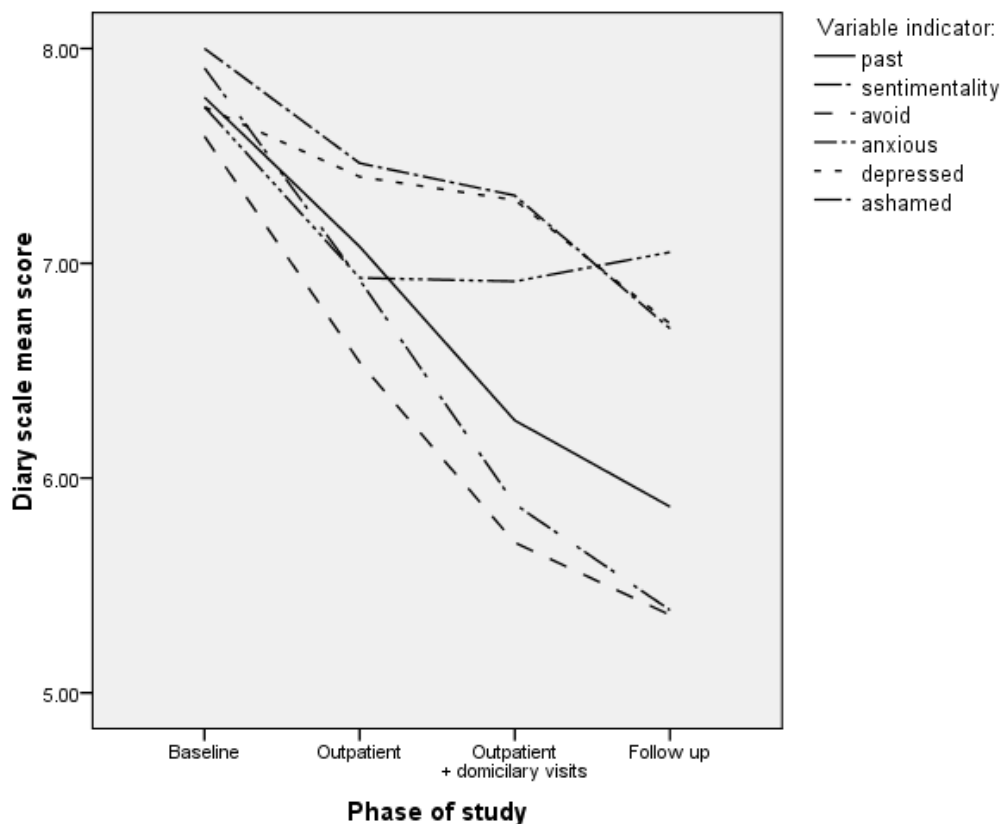
#### *Hypothesis 5*

To test the hypothesis that there would be reductions in hoarding related cognitions, behaviour and affect during OPT, OPT+DV and follow-up compared to baseline, ANCOVA was computed. All diary measures (*past, sentimentality, anxiety, depression, shame, and avoidance*) were entered as dependent variables, stage of treatment entered as the fixed factor and the lag of each

dependent variable entered as covariates. Simple contrasts with baseline used as the reference category were conducted.

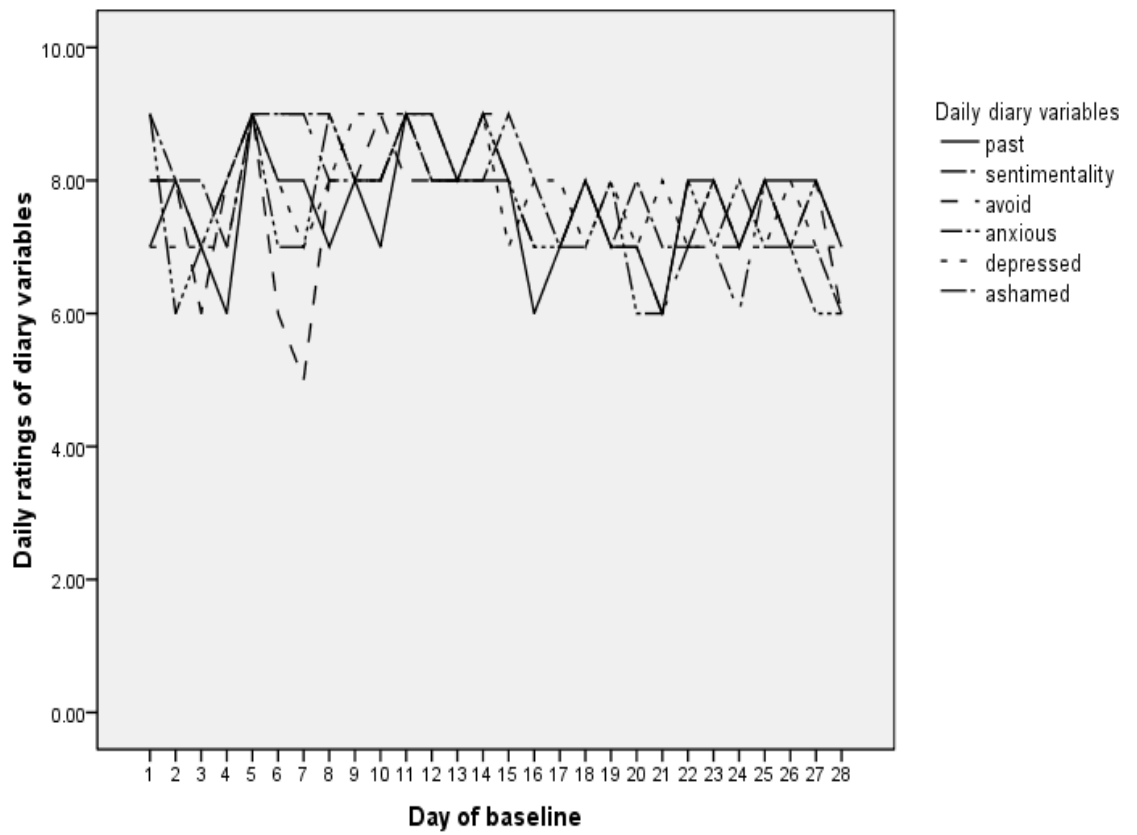
Figure 3 illustrates mean ratings of each diary measure during each stage. The graph indicates all diary measures have a downward trend, with the exception of shame which shows a downward trend between baseline and OPT and remains stable during OPT+DV. Shame then increases when therapy is ended during the follow-up period. All patient daily diary variables showed stability during the baseline stage (see Figure 4) indicating that factors were not responding solely to therapist contact.

