**Abstract**

This paper sought to assess whether cognitive analytic therapy (CAT) was effective with a male patient meeting diagnostic criteria for hoarding disorder (HD). An adjudicated hermeneutic single case efficacy design (HSCED) evaluation was undertaken. A rich case record (i.e. a summary document containing the case details, formulations and detailed qualitative/quantitative outcomes) was created. This rich case record was then debated by affirmative (*N*=3) and sceptic (*N*=3) research teams. Expert judges (*N*=3) reviewed the debate and then delivered a final verdict as to whether CAT had been efficacious. Judges unanimously returned a verdict in favour of the sceptic position, concluding that CAT had not been efficacious. Lack of change on the primary nomothetic hoarding outcome measure was particularly influential in the final judgement. More research is needed before any definitive conclusions can be drawn as to the wider utility of CAT with HD. Methodological limitations are outlined, alongside considerations for any future research.

**Practitioner Points**

* For those patients that have been unresponsive to CBT, then other psychotherapeutic modalities should be considered.
* Psychotherapies need to be focused on enabling and then maintaining discard efforts.
* CAT appears able of formulating when the manner in which the patient relates to their possessions mirrors their past relationships.

The identification, classification and general nosology of hoarding was formalised by the inclusion in DSM-5 of the diagnosis of Hoarding Disorder (APA, 2013). The most commonly used treatment framework is the cognitive behavioural model (Frost & Hartl, 1996). Cognitive behaviour therapy (CBT) is the most common intervention for HD and in terms of evidence of effectiveness, Williams and Viscusi’s (2016) systematic review (n=12 studies across modalities, populations and providers) found matched improvements across purely behavioural versus bespoke CBT interventions. A meta-analysis (Tolin, Frost, Steketee & Muroff, 2015) of these CBT outcome studies (n=10 studies) found significant decreases in hoarding symptom severity, with a larger effect size regarding reduced discard in comparison to acquisition. However, dropout rates were high and hoarding problems persisted for greater than half of all treatment completers.

The possible reasons for the variable acceptability and effectiveness of CBT include fluctuating levels of patient motivation and the ego-syntonic nature of hoarding (Muroff et al., 2009; Timpano & Schmidt, 2013), fluctuating insight and motivation to change (Worden, DiLoreto & Tolin, 2014), resistance to discard (Steketee et al., 2000; 2010), poor compliance with between-session tasks (Tolin et al., 2007) and the high co-occurring rates of other mental health conditions (Frost, Steketee & Tolin, 2011). Systematic reviews of HD treatment outcomes have therefore consistently called for well conducted HD outcome research that test treatment models other than CBT (e.g. Williams & Viscusi, 2016; Thompson et al. 2017). Tolin et al. (2015) particularly called for more knowledge to be generated concerning what can help patients prone to hoarding that have been previously unresponsive to CBT.

Cognitive analytic therapy (CAT) is a collaborative, relational and time-limited psychotherapy (Ryle, Kellett, Hepple & Calvert, 2014), whose theory and associated methods are well articulated (Ryle & Kellett, 2018). As CAT has not been used as a treatment model with HD previously, the theoretical and clinical relevance of CAT in relation to the treatment of HD will now considered. Theoretically, CAT integrates personal construct and object relations (i.e. psychodynamic) theory (Ryle, 1985), to assert that mental representations of the self and others are founded in (and then maintained) by developmental early interactions (Ryle & Kerr, 2002). CAT theory rests on three theoretical foundation stones; *reciprocal roles, target problem procedures* and the *multiple self-states model* (MSSM) and each of these have relevance in an HD context. Internalized early object relations (termed ‘*reciprocal roles’)* would influence the manner in which an HD patient relates to possessions and objects across the lifespan. Reciprocal roles can be self-to-self (i.e. the relationship the hoarder has with them self), self-to-other (i.e. how the hoarder relates to people, objects and possessions) and other-to-self (i.e. what hoarding behaviour elicits from others). CATwould conceptualize hoarding as a consequence of childhood neglect, abandonment and abuse, leading to the internalization and then acting out of pathological reciprocal roles with objects, possessions and people. Samuels et al., (2008) has illustrated that specific childhood adversities were associated with hoarding. In CAT, *target problem procedures* (*TPPs;* Ryle & Kerr, 2002)are labelled as traps (i.e. a vicious circle of anxious avoidance regarding discarding possessions), snags (i.e. self-sabotage of the home environment and getting enmeshed with possessions) and dilemmas (i.e. false either/or dilemmas, such as keep everything or throw everything away).

In CAT, narrative and sequential diagrammatic reformulation would be collaboratively produced to enable the HD patient to better recognise the historical antecedents of roles currently enacted with objects, possessions and people, and also how procedures link the roles together in the here and now, to maintain current hoarding (Ryle & Kellett, 2018). CAT’s multiple self-states model (MSSM; Ryle 1997) would account for the identity disturbance and rapid switching between extreme states that frequently presents across complex cases (Pollock et al. 2001). The MSSM emphasises how childhood trauma would create distinct and marked separation between varieties of dysfunctional key states for the hoarding patient, that are then maintained through ongoing dissociation (Ryle, 2007).

The three key theoretical aspects of CAT therefore offer potential in conceptualizing the state-shifting (e.g. the reverie of object purchase, to the fear encountered when attempting to discard, to the rage when objects are touched, moved or discarded without permission), reciprocity (e.g. occupying both the abandoning and abandoned poles of reciprocal roles) and procedural elements (e.g. hoarding having interpersonal consequences, such as eliciting rejection and abandonment from family and neighbours) of HD. The analytic nature of CAT also affords the opportunity to analyse ‘role enactments’ in the therapeutic relationship (Ryle & Kellett, 2018), that mirror the relationship the hoarder has with their possessions, and in their key relationships. Clinically, CAT uses a three-phase approach to change; (1) a *reformulation* stage during which the patient’s hoarding would be reformulated via narrative and sequential diagrammatic reformulations, (2) a *recognition* stage to enable the patient to better recognise when they are caught in hoarding roles and procedures and (3) the final stage of *revision* in which the patient and therapist would work collaboratively to explore how to enable discarding and decluttering through changing roles and procedures. Any change method used during the revision stage (or ‘*exit*’ in the language of CAT), should always be grounded in the sequential diagrammatic reformulation (Ryle & Kellett, 2018). This ensures that exits are theoretically grounded, patient-centred and also finely balance support/challenge, through identifying and working within the patient’s individual capacity for self-development, known as the zone of proximal development (ZPD; Vygotsky, 1978).

Hermeneutic single case efficacy design (HSCED) was developed as an outcome methodology in order to provide a rigorous system for discerning therapeutic efficacy at an N=1 level (Elliott, 2002). HSCED uses a mixture of quantitative and qualitative methods to create a network of process and outcome evidence (i.e. a ‘rich case record’) that aims to reveal direct demonstrations of causal links between therapy process and outcome, and then additionally considers and evaluates plausible non-therapy explanations for the apparent changes observed. The ‘rich case record’ relies on collecting a greater breadth of evidence than a traditional single case experimental design (SCED). A ‘rich case record' is created through précising the results from repeated and intense measurement of ideographic symptom measures, nomothetic outcome measures, summarising case notes, reporting changes in measures of the alliance/session impact over time and also using transcripts from patient interviews (Barker et al., 2002).