Fig 3. Mean ratings of daily diary variables across study phases



Simple contrasts indicated that during the OPT stage compared to baseline, there was a statistically significant reduction in sentimentality towards possessions ( $M = 6.93$ ;  $t(1) = -3.32$ ,  $p < .01$ ), shame ( $M = 6.82$ ;  $t(1) = -2.49$ ,  $p < .01$ ), and avoidance of discard ( $M = 6.57$ ;  $t(1) = -3.42$ ,  $p < .01$ ), but not for ratings of living in the past ( $M = 7.57$ ,  $t(1) = -0.91$ ,  $p > .05$ ), anxiety ( $M = 7.48$ ;  $t(1) = -1.14$ ,  $p > .05$ ) or depression ( $M = 7.40$ ;  $t(1) = -0.44$ ,  $p > .05$ ). During the OPT+DV stage, there was a statistically significant reduction in ratings of living in the past ( $M = 7.08$ ;  $t(1) = -0.91$ ,  $p < .05$ ) sentimental towards possessions ( $M = 5.89$ ;  $t(1) = -6.58$ ,  $p < .01$ ), less avoidant of discard ( $M = 5.68$ ,  $t(1) = -5.98$ ,  $p < .01$ ) less shameful ( $M = 6.91$ ,  $t(1) = 2.27$ ,  $p < .05$ ), but not less anxious ( $M = 7.32$ ;  $t(1) = -1.08$ ,  $p > .05$ ) or depressed ( $M = 7.29$ ;  $t(1) = -0.31$ ,  $p > .05$ ), compared to baseline. During the follow-up stage, mean diary ratings showed decreased living in the past ( $M = 5.85$ ;  $t(1) = -2.96$ ,  $p < .01$ ), decreased sentimentality towards possessions ( $M = 5.40$ ;  $t(1) = -1.39$ ,  $p < .01$ ) and avoidance of discard ( $M = 5.37$ ;  $t(1) = -6.09$ ,  $p < .01$ ), in addition to decreased levels of anxiety ( $M = 6.68$ ;  $t(1) = -2.60$ ,  $p < .01$ ), compared to baseline. However there was no statistically significant difference in ratings of depression ( $M = 6.75$ ;  $t(1) = -1.43$ ,  $p > .05$ ) or shame ( $M = 7.08$ ;  $t(1) = -0.71$ ,  $p > .05$ ). The results of the fifth hypothesis can only be partially supported; whilst the therapeutic intervention appears to have resulted in statistically significant changes in patient ratings of living in the past, sentimentality towards possessions, avoidance of discard and anxiety in the follow-up period compared to baseline, it does not appear to have impacted on patient self-report of feelings of depression or shame.

Fig 4. Stability of patient ratings of daily diary variables during baseline



## DISCUSSION

### *Main findings*

The Object-Affect Fusion (OAF) informed CBT treatment protocol employed in the current study is an extension to existing recommended CBT treatments for compulsive hoarding (e.g. Steketee & Frost, 2007). The OAF component of treatment appears to have assisted the patient in separating from and discarding previously sentimental and emotional fused items and objects.

The intervention produced reliable improvements in measures of depression, general mental health, compulsive acquisition and saving. Clutter in the home however only showed reliable change in the upstairs area of the home. It is of note that clutter ratings were not collected during the follow-up stage, and as such the long-term impact of the intervention upon clutter could not be assessed, which is a study flaw.

Total volume of discarded items increased as a result of therapy. Results indicated that volume of discard was likely to be partially influenced by cognitive, behavioural and emotional factors, namely; rumination around past events, sentimental attachment to objects, avoidance behaviour and shame. Similarly, initiation of discard was also found to be influenced by rumination around the past, sentimentality and avoidance behaviour. Shame did not seem to impact upon whether or not the patient initiated discard overall.

The overall frequency of the patient's discard increased as a result of the intervention. A downward trend in frequency of discard during the follow-up phase suggests ability to discard may be difficult to maintain without on-going therapist support. A longer-term follow-up period would have helped to further clarify this finding.

Household waste objects were discarded more frequently than information based objects and clothing as a result of treatment. In this preliminary investigation, it could be speculated that household waste objects were perceived as less intrinsically valuable (e.g. Furby, 1978), less sentimental (e.g. Kellett & Knight, 2003; Kellett, 2006) and had less emotional attachment (e.g. Frost, Hartl, Frost & Williams, 1995) at the point of discard, than did the information objects or clothing. With no measure of intrinsic value, sentimentality or emotional attachment for each object discarded, it is not possible to confirm this. Further research examining 'in-vivo' observations of hoarding behaviour is thus warranted (e.g. see Smyth & Stone, 2003). This would help elucidate the cognitive and emotional components influencing decision making at the point of discard, in addition to capturing self-reported levels of emotional distress associated with particular objects or possessions.

Although domiciliary visits are hypothesised to enhance both treatment adherence and ability to discard in individuals who hoard (e.g. Nesiroglu, *et al.*, 2004; Steketee & Frost, 2007; Tolin *et al.*, 2007), this is the first study to examine the impact of additional domiciliary visits on hoarding outcomes. The

current study found no evidence to support the hypothesis that home visits would result in increased discard. Rates of discard did not differ significantly between the two phases of treatment, suggesting this may not be an essential component of hoarding treatment success.

*The role of cognitions, behaviour and affect in compulsive hoarding*

The OAF informed CBT intervention resulted in decreased cognitive rumination, sentimental attachment to possessions, anxiety and avoidance behaviour, but did not result in a decrease in depression or shame. Outcomes of depression did decrease however, on the formal BDI-II measure (Beck *et al.*, 1995). It may be the case that the conceptualisation of 'depression' on the patient self-report versus the standardised outcome measure differed in meaning for the patient, leading to variability in how this was rated. Furthermore, a global retrospective measure of depression may be more susceptible to memory bias towards positive emotional states than a daily self-report measure where mood is recorded 'in the moment'.

The current study adds to existing research relating to sentimental hoarding (e.g. Furby, 1978; Kellett & Knight, 2003; Kellett, 2006). Sentimentality was found to be associated with cognitive rumination around past events, anxiety, depression and feelings of shame during both treatment stages. During the outpatient augmented by domiciliary visits stage, sentimental attachment to objects became highly correlated with avoidance behaviour; an association which remained during the follow-up period. In the current case, it is possible

that rumination about the past was related to an increased sentimental attachment towards possessions (e.g. Frost, Hartl, Christian & Williams, 1995) creating difficulties at the point of discard. Objects appear to become 'fused' with emotional meaning and memories in compulsive hoarders (Kellett & Knight, 2003; Kellett 2006), with the discard of possessions likened to a grief response (e.g. Hartl & Frost, 1999; Warren & Ostrom, 1988). Possessions operate as safety signals during times of increased stress (Frost, 1995; Hartl & Frost, 1999), and when the home is threatened or violated (Kellett, 2007).

In line with previous research (Grisham, Steketee & Frost, 2007; Kellett *et al.*, 2010) high levels of depression and shame were reported in the current study during all stages, including follow-up. A highly significant correlation between shame, depression and anxiety as the treatment stage commenced, was particularly evident. Hoarders often attempt to conceal their difficulties, and report that allowing others into their home is experienced as shameful and embarrassing (Kellett, 2007; Kellett *et al.* 2010). In the present study, the increased focus on and confrontation of hoarding difficulties during treatment and the exposure to the therapist to during the domiciliary visits may have been accompanied by shame, anxiety and depression. Frost *et al.*, (1999) noted that anticipation of home visits and treatment appeared to trigger a hoarding 'state of mind', characterised by feelings of anxiety at the prospect of having to discard possessions (Hartl & Frost, 1999 p.460).



Diary ratings of shame remained high across study phases, despite discard rates with a further increase during the follow-up period. Achieving a significant decrease in shame therefore, whilst desirable may not be necessary for hoarding interventions to be effective.

### *Methodological considerations*

The single patient sample represents the main methodological weakness in the current study; results may not generalize to other individuals with compulsive hoarding. The results should therefore be considered as exploratory, and need to be replicated in much larger samples.

One particular methodological limitation is the treatment design. The OAF component ran across both the outpatient therapy (OPT) and outpatient augmented by domiciliary visits (OPT+DV) stages. It is not possible, therefore to specify whether OAF treatment (either over and above or in conjunction with CBT) was the primary mechanism for change. A different SCED design; A/B/C/D whereby B is CBT only; C is OAF only and D is CBT+OAF would have clarified whether OAF alone or as an adjunct to CBT is most effective in facilitating reduced hoarding.

The patient presented with co-morbid obsessive compulsive disorder (OCD), in addition to compulsive hoarding symptoms. The nature of the relationship between OCD and compulsive hoarding is still contested (e.g. Pertusa *et al.*, 2010). Differentiating between hoarders with and without co-morbid OCD in research samples is vital (Pertusa *et al.*, 2010) as this may necessitate and

dictate different treatment protocols. Whilst no attempts were made to treat the OCD in the current patient, the inclusion of an OCD measure (e.g. the Yale-Brown Obsessive Compulsive Scale (YBOCS; Goodman, Price, Rasmussen, *et al.*, 1989) to evidence stability or not of OCD symptoms would have been useful. As the patient was receiving pharmacological treatment for OCD symptoms via Citalopram, it is possible that this may have had some impact upon hoarding symptoms. Citalopram has found to be a useful treatment option for compulsive buying (Koran, Choung, Bullock & Smith, 2003); a condition thought to share significant association with compulsive hoarding (e.g. Frost & Gross, 1993; Frost & Hartl, 1998; Frost, Kim, Morris, Bloss, Murray-Close & Skeketee, 1998; Frost, Steketee & Williams, 2002; Mueller, Mueller, Albert, Mertens, Silbermann, Mitchell, & de Zwann, 2007). In the current case however, the baselines for discard variables were found to be stable, suggesting that changes observed were due to the psychological intervention, rather than ongoing pharmacotherapy.

The current study utilised a single-case experimental design (SCED) in the treatment of an individual compulsive hoarder within clinical practice. As previously highlighted, single-case methodologies are a useful and practical way of measuring change within conditions that are rare, or which have a limited evidence base (Bower & Gilbody, 2010; Turpin, 2001). Evidence derived from randomised controlled trials (RCT's) is often viewed as the 'gold standard' (Barkham, Stiles, Lambert & Mellor-Clark, 2010); considered by some to be more scientifically rigorous and robust than evidence derived from 'real-world'

settings (Wampold, 2009). Real-world research is seen as riddled with confounding variables than cannot be easily controlled or manipulated, and for this reason RCT's often adopt strict participant inclusion/exclusion criteria within their studies to reduce threats to internal validity (Bower & Gilbody, 2010). However, what RCT's may gain in internal validity, they may lose in *external* validity – that is the extent to which findings are generalisable to other individuals with similar difficulties seen within everyday clinical contexts (Bower & Gilbody, 2010). Whilst RCT research clearly has its benefits as an objective scientific methodology, the focus on this approach to the exclusion of other forms of evidence (e.g. case studies, SCEDs, behavioural observation) disregards the significant impact that real-world research can have in furthering the evidence base for an array of psychological difficulties (Barkham *et al.*, 2010). To some extent, it could be argued that SCED methodologies bridge the gap between RCT's and evidence derived from real-world research. Indeed, evidence from SCED methodology has been seen to be equivalent to that of RCT's (Chambless & Hollon, 1998). RCT's are resource and time intensive, and impractical to conduct in circumstances where clinical conditions or populations are rarely encountered (Bower & Gilbody, 2010), such as compulsive hoarding. SCED studies, on the other hand are inexpensive to implement and have the added benefit that they address the idiosyncratic needs of the particular patient being treated within clinical practice (Newall & Burnard, 2006). For future research to progress, the synthesis of research evidence gained via both evidence-based practice and practice-based evidence is now needed (Barkham *et al.*, 2010). This is likely to have a greater impact on the

knowledge base of efficacious treatments, not only for compulsive hoarding; but mental health and psychological difficulties more generally (Barkham *et al.*, 2010).

### *Conclusions*

The current study presented a 2-year insight into the on-going life of a compulsive hoarder, unique within extant empirical research. Compulsive hoarding is generally viewed as treatment resistant (Frost & Gross, 1993), with knowledge regarding the efficacy and effectiveness of treatment being limited (Steketee & Frost, 2003; Tolin, Frost & Steketee, 2007). The OAF informed CBT treatment employed was successful in increasing frequency, volume, and overall incidence of discard. Additional therapist home visits as a component of treatment did not appear to produce a significant difference in discard behaviour in this case. The patient demonstrated improvements in ratings of depression, general mental health, compulsive acquisition and saving. The present study both supports and adds to existing research regarding cognitive and behavioural factors implicated in hoarding (e.g. Frost & Hartl, 1996). Rumination, sentimentality, anxiety, avoidance and shame all appeared to be important factors in compulsive hoarding. The integration of both evidence-based and practice-based approaches in future studies of compulsive hoarding is now warranted, for our clinical understanding of this hard to treat disorder to progress.

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24 February 2010

Lisa Pollock  
Third year trainee  
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Dear Lisa

I am writing to indicate our approval of the journal(s) you have nominated for publishing work contained in your research thesis.

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Yours sincerely

A handwritten signature in black ink, appearing to be 'A. Thompson', written over a horizontal line.