There has been an increase in HSCED use with published examples across a variety of treatment modalities (e.g. Elliott et al., 2009; MacLeod, Elliott, & Rodgers, 2012; Stephen, Elliott, & MacLeod, 2011; Widdowson, 2012; Curling et al. 2018). The HSCED method has also been extended via the addition of an *adjudication element* mimicking the legal process (Elliott et al., 2009) that’s adds to the interval validity of the study. In an adjudicated HSCED, expert judges observe the debate of the ‘rich case record’ between sceptic and affirmative research teams, to arrive a final decision as to therapeutic efficacy that is *beyond reasonable doubt* (Elliott et al., 2009). The key advantages of the adjudicated HSCED method over the traditional SCED method is that (a) it enables conclusions to be drawn regarding treatment efficacy by making process-outcome links, (b) is a much more internally valid approach to evaluating efficacy in single cases, (c) uses information drawn from a wider variety of sources and (d) reduces the possible impact of researcher allegiance bias. Adjudicated HSCED therefore meets established standards for systematic case study research (Benelli, De Carlo, Biffi, & McLeod, 2015). The method is particularly strongly suited to evaluating novel treatment approaches, where the evidence base is thin and in examples of the treatment of relatively rare diagnoses (Elliott et al., 2009).

Therefore, this study explored the efficacy of cognitive analytic therapy (CAT) using an adjudicated HSCED design, in a patient with HD that had been previously additionally non-responsive to CBT. CAT was deemed an appropriate and safe alternative treatment model, because (a) the model has been shown to be effective across a range of complex psychological disorders (Ryle, Kellett, Hepple & Calvert, 2014), (b) the relational nature of CAT formulation and treatment offered the opportunity for the patient to understand and then change their relationship they had with self, others and their possessions (Grisham, Martyn, Kerin, Baldwin & Norberg, 2018), (c) it would have been unethical to offer another attempt at CBT, when this had proved previously ineffective (see method) and (d) CAT acknowledges and formulates the impact of prior trauma which is common in HD ([Cromer,](https://www.sciencedirect.com/science/article/pii/S0005796707001179#!) Schmidt & Murphy, 2007). This study is novel as there are no previous credible empirical evaluations of an integrative psychotherapy for HD and no previous adjudicated hermeneutic single case experimental designs have been completed with an HD case.

**Method**

**Design**

Ethical approval for study was achieved (15/NW/0199) for an A/B (i.e. phase change without reversal; Shadish & Sullivan, 2011) with follow-up SCED with hermeneutic adjudication. Ideographic outcomes were categorised into three phases; baseline (A), treatment (B) and follow-up (F/U). Baseline (A) consisted of three assessment sessions over a 4-week period (baseline ‘A’ phase; 27 days); baseline phase sessions did not contain any active change methods. Treatment consisted of twenty-seven sessions delivered over a 39-week period (treatment ‘B’ phase; 273 days). Treatment (‘B’) was initiated by the delivery of the narrative reformulation letter at session 4 as is consistent with previous single case evaluations of CAT (e.g. Curling et al. 2018). Follow-up consisted of six-sessions spanning a total of six-months (follow-up phase =175 days). The three phases therefore spanned a total of 475 days.

**Participant**

The client was a 64-year-old male with significant chronic hoarding problems. At a screening session, he was assessed with the Structured Interview for Hoarding Disorder (Nordsletten et al., 2013) and met the DSM-5 (APA, 2013) diagnostic criteria for HD. His problems with hoarding commenced following the sudden breakdown of a relationship when aged 35 years. The client stated that the end of the relationship signalled a ’breakdown’ and that he had struggled emotionally for 2-3 years following the end of the relationship. The hoarding started with the house becoming messy and disorganised at first due to low mood and apathy, and then developing into severe hoarding over time as the client started to develop stronger attachments to objects and also to start to experience anxiety at the point of discard. At the time of the CAT, the client was living with a new partner.

The client owned his own home, which was so severely cluttered that none of the rooms functioned as intended. The clutter was piled to head-height in each room and there was no way of navigating through the rooms, other than to clamber over the clutter. The rooms barely functioned as intended. The home was physically neglected and in poor repair, as any necessary work was difficult to achieve due to clutter and also the shame of allowing workmen access to the house. Possessions were also stored at his partner’s house, on an allotment (i.e. small gardening space away from the home for growing vegetables) and in his car. The client described chronic behavioural avoidance of discarding of possessions and compulsive acquisition of free items (e.g. 'skip surfing'). The client stated that he could rarely resist acquiring any free item, if he saw the opportunity to acquire it. For example, he would collect many free samples of shampoo, with the intention of decanting all the sachets into a large bottle, not do this and then be left with huge collections of sachets and other half empty bottles. He stated that he would ‘really feel’ for any discarded item, would acquire that item, intend to clean or mend it, but never then get round to doing that. The client felt ashamed of the state of the property and typically did not allow anyone access.

The client reported cognitions consistent with saving behaviour (e.g. thoughts relating to the utility and sentimentality of possessions). He exhibited poor impulse control (e.g. past substance misuse and binge eating), including that of compulsive buying and met diagnostic criteria for kleptomania (APA, 2013). In terms of the kleptomania, the participant described the typical increasing anxiety leading up to stealing and an intense feeling of gratification/success and narcissistic pride on completion. The client was aware of the immorality of his behaviour, but did not feel markedly guilty after thieving instances and was not particularly fearful of the consequences of being found out. The client described chronic and continuous episodes of stealing with only minor fluctuations in frequency (APA, 2013).

The client was co-morbidly depressed and stated that he had been depressed for many years. In the previous two weeks the client reported significantly depressed mood, lack of pleasure, ongoing fatigue, poor concentration and passive suicidal ideation. The client reported early childhood experiences of emotionally distant parents and chronic ineffectual boundary management. He reported learning from an early age how to manipulate others and developed a sense of entitlement, importance and superiority. He identified a vivid fantasy world in which he felt happy and powerful, and one in which did not have to entertain a normal life (e.g. such as routinely discarding of possessions). The client described himself in relationships as distant and manipulative and that he tended to feel that he was better than friends, peers and his partner.

In terms of previous interventions, the client had engaged in CBT on two occasions (20 and 6 sessions) with British Association of Behavioural and Cognitive Psychotherapy (BABCP) accredited CBT therapists. Both treatments focused on implementing basic exposure and response prevention strategies, and so were not based on the Steketee & Frost (2013) HD treatment manual. Both CBT treatments were clinically ineffective. On both occasions, the client did not engage in any discard activities and continued to acquire. The client dropped out of the 6 session intervention and was discharged from the 20 session intervention, due to lack of any progress. The client had previously been prescribed a variety of psychiatric medications, but did not take any medication during any phases of the current study.

**Treatment**

Treatment was delivered in the UK in a tertiary outpatient psychotherapy service provided by the National Health Service following a referral from a General Practitioner. The client was referred for CAT following an initial assessment which concluded that he was not suitable for psychoanalysis in the psychotherapy service. He attended one screening session and was allocated to a 24 session plus six-months follow-up treatment contract. CAT treatment duration is either 8, 16 or 24 weekly sessions in routine practice (Ryle & Kellett, 2018). In this study, therapy was extended by three sessions to twenty-seven sessions due to the participants struggle with the termination of therapy and this was a procedural change that occurred during the course of the study. The client’s struggle with termination was predicted in the narrative reformulation (and was a feature of the sequential diagrammatic reformulation) and was related to the sudden end of a previous relationship that had triggered the problems with hoarding originally.

The therapist was a male Consultant Clinical Psychologist and CAT psychotherapist and had weekly supervision provided by a UKCP CAT psychotherapist. In terms of treatment fidelity, then the hallmark components of CAT therapy (Ryle & Kerr, 2003) are a narrative reformulation, a sequential diagrammatic reformulation and goodbye letters exchanged at the termination of therapy by client and therapist. In the current case, all these features were present. Each component was reviewed at clinical supervision to ensure fidelity to CAT’s theoretical model. CAT is not a manualised therapy and therefore a treatment manual was not used. The therapist did have previous experience of treating hoarding with CBT (Pollock, Kellett & Totterdell, 2013).

In this case the formulation was underpinned by CAT’s multiple self-states model (Pollock, Clarke, Dorrian & Ryle, 2001) describing the following key states; fantasy (sense of omnipotence), abandoned (with the reciprocal role of abandoning-abandoned), admired (with the reciprocal role of admiring-admired) and criticised (with the reciprocal role of criticising-humiliated). ‘Goodbye letters’ are exchanged at final CAT sessions by both client and therapist and this was the case here. One single entire 50-minute audio-recorded treatment session (session 13) was rated by a CAT therapist on the Competence in Cognitive Analytic Therapy measure (Bennett & Parry, 2004); the CCAT contains 77 elements of therapist competence across 10 domains of therapeutic practice. The CCAT score was 32/40, with 20 being the cut-off for competent CAT (Bennett & Parry, 2004).

**Idiographic measures; content and timing**

At completion of session one, a daily diary of ideographic measures was agreed and designed that contained items concerning acquisition, stealing, discarding, fantasy proneness and anxiety. These items reflected the main concerns of the participant. The diary was completed on a daily basis throughout the baseline, treatment and follow-up phases. Fantasy proneness was measured by the item *‘how hard have I worked on my real problems today?’* rated 1 not at all to 9 all day. Anxiety was rated in the morning, afternoon and evening on the same Likert scale of 1 (not at all) to 9 very). Daily acquisition and discarding data (free text in the diary) was used to generate further variables of interest, via the four steps used by Pollock et al. (2013): (step 1) a frequency count of objects acquired each day; (step 2) assignment of objects acquired each day to one of three categories of either bought, stolen or free (e.g. obtained from skips); (step 3) assignment of objects acquired each day to one of four categories: garden/allotment (e.g. plants), household (e.g. shampoo bottle), information based (e.g. books) and clothes; (step 4 ) estimated volume of objects acquired each day (irrespective of category); four volume estimates (25% [0.25], 50% [0.50], 75% [0.75] and 100% [1.0] of a 60 gallon rubbish bag) were used. Estimates over this level were obtained by calculating the combined number of bags (e.g. 2.5 bags). Steps 1, 3 and 4 were repeated for objects discarded each day. Three independent raters (trainee clinical psychologists) were trained in rating and then provided with 80 days of treatment phase data (40 acquisition and 40 discard) and completed each stage outlined above. Forty days of data (20 acquisition and 20 discard) was selected randomly with the remainder purposely selected on the basis that they were difficult to count/categorise. Inter-rater reliability was high for the majority of variables (α≥ .80 [*n*=3]; α ≥ .9 [*n*=11]). Frequency count of garden/allotment objects discarded was poor (α=.40). Raters were blind to the intervention and the outcome.

**Nomothetic measures of process and outcome**

Four self-report validated, standardised psychometric outcome measures (one specific to HD) and one observer-rated HD outcome measure were used at three time points; assessment, end of treatment and end of follow-up. The HD measures (SI-R and CIR see below) indexed the effectiveness of CAT on the presenting problem, with the other measures (BDI and BSI see below) measuring effectiveness in wider domains. A process measure of session impact was also taken after each session. *Beck Depression Inventory-II* (BDI-II; Beck, Steer, & Brown, 1996). The BDI-II is a 21 item measure of depression. Higher scores reflect greater severity with defined cut-offs operationalising minimal (<13), mild (14–19), moderate (20–28) and severe (>29) levels of depression. *Brief Symptom Inventory (BSI;* Derogatis, 1993*).* The BSI is a 53 item measure of psychological distress. The BSI provides nine symptom dimensions and three global distress scales. *Savings Inventory–Revised (SI-R).*The SI-R measures hoarding and consists of 23 items assessing three main features; difficulty discarding, acquiring and clutter (Frost, Steketee, & Grisham, 2004). A total score greater than 41 indicates clinical levels of hoarding (Frost & Hristova, 2011). *Clutter Image Rating (CIR) Scale.*The CIR was used as the observer measure and is a means of assessing levels of clutter in the home. Three rooms are rated against standardised pictures (kitchen, living room and bedroom) with a clinical cut-off score of four or more (Frost, Steketee, Tolin, & Renauld, 2008) for each room. Three independent raters (trainee clinical psychologists) provided an overall clutter rating for each room based on photographs (*nbaseline=12; nfollow-up=12)*) of the participant’s home. Photographs were not available for end of treatment. Raters remained blind to study phase, with order of presentation (study phase and room) randomly adjusted for each rater. Mean scores for each room are reported. *Session Impact Scale* (SIS; Elliott & Wexler, 1994).The SIS is a self-report measure that assesses helpful and hindering aspects of therapy sessions. Seventeen items are scored on a five-point scale (1-5), with the helpful scale breaking down into two subscales (relationship and task).

**Qualitative interviewing: The Change Interview.**

The Change interview (CI) is a semi-structured interview assessing the client’s perspective as to any changes that have occurred (or not) during therapy and explores identified contributory factors. Changes are rated with regards to expectancy, likelihood and importance (Network for Research on Experiential Psychotherapies, 2003). The CI was conducted at the end of treatment and end of follow-up by an independent third party (i.e. a clinical psychologist that was separate to the research and blind to intervention and outcome).

**Analysis strategy**

Idiographic outcomes of acquisition, stealing, discard, fantasy proneness and anxiety are depicted by phase in graphical form with baseline median and phase trend lines enabling visual inspection. Treatment effects were assessed using an analysis of covariance (ANCOVA). All acquisition and discard variables were not normally distributed showing a positive skew. Although a square-root transformation reduced the level of skew, distributions continued to deviate from normality. ANCOVA however is robust regarding violations of the normality assumption (Glass, Peckham, & Sanders, 1972). Serial dependency and non-independence in the time series was overcome by creating a lagged variable according to phase of treatment for each ideographic measure (Chatfield, 2003). Partial autocorrelations (PACF) indicated that a first-order lag was appropriate for each ideographic measure in each phase and autocorrelation of residuals confirmed that this decision was appropriate. The lagged variable was then entered as a covariate into each ANCOVA. Planned contrasts compared the phases of the study. To control for multiple comparisons, significant effects were reported at a reduced *p* value ≤.01. The magnitude of effect sizes was assessed using the non-regressive method percentage exceeding the median (PEM; Parker, Vannest, & Davis, 2011). A logistic regression explored whether study phase predicted incidence of discard (did/did not discard). Daily discard occurrence was dichotomized to create the dependent variable. Independent-samples t-tests compared assessment versus treatment sessions on the SIS. The BDI, BSI, SI-R and CIR were all analysed to assess whether reliable and clinical change had occurred. Reliable change indicates when change is not attributable to chance/measurement error (Jacobson & Truax, 1991) and clinically significant change indicates when a patient no longer scores within the clinical range (Evans, Margison & Barkham, 1998). See footnote of table two for the references for each measure for these analyses.