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- Supply embedded graphics in your wordprocessor (spreadsheet, presentation) document;
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- Supply files that are too low in resolution;
- Submit graphics that are disproportionately large for the content.

### **Tables**

Number tables consecutively in accordance with their appearance in the text. Place footnotes to tables below the table body and indicate them with superscript lowercase letters. Avoid vertical rules. Be sparing in the use of tables and ensure that the data presented in tables do not duplicate results described elsewhere in the article.

### **References**

#### *Citation in text*

Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either "Unpublished results" or "Personal communication" Citation of a reference as "in press" implies that the item has been accepted for publication.

#### *Web references*

As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.

#### *Reference management software*

This journal has standard templates available in key reference management packages EndNote (⇒ <http://www.endnote.com>) and Reference Manager (⇒ <http://www.refman.com>). Using plug-ins to wordprocessing packages, authors only need to select the appropriate journal template when preparing their article and the list of references and citations to these will be formatted according to the journal style which is described below.

#### *Reference style*

*Text:* Citations in the text should follow the referencing style used by the American Psychological Association. You are referred to the Publication Manual of the American Psychological Association, Sixth Edition, ISBN 978-1-4338-0561-5, copies of which may be ordered from ⇒ <http://books.apa.org/books.cfm?id=4200067> or APA Order Dept., P.O.B. 2710, Hyattsville, MD

20784, USA or APA, 3 Henrietta Street, London, WC3E 8LU, UK. Details concerning this referencing style can also be found at <http://linguistics.byu.edu/faculty/henrichsen1/apa/apa01.html>.

*List:* references should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters "a", "b", "c", etc., placed after the year of publication.

*Examples:*

Reference to a journal publication:

Van der Geer, J., Hanraads, J. A. J., & Lupton, R. A. (2000). The art of writing a scientific article. *Journal of Scientific Communications*, 163, 51–59.

Reference to a book:

Strunk, W., Jr., & White, E. B. (1979). *The elements of style*. (3rd ed.). New York: Macmillan, (Chapter 4).

Reference to a chapter in an edited book:

Mettam, G. R., & Adams, L. B. (1994). How to prepare an electronic version of your article. In B. S. Jones, & R. Z. Smith (Eds.), *Introduction to the electronic age* (pp. 281–304). New York: E-Publishing Inc.

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One Author designated as corresponding Author:

- E-mail address
- Full postal address
- Telephone and fax numbers

All necessary files have been uploaded

- Keywords
- All figure captions
- All tables (including title, description, footnotes)

Further considerations

- Manuscript has been "spellchecked" and "grammar-checked"
- References are in the correct format for this journal
- All references mentioned in the Reference list are cited in the text, and vice versa
- Permission has been obtained for use of copyrighted material from other sources (including the Web)
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doi:10.1016/j.physletb.2003.10.071

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## APPENDIX C: ETHICS APPROVAL LETTER



### **National Research Ethics Service South Yorkshire Research Ethics Committee**

1st Floor Vickers Corridor  
Northern General Hospital  
Herries Road  
Sheffield  
S5 7AU

Telephone: 0114 226 9153  
Facsimile: 0114 256 2469  
Email: joan.brown@sth.nhs.uk

27 October 2009

Miss Lisa Pollock  
48 Regent Street  
Rotherham  
South Yorkshire  
S61 1HL

Dear Miss Pollock

**Study Title:** An intensive time-series evaluation of the effectiveness of a treatment for compulsive hoarding: A two-year prospective study  
**REC reference number:** 09/H1310/65  
**Protocol number:** 1

Thank you for your letter of 12 October 2009, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

#### **Confirmation of ethical opinion**

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

#### **Ethical review of research sites**

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

#### **Conditions of the favourable opinion**

The favourable opinion is subject to the following conditions being met prior to the start of the study.

**Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.**

For NHS research sites only, management permission for research ("R&D approval") should be obtained from the relevant care organisation(s) in accordance with NHS research

This Research Ethics Committee is an advisory committee to Yorkshire and The Humber Strategic Health Authority  
The National Research Ethics Service (NRES) represents the NRES Directorate within



governance arrangements. Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at <http://www.rdforum.nhs.uk>. Where the only involvement of the NHS organisation is as a Participant Identification Centre, management permission for research is not required but the R&D office should be notified of the study. Guidance should be sought from the R&D office where necessary.

Sponsors are not required to notify the Committee of approvals from host organisations.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

#### Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Covering Letter		07 August 2009
REC application		24 August 2009
Protocol	1	07 August 2009
Investigator CV		07 August 2009
Letter from Sponsor		07 August 2009
Referees or other scientific critique report		11 May 2009
Protocol Summary	1	07 August 2009
Supervisor's CV - Peter Totterdell	1	07 August 2009
Publications Summary	1	07 August 2009
Letter responding to points raised by committee in provisional opinion letter		12 October 2009
Copy of consent form signed by client agreeing to use of data in future research projects		01 September 2007
Copy of confidentiality agreement to be signed by raters		
Copy of email seeking volunteers		
IRAS page 23 - declaration for student projects signed by academic supervisor		
Response to Request for Further Information		
Participant Information Sheet: Raters	1	12 October 2009

#### Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

#### After ethical review

Now that you have completed the application process please visit the National Research Ethics Service website > After Review

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

The attached document "After ethical review – guidance for researchers" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

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- Notifying substantial amendments
- Adding new sites and investigators
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

We would also like to inform you that we consult regularly with stakeholders to improve our service. If you would like to join our Reference Group please email [referencegroup@nres.npsa.nhs.uk](mailto:referencegroup@nres.npsa.nhs.uk).

**09/H1310/65**

**Please quote this number on all correspondence**

Yours sincerely

*J Brown*

*pp* **Miss Jo Abbott**  
**Chair**

Enclosures: "After ethical review – guidance for researchers" SL-AR2

Copy to: R&D Department, University of Sheffield

Research Governance Co-ordinator, Bamsley Health & Social Care  
Research Alliance R & D Department, Block 12, Bamsley NHS  
Foundation Trust, Gawber Road, Bamsley, S75 2EP

This Research Ethics Committee is an advisory committee to Yorkshire and The Humber Strategic Health Authority

The National Research Ethics Service (NRES) represents the NRES directorate within  
The National Patient Safety Agency and Research Ethics Committees in England

## APPENDIX D: RESEARCH GOVERNANCE APPROVAL

### LETTER



Your Ref:

Our Ref: SB/AS/ ResGov/23Nov09/02

Please ask for:

24 November 2009

Lisa Pollock  
Trainee Clinical Psychologist  
University of Sheffield  
Western Bank  
Sheffield  
S10 2TP

Dear Ms Pollock

Longfields Court  
Middlewoods Way  
Wharnccliffe Business Park  
Carlton  
Barnsley  
S71 3GN

Direct dial: 01226 327204

#### **An intensive time series evaluation of the effectiveness of a treatment for compulsive hoarding**

Thank you for submitting the above project. The project was considered by the Research Governance Committee of Barnsley Health and Social Care Research and Development Alliance at a meeting on 23 November 2009 and I am pleased to confirm that the committee agreed to approve the project.