**Procedure**

The adjudicated HSCED consisted of the following phases (Elliott et al., 2009):

*Phase 1: case record development.*The qualitative and quantitative outcome data was summarised, analysed and combined to the form a network of evidence a presented as a rich case record. This consisted of an eight-page document of graphs, tables, quotes drawn from the patient interviews, all organised to reflect the phases of the study. The rich case record was supplemented by the narrative reformulation, sequential diagrammatic reformulation and goodbye letter from the therapist and from the client. This rich case record was presented to the affirmative and sceptic research teams. The case record was checked to ensure that it presented the network of evidence in a balanced manner. *Phase 2: briefs and rebuttals.* Six trainee clinical psychologists were randomly allocated to either the affirmative (AT, *n*=3) or sceptic research teams (ST, *n*=3). Research team members had to meet the following criteria: (a) in the third year of clinical training; (b) successful completion of one previous SCED study; (c) skills in critically evaluating outcomes and (d) knowledge of a variety of therapeutic models. Each team met on two occasions. In the first meeting each team reviewed the rich case record and developed their brief (i.e. their summary opinion). The brief was a two-page summary directly linking to the evidence in the rich case record. At the second meeting, each team reviewed the opposing team’s brief, provided a written counterargument and produced a written closing summary statement. *Phase 3: adjudication.* Three independent researchers acted as judges, experienced in evaluating psychotherapy outcome research and representing two therapeutic models (CAT and CBT). Two of the judges were HD experts. Judges were provided with the original case record (order of presentation of the original outcome data was randomised for each judge from the rich case record), summary opinions of the two research teams, the team’s counter arguments, and the final summary statements from each team.

**Results**

*Ideographic and nomothetic outcomes*

Figure 1 is a graph of the rate of discarding of possessions over the phases of the study and Table 1 contains the means (SDs) for all ideographic measures by phase of study. Stage of treatment was not a significant predictor of discarding behaviour (*χ²* (2, 475) = 3.355, *p* =.19). A significant main effect of study phase was found for four variables: fantasy proneness (*F*(2, 369) = 8.55, *p* <.01), objects bought (*F*(2, 381) = 8.41, *p* <.01), informational objects acquired (*F*(2, 381) = 9.73, *p* <.01) and morning anxiety (*F*(2, 378) = 4.45, *p* =.01). Planned contrasts revealed a significant reduction between treatment and follow-up for objects bought (*t*(381) = 4.09, *p* < .01), informational objects acquired (*t*(381) = 4.41, *p* <.01) and morning anxiety levels (*t*(378) = 2.96, *p* <.01), with associated small effect sizes (partial eta²) .04, .05, and .02 respectively. A significant increase between treatment and follow-up was found for fantasy proneness (*t*(369) = 3.98, *p* <.01), with a small effect size (partial eta² = .04). The PEM analysis confirmed small treatment effects; fantasy proneness =.7; objects bought =.6, informational objects acquired =.6 and morning anxiety =.6.

Table 2 summarises nomothetic outcomes. Scores on the hoarding measures (SI-R and CIR) show little change, with scores above caseness at assessment and remaining above at end of treatment and at follow-up. The BDI-II score reduced over time, with reliable and clinically significant reduction in depression achieved by the end of follow-up (final BDI score was within the ‘mild’ range and below caseness). The BSI-GSI showed a reliable reduction from baseline to end of treatment and this change was sustained at the end of follow-up. In terms of the impact of sessions, there was a significant increase in the task focus (t (25)=2.89, p = 0.001) during treatment sessions (M=18.58, SD=2.70) compared to baseline sessions (M=11.00, SD=6.08). There was no change in hindering aspects of sessions (t(25)=1.27, p=0.21) in baseline (M=14.00, SD=1.27) versus treatment (M=11.21, SD=3.60) comparisons and similarly no change in the relationship (t(25)=1.51, p=0.14) between baseline (M=15.00 SD=6.93) and treatment (M=19.50, SD=4.63) sessions.

The Change Interview results are summarised in Table 3. The participant gave a positive account of therapy and reported that CAT had been helpful in eight different ways. All changes were rated as extremely/very important. Six changes were rated as very unlikely to have occurred without therapy, with two rated somewhat unlikely. Changes were rated as both somewhat expected and a surprise. The client also however identified continued difficulties with acquisition and discarding of possessions, and some disappointment in the slow rate of progress. Difficult aspects of therapy included feeling exhausted following sessions, assimilating new self-knowledge, internalising and making use of insight and reduced support during the follow-up. No changes for the worse as a result of CAT were named by the participant. No adverse events as a result of therapy were noted.

*Research teams; briefs and rebuttals*

The primary arguments set forth in the affirmative and sceptic team briefs are summarised in Table 4. Elliott (2002) identified five affirmative types of evidence upon which the efficacy of a therapy can be established, with identification of at least two types of affirmative evidence stipulated as the threshold for analysis. The affirmative team identified four types of evidence within their original brief. Elliott (2002) identified eight types of sceptical evidence that would illustrate alternative explanations for change. The sceptic team identified six types of evidence within their original brief.

The rebuttals and closing summaries from the affirmative and sceptic teams were as follows:

*It is the affirmative team’s view that the client experienced substantial cognitive and emotional changes with the client showing evidence of early behavioural change. The affirmative team recognise the value of a positive therapeutic relationship and suggest that this is the primary mechanism for change within CAT. With this in mind it is the affirmative team’s opinion that the client did experience meaningful change and that the changes experienced by the client are directly attributable to the CAT.*

*It is the sceptic team’s view that the client did not experience meaningful change with little change observed in the client’s problems, particularly in hoarding and acquiring. The sceptic team suggest that the client valued the relationship with the therapist more than the therapy itself with the client’s account of therapy and the changes he reported an artefact of his desire to ‘please’ the therapist. With this in mind the sceptic team are of the opinion that any changes reported by the client cannot be attributable to the CAT.*

*Final adjudication*

Table 5 reports the judge’s ratings with regards to change. Final verdicts are required to meet a defined standard of ‘clear and convincing evidence’ which is set at a probability level of >80% (Stephen & Elliott, 2011). Median scores indicated the judgement that minimal therapeutic change had occurred, with change attributable to CAT only at a moderate level (< 20%). Judges were unanimous in terms of the lack of change in the hoarding specific nomothetic measures and also the lack of clear evidence of the impact of CAT specific tools. Judges unanimously agreed that the sceptic position gave the most convincing account of change: that meaningful change had not occurred in the HD due to the action of the CAT provided.

**Discussion**

The aim of this study was to intensively evaluate whether the cognitive analytic treatment of one male client meeting diagnostic criteria for HD was responsible for directly facilitating change in their hoarding. This is the first adjudicated HSCED of any psychological intervention for HD and the study was specifically conducted to meet calls for well-conducted evaluations of interventions other than CBT for HD. Following the development of a rich case record and associated affirmative and sceptic team debate, independent judges gave their final verdict as to the ineffectiveness of CAT. In considering their verdicts however, each judge recognised contradictions present in the rich case record (both within and between the qualitative and quantitative outcome data), with sometimes contrasting evidence regarding both the presence and absence of change. One advantage of adjudicated HSCED is that this method is particularly well suited to such a situation, where the process of developing affirmative and sceptic positions unearths (and then debates) previously unconsidered inconsistencies in the outcome data (Elliott et al., 2009). Reconciliation of these inconsistencies and also transparency in how this is achieved then confers greater confidence in the soundness of conclusions reached (Elliott et al., 2009). In making final verdicts, all judges identified that the primary goal of CAT was treatment of the HD, and so the evidence relating to the lack of change on the nomothetic hoarding measures (SI-R and CIRS) was particularly influential the decision-making process.

In terms of the possible reasons why the CAT was unsuccessful in treating the HD, then the following are of note; (a) all the sessions were delivered as out-patient psychotherapy and there is evidence that integrating domiciliary visits (Linkovski et al. 2018) or webcam support (Muroff & Steketee, 2018) in supporting discard and organisation efforts are clinically worthwhile, (b) the participant had been unresponsive to two previous courses of CBT and so could therefore be considered a treatment refractory case (Rosqvist, Thomas & Egan, 2002), and (c) the common attentional problems in HD also can compromise treatment delivery (Wheaton, 2016) and this was the case here, in terms of difficulty maintaining focus in sessions. The previous CBT interventions had failed because they did not manage to engage the client in any consistent exposure to discard activities, and this was also the case in the current attempt to deliver CAT. It could be argued that the previous CBT could have been effective if the therapists had delivered the Steketee & Frost (2003) treatment protocol specific to HD. The client could not translate analysis of reciprocal roles and associated procedures into the ‘exit’ of engaging in discarding of possessions, despite this being specified on the SDR. The fidelity checks of ensuring a narrative reformulation, SDR and goodbye letters were present in the case provides some reassurance that it was CAT (and not another therapy) that was delivered. Treatment delivery competency was checked via use of the CCAT on one of the sessions, but the limited nature of this check does not ascertain whether CAT was competently delivered across all the sessions. The assessment of treatment competency during SCED is a rarity (Tate et al. 2016) and so is a strength of the current study. The findings from this study also need to be interpreted in the context of the high level of client complexity and comorbidity. It is worth noting that all sessions were attended, suggesting the high acceptability of the CAT approach in this case.

The participant’s change process as summarised in the Change Interview results, illustrates that the patient had derived insight from the CAT, particularly in terms of his tendency to live in a fantasy world (one in which he was famous, powerful and attractive) and also his narcissistic tendencies (seeing himself as more important than others and others being less than him). However, despite the Change Interview suggesting the participant was more task-focused (mirrored by the significant increase on the task scale of the SES between baseline and treatment sessions) and less dissociated than previously, this did not translate into an ability to effectively and consistently engage in organising and discarding efforts. CBT for hoarding is very focused on changing the maintaining factors of hoarding and developing associated practical organising and discarding skills (Worden, Bowe & Tolin, 2017). The CAT applied here was clearly not as focal to hoarding as CBT for hoarding, but did facilitate broad insight and was experienced as helpful. Change in hoarding requires a consistent behavioural shift; there was not any strong insight-behaviour change sequence in this case. There is evidence of the effectiveness of contingency management in changing hoarding behaviour (Worden et al. 2017) and this may have helped to enable and then reinforce discard behaviour, once insight was established. It would be worth using the adjudicated HSCED method to attempt to evaluate the cognitive behavioural analysis system of psychotherapy with HD (CBASP; McCullough, 2000), as this intervention actively integrates relational and behavioural strategies.

The study had high external validity due to its practice-based approach, but also therefore had several limitations, the foremost of which is the *N*=1 nature and the associated sample size. A-B designs are only regarded as quasi-experimental (Barlow, Nock & Herson, 2009), with the adjudicated and hermeneutic nature of the study therefore enabling the consideration of efficacy. A true single case experimental design (e.g. such as the implementation of a withdrawal/reversal design) being twinned with an adjudicated and hermeneutic evaluation would create a study with very high internal validity (Tate et al. 2016), and also usefully better enable more detailed debate between sceptic and affirmative research teams. Taping of each session would have enabled a deeper qualitative exploration of the process of change and the impact of specific CAT methods in bringing about change (Elliot et al., 2009). A specific nomothetic outcome measure of kleptomania (e.g. Kleptomania Symptom Assessment Scale, KSAS; Grant, 2005) would also have been a useful addition to the methodology.

In conclusion, this adjudicated HSCED found CAT to be inefficacious in the treatment of a case of HD. Contributions of ineffective interventions are important and do make significant contributions to any evidence base due to preventing publication bias. It is worth noting that evidence relating to the efficacy of CAT in the treatment of one patient, is not sufficient to draw conclusions as to the efficacy of CAT for HD as a whole (Barker et al., 2002). Given the evidence of the role of disrupted interpersonal functioning in HD (Grisham et al. 2018), then a therapy that takes a relational and interpersonal approach to facilitating change would appear to have high acceptability. Finally, adjudicated HSCED does appear to be a valuable research methodology which is capable of evaluating change within specific therapy cases and from which new insights into mechanisms of change can be derived (Benelli et al., 2015).

**References**

American Psychiatric Association; APA. (2013). *Diagnostic and statistical Manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Barlow, D.H., Nock, M.K., & Herson, M. (2009). *Single case experimental designs. Strategies for studying behaviour change* (3rd edition). Boston, MA: Pearson.

Barker, C., Pistrang, N. & Elliott, R. (2002) *Research methods in clinical psychology*, (2nd Edition). Chichester, UK: John Wiley and Sons Ltd.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996*). Beck Depression Inventory-II Manual*. San Antonio, TX: The Psychological Corporation, Harcourt Brace.

Bennett, D., & Parry, G. (2004). A measure of psychotherapeutic competence derived from cognitive analytic therapy. *Psychotherapy Research, 14,* 176-192. doi:10.1093/ptr/kph016

Benelli, E., De Carlo, A., Biffi, D., & McLeod, J. (2015). Hermeneutic single case efficacy design: A systematic review of published research and current standards. TPM-Testing, Psychometrics, Methodology in Applied Psychology, 22, 97-133.

Bohart, A. C., Tallman, K. L., Byock, G., & Mackrill, T. (2011). The ‘research jury method’: The application of the jury trial model to evaluating the validity of descriptive and causal statements about psychotherapy process and outcome. *Pragmatic Case Studies in Psychotherapy, 7*, 101-144. doi:10.14713/pcsp.v7i1.1075

Chatfield, C. (2003). *The analysis of time series: An introduction* (6th ed.). Boca Raton, FL: Chapman & Hall.