Please note that in agreeing to act as Principal Investigator for Barnsley on this project, you are accepting responsibility for making sure that informed consent and procedures approved by the ethics committee are adhered to.

Any changes or new information which would raise questions about the continued conduct of the research must be notified to the research office immediately.

Basic information on the project will be entered into the Trust's research database and may be submitted to the National Research Register. The research office may seek further information from time to time in order to fulfil the information requirements of the Trust or NHS Executive.

I should be grateful if you could provide a brief annual report on the progress of the research to the Research Office, including reference to any publications that have arisen from the research. This report should be submitted during March each year, so that pertinent information can be included in the Trust's Annual Research Report.

Yours sincerely

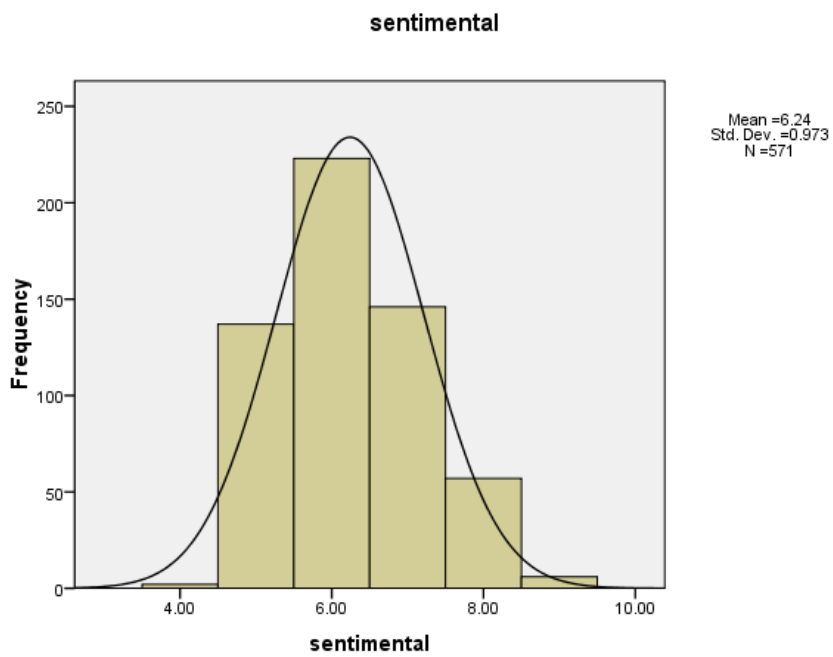
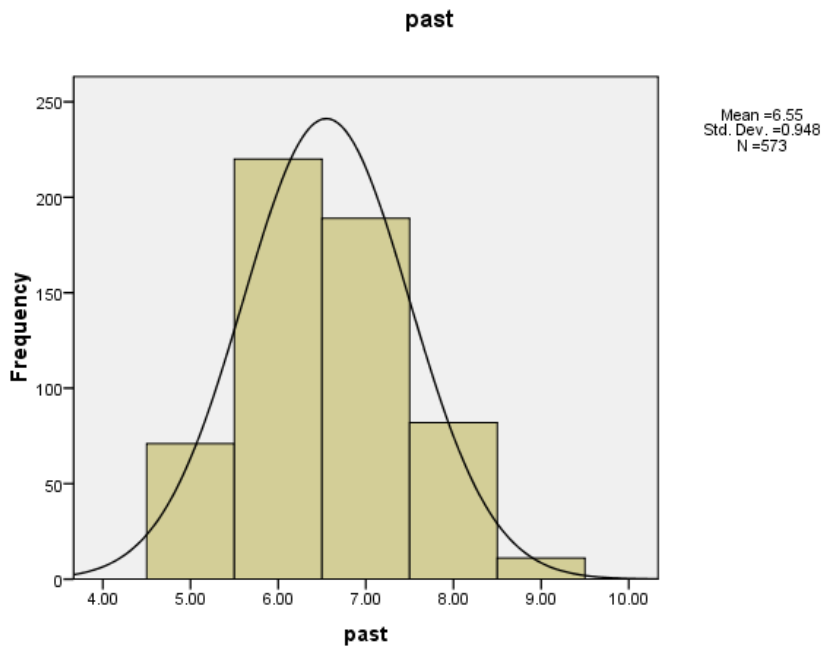
Sue Bentley  
Director of Performance and Governance

Cc: Research Governance Office, BHNFT

NHS Barnsley, local leader of the NHS. The legal name of NHS Barnsley is Barnsley PCT.  
NHS Barnsley Headquarters: Kendray Hospital Doncaster Road Barnsley South Yorkshire S70 3RD  
Chairman: T D Sheard, Chief Executive: Ailsa Claire B.A. M.A.