[Cromer, K.A.,](https://www.sciencedirect.com/science/article/pii/S0005796707001179#!) Schmidt, N.B., & Murphy, D.L. (2007). Do traumatic events influence the clinical expression of compulsive hoarding? *Behaviour Research and Therapy, 45,* 2581-2592. [doi: org/10.1016/j.brat.2007.06.005](https://doi.org/10.1016/j.brat.2007.06.005)

[Curling L](https://www.ncbi.nlm.nih.gov/pubmed/?term=Curling%20L%5BAuthor%5D&cauthor=true&cauthor_uid=28990738)., [Kellett, S](https://www.ncbi.nlm.nih.gov/pubmed/?term=Kellett%20S%5BAuthor%5D&cauthor=true&cauthor_uid=28990738)., [Totterdell, P](https://www.ncbi.nlm.nih.gov/pubmed/?term=Totterdell%20P%5BAuthor%5D&cauthor=true&cauthor_uid=28990738)., [Parry, G](https://www.ncbi.nlm.nih.gov/pubmed/?term=Parry%20G%5BAuthor%5D&cauthor=true&cauthor_uid=28990738)., [Hardy, G](https://www.ncbi.nlm.nih.gov/pubmed/?term=Hardy%20G%5BAuthor%5D&cauthor=true&cauthor_uid=28990738)., & [Berry, K](https://www.ncbi.nlm.nih.gov/pubmed/?term=Berry%20K%5BAuthor%5D&cauthor=true&cauthor_uid=28990738). (2018). Treatment of obsessive morbid jealousy with cognitive analytic therapy: An adjudicated hermeneutic single-case efficacy design evaluation. *Psychology and Psychotherapy; Theory, Research and Practice, 91,* 95-116. doi: 10.1111/papt.12151

Derogatis, L. R. (1993). *BSI Brief Symptom Inventory: Administration, scoring, and procedure manual,* (4th ed.). Minneapolis, MN: National Computer Systems.

Elliott, R. (2002). Hermeneutic single-case efficacy design. *Psychotherapy Research, 12,* 1-21. doi:10.1080/713869614

Elliott, R., Partyka, R., Alperin, R., Dobrenski, R., Wagner, J., Messer, S. B., Watson, J. C., & Castonguay, L. G. (2009). An adjudicated hermeneutic single-case efficacy design study of experimental therapy for panic/phobia*. Psychotherapy Research, 19,* 543-557. doi:10.1080/10503300902905947

Elliott, R., & Wexler, M. M. (1994). Measuring the impact of sessions in process-experiential therapy of depression: The session impact scale. *Journal of Counselling Psychology, 41,* 166-174. doi:10.1037/0022-0167.41.2.166

Evan, C., Margison, F., & Barkham, M. (1998). The contribution of reliable and clinically significant change methods to evidence-based mental health. *Evidence-Based Mental Health, 1*, 70-72. doi:10.1136/ebmh.1.3.70

Frost, R. O., & Hartl, T. L. (1996). A cognitive-behavioral model of compulsive hoarding. *Behaviour Research and Therapy, 34*, 341-350. doi:0005-7967(95)00071-2

Frost, R. O., Steketee, G., & Grisham, J. (2004). Measurement of compulsive hoarding: Saving inventory-revised. *Behaviour Research and Therapy, 42,* 1163-1182. doi:10.1016/j.brat.2003.07.006

Frost, R. O., Steketee, G., & Tolin, D. F. (2011). Comorbidity in hoarding disorder. *Depression and Anxiety, 28,* 876-884. doi:10.1002/da.20861

Frost, R. O., Steketee, G., Tolin, D. F., & Renaud, S. (2008). Development and validation of the clutter image rating. *Journal of Psychopathology and Behavioural Assessment, 30*, 193-203. doi:10.1007/s10862-007-9068-7

Glass, G. V., Peckham, P.D., & Sanders, J. R. (1972). Consequences of failure to meet assumptions underlying the fixed effects analyses of variance and covariance. *Review of Educational Research, 42*, 237-288. doi:10.3102/00346543042003237

Grant, J.E. (2005). Outcome study of kleptomania patients treated with naltrexone: a chart review. C*linical Neuropharmacology, 28,* 11-14.

Grisham, J.R., Martyn, C., Kerin, F., Baldwin, P.A., & Norberg, M.M. (2018). Interpersonal functioning in Hoarding Disorder: An examination of attachment styles and emotion regulation in response to interpersonal stress. *Journal of Obsessive-Compulsive and Related Disorders, 16,* 43-49. doi: 10.1016/j.jocdrd.12.001

Jacobson, N. S., & Truax, P. (1991). Clinically significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consultant Clinical Psychology, 59*, 12-19. doi:10.1037//0022-006X.59.1.12

Linkovski, O., Zwerling, J., Cordell, E., Sonnenfeld, D., Willis, H., La Lima, C.N., Baker, C., Ghazzaoui, R., Girson, R., Sanchez, C., Wright, B., Alford, M., Varias, A., Filippou-Frye, M., Shen, H., Jo, B., Shuer, L., Frost, R., & Rodrigue, C.I. (2016). **Augmenting buried in treasures with in-home uncluttering practice: Pilot study in hoarding disorder. Journal of Psychiatric Research,** doi: [*10.1016/j.jpsychires.2018.10.001*](http://dx.doi.org/10.1016/j.jpsychires.2018.10.001)

McCullough, J. P. (2000). *Treatment for chronic depression: cognitive behavioral  
     analysis system of psychotherapy.* New York: Guilford Press.

Muroff, J., Steketee, G., Rasmussen, J., Gibson, A., Bratiotis, C., & Sorrentino, C. (2009). Group cognitive and behavioural treatment for compulsive hoarding: A preliminary trial. *Depression and Anxiety, 26*, 634-640. doi:10.1002/da.20591

Muroff, J., & Steketee, G. (2018). Pilot trial of cognitive and behavioural treatment of hoarding disorder delivered via webcam: Feasibility and preliminary outcomes. *Journal of Obsessive Compulsive and Related Disorders, 18,* 18-24. doi: 10.1016/j.jocrd.2018.05.002

Network for Research on Experiential Psychotherapies, (2003). *Change Interview*. Retrieved from

<http://www.experiential-researchers.org/instruments/elliott/hat.html>

[Nordsletten, A.E.](https://www.sciencedirect.com/science/article/pii/S2211364913000468#!) Fernández de la Cruz, L., Pertusa, A., [Reichenberg, A., Hatch, S.L. & Mataix-Cols, D.](https://www.sciencedirect.com/science/article/pii/S2211364913000468#!) (2013). The structured interview for Hoarding Disorder (SIHD): Development, usage and further validation. *Journal of Obsessive-Compulsive and Related Disorders, 2,* 346-350. doi: org/10.1016/j.jocrd.2013.06.03

Parker, R. I., Vannest, K. J., & Davis, J. L. (2011). Effect-size in single case research: A review of nine nonoverlap techniques. *Behavior Modification, 35*, 1-20. doi:10.1177/0145445511399147

Pollock, P., Broadbent, M., Clarke, S., Dorrian, A., & Ryle, A. (2001). The personality structure questionnaire (PSQ): A measure of the multiple self-states model of identity disturbance in cognitive analytic therapy. *Clinical Psychology and Psychotherapy, 8,* 59-72. doi: 10.1002/cpp.250

Pollock, L., Kellett, S., & Totterdell, P. (2013). An intensive time-series evaluation of the effectiveness of cognitive behaviour therapy for hoarding disorder: A 2-year prospective study. *Psychotherapy Research, 24*. 485-495. doi:10.1080/10503307.2013.843802

Rosqvist, J., Thomas, J.C. & Egan, D. (2002). Home-based cognitive-behavioural treatment of chronic, refractory obsessive-compulsive disorder can be effective; single case analysis of four patients. *Behavior Modification, 26,* 205-222. doi: [10.1177/0145445502026002005](https://doi.org/10.1177/0145445502026002005)

Ryle, A. (1985). Cognitive theory, object relations and the self. *British Journal of Medical Psychology, 58*, 1-7. doi: 10.1111/j.2044-8341.1985.tb02608.x

Ryle, A., Kellett, S., Hepple, J., & Calvert, R. (2014). Cognitive analytic therapy at 30. *Advances in Psychiatric Treatment, 20*, 258-268. doi:10.1192/apt.bp.113.011817

Ryle, A., & Kerr, I. B. (2002). *Introducing cognitive analytic therapy: Principles and practice*. West Sussex, England: John Wiley & Sons Ltd.

Ryle, A. (2007). Investigating the phenomenology of borderline personality disorder with the states description procedure: clinical implications. *Clinical Psychology and Psychotherapy, 14*, 329-341**.** doi: 10.1002/cpp.54

Ryle, A., & Kellett, S. (2018). Cognitive analytic therapy. In *Handbook of Personality Disorders: Theory, Research, and Treatment* (2nd Edition). Edited by [W. John Livesley](https://www.guilford.com/author/W-John-Livesley) and [Roseann Larstone](https://www.guilford.com/author/Roseann-Larstone). Guilford Press; NY.

Samuels, J. F., Bienvenu, O. J., Grados, M. A., Cullen, B., Riddle, M. A., Liang, K. Y., Eaton, W.W., & Nestadt, G. (2008). Prevalence and correlates of hoarding behavior in a community-based sample. *Behaviour Research and Therapy*, *46*, 836–844. doi:10.1016/j.brat.2008.04.004

Sandhu, S.K., Kellett, S., & Hardy, G. (2017). [The development of a change model of "exits" during cognitive analytic therapy for the treatment of depression](http://dx.doi.org/10.1002/cpp.2090). Clinical Psychology and Psychotherapy, *24*, 1263-1272.

Shadish, W.R. & Sullivan, K.J. (2011). Characteristics of single-case designs used to assess intervention effects. *Behaviour Research Methods, 43*, 971-980. doi: 10.3758/s13428-011-0111-y.

Steketee, G., Frost, R. O., Wincze, J., Greene, K. A. I., & Douglass, H. (2000). Group and individual treatment of compulsive hoarding: A pilot study. *Behavioural and Cognitive Psychotherapy, 28,* 259-268. doi:10.1017/S1352465800003064

Steketee, G., & Frost, R. O. (2007). *Compulsive hoarding and acquiring: Therapist guide.* New York, NY: Oxford University Press.

Steketee, G., Frost, R. O., Tolin, D. F., Rasmussen, J., & Brown, T. A. (2010). Waitlist-controlled trial of cognitive-behavior therapy for hoarding disorder. *Depression and Anxiety, 27,* 476-484. doi:10.1002/da.20673

Stephen, S., & Elliott, R. (2011). Developing the adjudicated case study method. *Pragmatic Case Studies in Psychotherapy, 7,* 230-241. doi: 10.14713/pcsp.v7i1.1079

Stephen, S., Elliott, R., & MacLeod, R. (2011). Person-centred therapy with a client experiencing social anxiety difficulties: A hermeneutic single case efficacy design. *Counselling and Psychotherapy Research, 11*, 55-66. doi:10.1080/14733145.2011.546203

Timpano, K. R., & Schmidt, N. B. (2013). The relationship between self-control deficits and hoarding: A multimethod investigation across three samples. *Journal of Abnormal Psychology, 122*, 13-25. doi:10.1037/a0029760

Timpano, K.R., Muroff, J., & Steketee, G. (2016). A review of the diagnosis and management of Hoarding Disorder. [*Current Treatment Options in Psychiatry*](https://www.infona.pl/resource/bwmeta1.element.springer-000000040501/tab/jContent)*,* [*3*](https://www.infona.pl/resource/bwmeta1.element.springer-000000040501/tab/jContent/facet?field=%5ejournalYear%5ejournalVolume&value=%5e_02016%5e_00003)[*4*](https://www.infona.pl/resource/bwmeta1.element.springer-000000040501/tab/jContent/facet?field=%5ejournalYear%5ejournalVolume%5ejournalNumber&value=%5e_02016%5e_00003%5e_00004), 394-410. doi: [10.1007/s40501-016-0098-1](http://dx.doi.org/10.1007%2Fs40501-016-0098-1)

Tolin, D. F., Frost, R. O., & Steketee, G. (2007). An open trial of cognitive-behavioral therapy for compulsive hoarding. *Behaviour Research and therapy, 45,* 1461-1470. doi:10.1016/j.brat.2007.01.001

Tolin, D. F., Frost, R. O., Steketee, G., & Muroff, J. (2015). Cognitive behavioral therapy for hoarding disorder: A meta-analysis. *Depression and Anxiety, 32,* 158-166. doi:10.1002/da.22327

Vygotsky, L. S. (1978). *Mind in society: the development of higher psychological processes.* Cambridge, Mass.: Harvard University Press.

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

Widdowson, M. (2012). TA treatment of depression – A hermeneutic single- case efficacy design study – ‘Denise’. *International Journal of Transactional Analysis Research, 3,* 3-14.

Worden, B.L., DiLoreto, J., & Tolin, D.F. (2014). Insight and motivation. In Frost, S. (ed) *The Oxford handbook of hoarding and acquiring*. NY: Oxford University Press, 247-259.

Worden, B.L., Bowe, W.M. & Tolin, D.F. (2017). An open trial of cognitive behavioural therapy with contingency management for hoarding disorder. *Journal of Obsessive-Compulsive and Related Disorders, 12*, 78-86. doi: 10.1016/j.jocrd.2016.12.005

[Williams, M](https://www.ncbi.nlm.nih.gov/pubmed/?term=Williams%20M%5BAuthor%5D&cauthor=true&cauthor_uid=26795499) & [Viscusi, J.A](https://www.ncbi.nlm.nih.gov/pubmed/?term=Viscusi%20JA%5BAuthor%5D&cauthor=true&cauthor_uid=26795499). (2016). Hoarding disorder and a systematic review of treatment with cognitive behavioral therapy. *Cognitive Behaviour Therapist, 45*, 93-110. doi: 10.1080/16506073.2015.1133697

.

Table 1: *Idiographic variables by baseline, treatment and follow-up*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Idiographic variable | Baseline Mean (*SD*) | Treatment Mean (*SD*) | Follow-up Mean (*SD*) | *F* Value | Partial eta² |
| Fantasy proneness ¹ | 3.12 (1.45) | 3.38 (1.41) | 4.36 (1.42) | **8.55** \* | .04 |
| Frequency of Acquisition ¹ | 1.43 (1.23) | 1.58 (1.00) | 1.22 (1.08) | 3.60 | .02 |
| Objects stolen ¹ | .08 (.34) | .13 (.39) | .25 (.57) | 2.83 | .02 |
| Objects bought | 1.19 (1.24) | 1.36 (.89) | .85 (.86) | **8.41** \* | .04 |
| Free objects | .36 (.60) | .39 (.75) | .39 (.81) | .01 | .00 |
| Acquired – Allotment | .17 (.47) | .20 (.52) | .05 (.28) | 4.27 | .02 |
| Acquired – Clothes | .14 (.41) | .19 (.43) | .28 (.58) | 1.44 | .01 |
| Acquired – Household | .70 (1.19) | .66 (.82) | .60 (.85) | .20 | .00 |
| Acquired – Information | .87 (.71) | 1.13 (.77) | .68 (.79) | **9.73** \* | .05 |
| Volume of objects acquired | .37 (.25) | .50 (.32) | .40 (.35) | 2.59 | .01 |
| Frequency of discard ¹ | 1.32 (.95) | 1.20 (.98) | 1.18 (.98) | .14 | .00 |
| Discarded – Allotment | .12 (.33) | .09 (.29) | .04 (.26) | 1.37 | .01 |
| Discarded – Clothes | .41 (.79) | .17 (.57) | .11 (.35) | 2.60 | .01 |
| Discarded – Household | .96 (.81) | 1.00 (.86) | 1.06 (.92) | .13 | .00 |
| Discarded – Information | .18 (.39) | .09 (.44) | .09 (.40) | .21 | .00 |
| Volume of objects discarded | .48 (.33) | .49 (.37) | .39 (.35) | 1.62 | .01 |
| Morning anxiety ¹ | 5.59 (2.09) | 5.71 (1.38) | 4.58 (1.81) | **4.45 \*** | .02 |
| Afternoon anxiety ¹ | 4.18 (2.46) | 4.30 (1.11) | 4.25 (1.46) | .06 | .00 |
| Evening anxiety ¹ | 3.65 (2.45) | 3.66 (1.30) | 4.02 (1.40) | 1.14 | .01 |