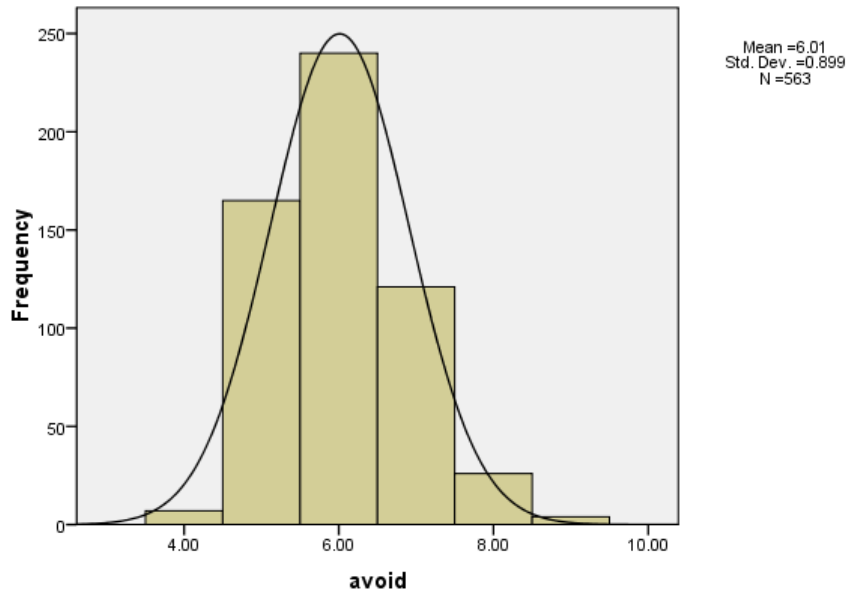


## APPENDIX E: FREQUENCY DISTRIBUTIONS OF DAILY DIARY AND DISCARD VARIABLES

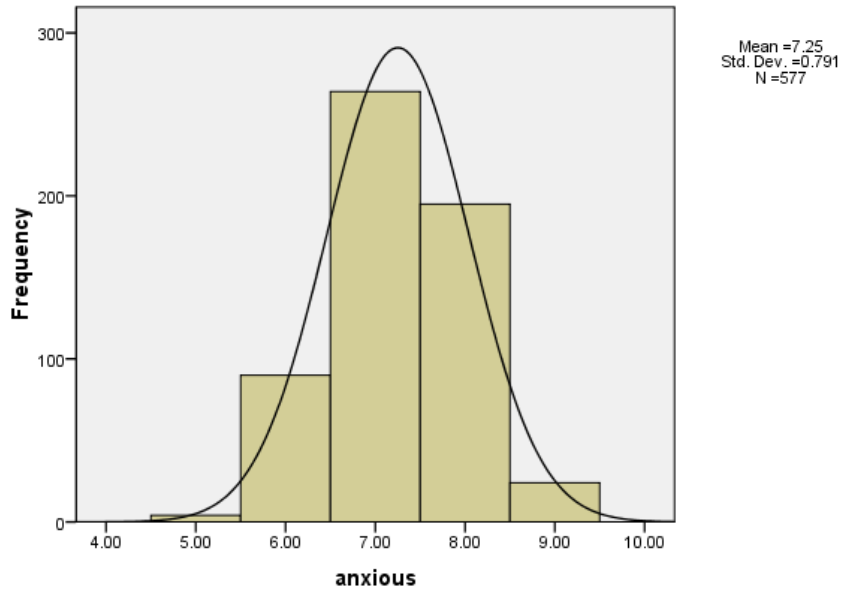




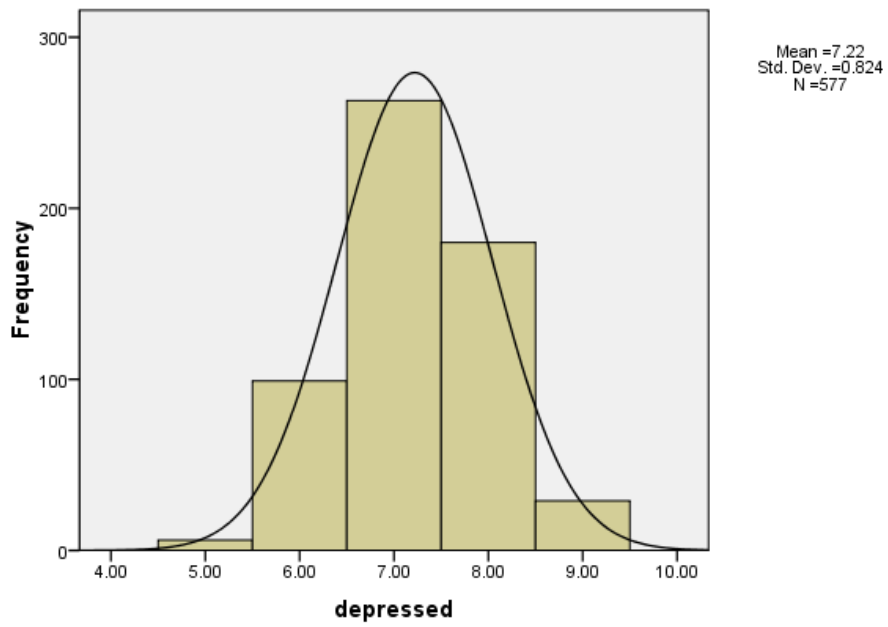
**avoid**



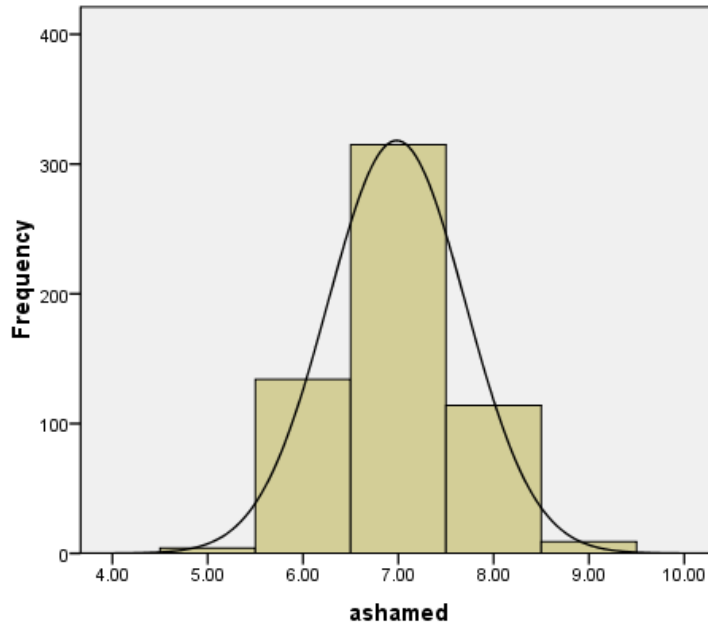
**anxious**



**depressed**

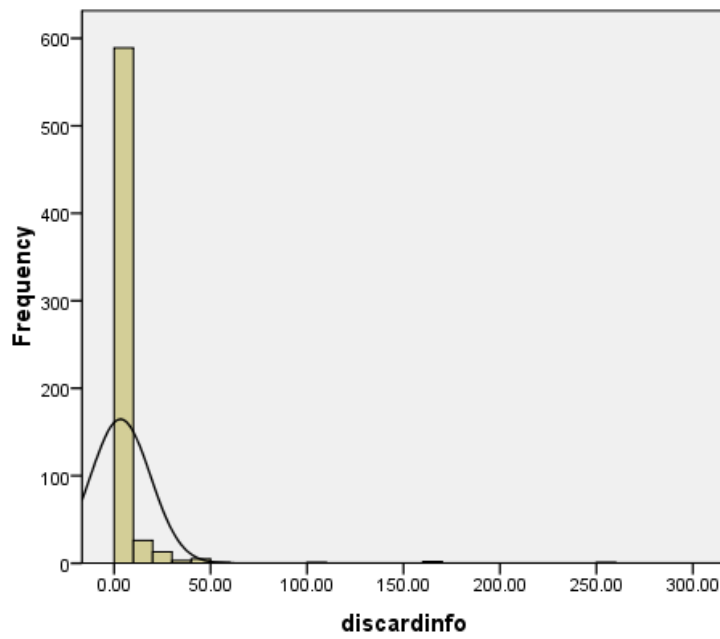


**ashamed**



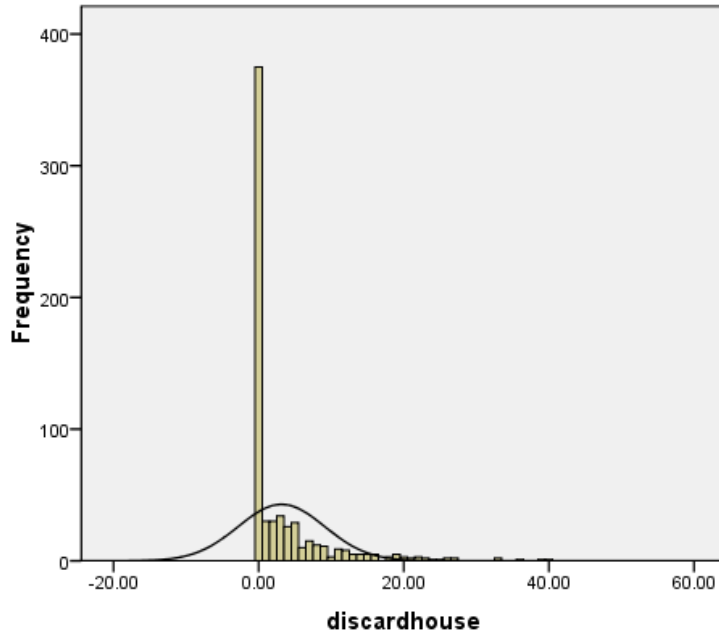
Mean =6.98  
Std. Dev. =0.722  
N =576

**discardinfo**



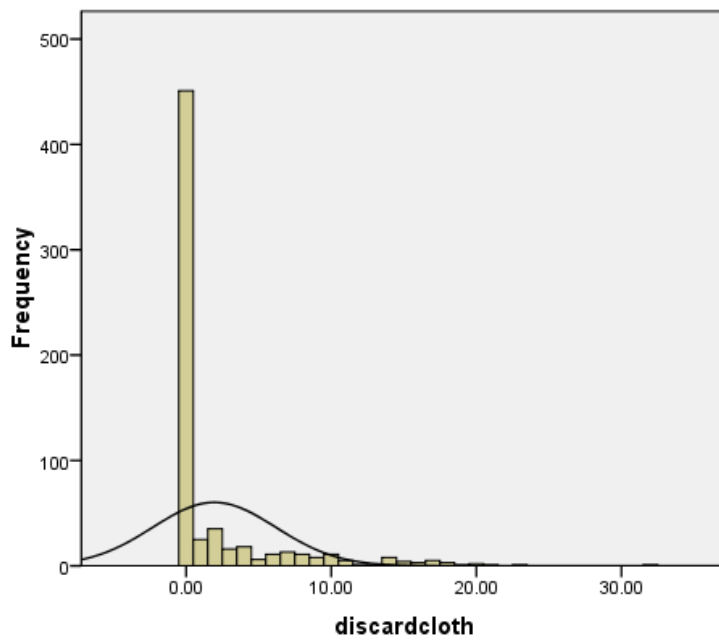
Mean =3.32  
Std. Dev. =15.525  
N =641

**discardhouse**



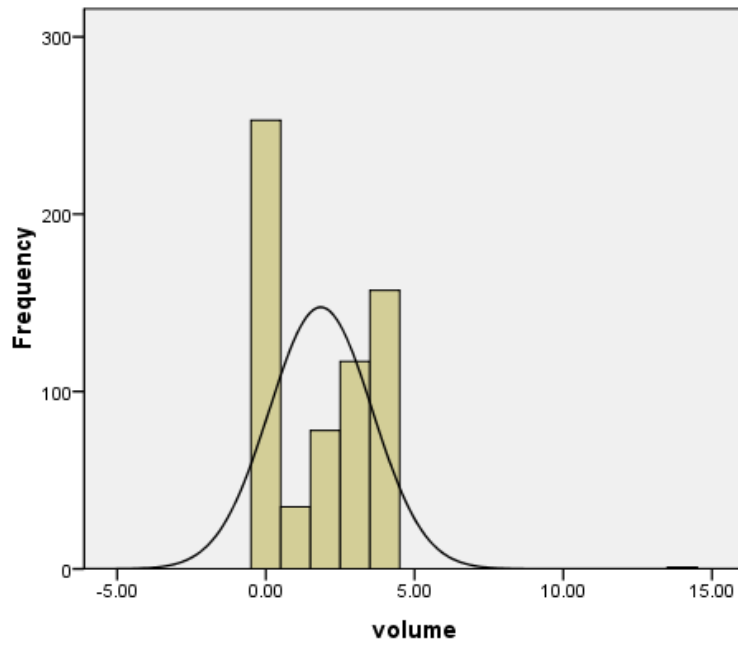
Mean =3.14  
Std. Dev. =5.964  
N=641

**discardcloth**



Mean =1.94  
Std. Dev. =4.246  
N=641

**volume**



## **APPENDIX F: PSYCHOMETRIC MEASURES**

**Brief Symptom Inventory (BSI; Derogatis, 1987)**

[REMOVED]

**Beck Depression Inventory (BDI-II; Beck, Steer & Brown, 1995)**

[REMOVED]

**Inventory of Interpersonal Problems-32 (IIP-32; Barkham, Hardy & Startup, 1996)**

[REMOVED]

**Compulsive Acquisition Scale (CAS; Frost, Kim, Morris, Bloss, Murray, Close & Steketee, 1998)**

[REMOVED]

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

[REMOVED]

**Clutter Image Rating (CI-R; Frost, Steketee, Tolin & Renaud, 2008)**

[REMOVED]

## APPENDIX G: RATER INSTRUCTIONS FOR CATEGORISATION AND DISCARD OF OBJECTS

### Rating task: Categorisation and volume of discarded objects

#### Introduction:

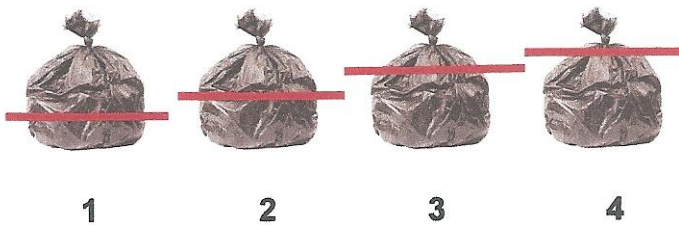
- ❖ The purpose of this rating task is to ‘test’ two systems for recording:
  - (a) The types of objects that the hoarder said they threw away each day
  - (b) The total ‘volume’ i.e. bulk or mass of all of the objects that the hoarder said they threw away each day
- ❖ You are being asked to try out these systems by rating some example lists of objects and feeding back your experiences
- ❖ There are no right or wrong answers! The researcher is simply looking to find out whether
  - the categorisation system is good enough to use, or if there are any problems with it so
  - it can be changed if necessary
- ❖ You will shortly be shown 10 lists of objects thrown away over 10 separate days that the hoarder was asked to record in a daily diary
- ❖ You will be asked to record:
  1. The category of individual objects thrown away each day
  2. The total ‘volume’ of all objects thrown away each day
- ❖ The three main categories for the objects are: **(full list overleaf)**
  - information based objects
  - household waste objects
  - clothing footwear and linen objects
- ❖ However there may be items which fall into none of the three main categories. The researcher is interested in finding out which objects are difficult to categorise or which do not seem to fit into the three main categories. These should be listed in the ‘other’ category. There will also be a space for you list those items.
- ❖ You will then be asked to use the visual rating scale **(overleaf)** to estimate how much of a typically sized bin bag you think the **total items** listed would fill. This is on a scale from 1-4. The maximum rating is 4.
- ❖ We will rate the lists separately first and then come back as a group and discuss our findings.
- ❖ Thank you again for taking part in this study.

## Rating Tools

### Object Categories:

1. Information based objects	2. Household waste objects	3. Clothing, footwear and linen objects	4. Other
<b>E.g.</b> Newspapers Magazines Leaflets Books Utility bills Photographs Computers Junk mail Cards Electronics Mobile phones CD's TV VCR's	<b>E.g.</b> Food Carpets Packaging Curtains Cartons Rugs Cleaning products Ornaments Cloths Crockery Bottles Toys and games Tins Furniture (small or bulky)	<b>E.g.</b> Shirts Pillowcases Jumpers Quilts Coats Quilt covers Jackets Bags Shoes/boots Trousers Bedsheets Skirts Towels Pillows	<b>E.g.</b> Any items that do not fit into categories 1, 2 or 3

### Total 'volume' of all objects thrown away:





**Rating instructions:**

1. First look at all the individual items listed
2. Then decide upon a category for each item (e.g. Information, Household, Clothing)
3. If you do not feel the item fits into either of the three main categories, put it in **'Other'**
3. Make a decision about how many item(s) it represents
  - If it is a single item e.g. *'magazine'* = 1 item
  - If it is multiple copies of the same item e.g. *'5 magazines'* = 5 items
  - If it is a 'pair' and item is **inseparable**, e.g. *'sunglasses'*, *'trousers'* = 1 item
  - If it is a 'pair' and item is **separable**, e.g. *'curtains'*, *'shoes'* = 2 items
4. If it is unclear how many items it represents (e.g. *'books'*) but it is clearly more than one item, you should give that item = **'2' items**
5. Write down your number in the **'total number in list'** box next to the category you have chosen for that item. You may find it easier to keep a running tally.
6. Finally, make a decision around how much volume the **TOTAL** number of items in the list represents using the bin bag rating scale. How much of a typical sized bin bag do you think the items would fill?  
This is up to a **maximum rating of 4.**

**Rating example:**

**List:**

<i>2 pairs of shoes</i>	<i>3 bottles</i>
<i>5 magazines</i>	<i>1 Belt</i>
<i>Paint tins</i>	<i>2 Trousers</i>
<i>Vase</i>	
<i>Containers</i>	

<b>Objects listed</b>	<b>Total number in list</b>
Information based objects	IIIII (5)
Household waste objects	IIIII III (8)
Clothing, footwear and linen objects	IIIII II (7)
Other	0

**Information based objects:**

5 magazines (5)  
**Total = 5**

**Clothing, footwear and linen objects:**

2 pairs of shoes (4)  
 1 belt (1)  
 2 trousers (2)  
**Total = 7**





**Household waste objects:**

Paint tins (2)  
 Vase (1)  
 Containers (2)  
 3 bottles (3)  
**Total = 8**

**Other:**

**Total = 0**

**Total 'volume' of all objects thrown away:**

			
<b>1</b>	<b>2</b>	<b>3</b>	<b>4 ✓</b>

## Rating Task

### List 1:

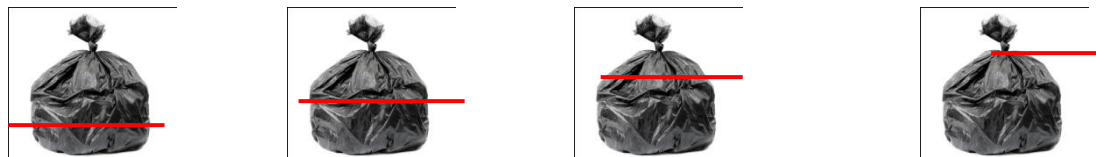
*Cups*  
*Plates*  
*Sieve*  
*6 books*

<b>Objects listed</b>	<b>Total number in list</b>
Information based objects	
Household waste objects	
Clothing, footwear and linen objects	
Other	

Items listed in 'other' category:

-----  
-----  
-----  
-----

**Total 'volume' of all objects thrown away:**



1

2

3

4

**List 2:**

*Candle holder*  
*2 jumpers*  
*1 dress*  
*2 jumpers*  
*8 braziers*  
*3 underskirts*  
*1 belt*  
*Small table*

<b>Objects listed</b>	<b>Total number in list</b>
Information based objects	
Household waste objects	
Clothing, footwear and linen objects	
Other	

Items listed in 'other' category:

-----  
-----  
-----  
-----

**Total 'volume' of all objects thrown away:**



1

2

3

4

## APPENDIX H: VIDEO RATING TASK INSTRUCTIONS

### Video rating task

- ❖ You will shortly be shown 4 short videos. Your task is to watch the videos as they are presented to you by the researcher and make a judgement about the overall level of 'clutter' shown in that video from '1' (not at all cluttered) up to a maximum of '9' (extremely cluttered).
- ❖ You will be given a rating scale with colour photos to help you with your decision making before watching the videos.
- ❖ Each of the photos in the rating scale has a number (i.e. from 1-9). You should choose the photo number that you think **best represents the level of clutter shown in the video.**
- ❖ There are no right or wrong answers and this is not a test. Please do not discuss your responses with other raters.
- ❖ Thank you again for taking part in this study.

**Video 1:**

Please tick your rating

1	2	3	4	5	6	7	8	9

**Video 2:**

Please tick your rating

1	2	3	4	5	6	7	8	9

**Video 3:**

Please tick your rating

1	2	3	4	5	6	7	8	9

**Video 4:**

Please tick your rating

1	2	3	4	5	6	7	8	9

**Video 5:**

Please tick your rating

1	2	3	4	5	6	7	8	9

**Video 6:**

Please tick your rating

1	2	3	4	5	6	7	8	9