*Note.* ¹ Primary idiographic variables; transformed values reported for all acquisition and discard variables (*n=*15); unadjusted group means and *SD*

reported for all variables; significant *F* values marked in bold; *\* p* ≤ .01; all values rounded to two decimal places.

Table 2: *Nomothetic measures at baseline, treatment and follow-up*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Measure | Caseness cut-off | Reliable change | Clinically significant change | Clinical sample mean (*SD*) | Non-clinical sample mean  (*SD*) | Reliability coefficient | Baseline (T score) | Treatment (T score) | Follow-up  (T score) |
| BDI | 17.00 | 10.41 | 14.02 | 20.44 (13.28) | 10.04 (8.23) | 0.92 | **30.00**  **(severe)** | **20.00** ¹ **(moderate)** | 14.00 ¹ ²  (mild) |
| BSI: global severity index | 63.00  (t-score) | 0.61 | 0.49 | 1.20 (0.70) | 0.25 (0.24) | 0.90 | **1.84 (80.00)** | **0.75** ¹ ²  **(66.00)** | **0.75**  **(66.00)** |
| SI-R total | 41 | 13.17 | 43.22 | 62.00 (12.7) | 23.7 (13.2) | 0.86 | **69.00** | **70.00** | **67.00** |
| SI-R acquisition | 9 | 7.02 | 9.92 | 15.2 (5.4) | 6.4 (3.6) | 0.78 | **21.00** | **21.00** | **22.00** |
| SI-R clutter | 17 | 5.79 | 17.89 | 26.9 (6.6) | 8.2 (7.1) | 0.90 | **24.00** | **24.00** | **23.00** |
| SI-R discarding | 14 | 4.6 | 14.5 | 19.8 (5.0) | 9.2 (5.0) | 0.89 | **24.00** | **25.00** | **22.00** |
| CIR bedroom | 4 | 1.99 |  | 4.34 (2.16) |  | 0.89 | **8.67** |  | **8.67** |
| CIR kitchen | 4 | 1.85 |  | 3.79 (2.01) |  | 0.89 | **9** |  | **8.67** |
| CIR living room | 4 | 2.06 |  | 3.87 (2.24) |  | 0.89 | **9** |  | **8.33** |

*Note*: ¹ Positive reliable change index change score achieved, as in the difference between the measures is beyond statistical chance; ² clinically significant change achieved as in the score is within the range of the community sample on the psychometric norms; items in **bold** indicate clinical caseness at that point in time; reliability coefficients based on estimates of internal consistency (BDI and CIR) and test-retest reliability (BSI and SI-R); reliable change calculated using *SD* matched for gender and clinical presentation where possible (i.e. outpatient and/or hoarding sample); clinically significant change calculated using sample matched clinical and non-clinical norms; reliable change and clinically significant change scores rounded to the nearest whole number; BSI caseness represented as a T score; norms taken from Beck et al., 1996 (BDI); Derogatis, 1993 (BSI); Frost et al., 2004 and Tolin, Meunier, Frost, Steketee, 2011 (SI-R); and Frost et al., 2008 (CIR); average scores reported for BSI; CIR nonclinical norms not available so clinically significant change not calculated.

Table 3: *Summary of changes noted in the Change Interview and associated ratings*

|  |  |  |  |
| --- | --- | --- | --- |
| Change | Expectancy | Likelihood | Importance |
| *Started working (before I never did any work) ¹* | 5 | 1 | 5 |
| *Able to set my own realistic goals and act on it ¹* | 2 | 1 | 5 |
| *I get satisfaction from doing the boring and hard work ¹* | 4 | 1 | 5 |
| *Therapy has brought to the forefront my living in a fantasy world ¹* | 2 | 1 | 5 |
| *Sense of determination to change things (problems) ²* | 2 | 1 | 5 |
| *Learnt that I live in a fantasy life ²* | 4 | 2 | 5 |
| *Noticed that I have a superior attitude ²* | 5 | 1 | 5 |
| *Leant that people are more important than hobbies ²* | 4 | 2 | 4 |

*Note*: ¹ change identified during end of treatment interview; ² change identified during end of follow-up interview; expectancy rated from 1 to 5 (very much expected, somewhat expected, neither, somewhat surprised, very much surprised); likelihood rated from 1 to 5 (very unlikely, somewhat unlikely, neither, somewhat likely, very likely); importance rated from 1 to 5 (not at all, slightly, moderately, very, extreme

Table 4: *Summary of the affirmative and sceptic research team debate*

|  |  |  |
| --- | --- | --- |
|  | Type of evidence | Example(s) and source |
| Affirmative brief | Retrospective attribution | * Client described CAT as helpful (SES) * Change due to CAT (CI) * Change scores unlikely and important (CI) * Goodbye letters acknowledge change (goodbye letters) |
| Process-outcome mapping | * Change brought about by CAT tools (CI) * SDR facilitated insight (CI) * Changes listed as exists on SDR * Relationship with therapist (CI) |
| Within-therapy process-outcome correlation | * None |
| Early change in stable patterns | * Long-standing HD unresponsive to CBT (case record) * Clinical and reliable change in BDI and BSI (case record) * Change noted in goodbye letters (goodbye letters) |
| Event-shift sequences | * Change consistent with reformulation, recognition of revision stages of CAT |
| Sceptic brief | Trivial or negative change | * Lack of change on SI-R (case record) * Lack of change on CIR (case record) * Minimal improvement on ideographic measures (case record) * BSI and BDI still caseness (case record) |
| Statistical artefacts | * Preponderance of self-report outcomes * Improving baseline in two ideographic measures (case record) |
| Relational artefacts | * Trying to please the therapist (CI) * Scripted account of therapy (CI) |
| Expectancies | * Scripted account of therapy (client goodbye letter) |
| Outside therapy life events | * Loss of further motivated the client |
| Self-correction processes | * None |
| Reactive effects of research | * None |
| Psychological factors | * None |

Table 5: *Judges* *ratings of clinical change and the role of therapy*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Judge A | Judge B | Judge C | Median  score |
| To what extent did the client change? | 0% | 20% | 20% | 20% |
| How certain are you? | 100% | 80% | 40% | 80% |
| To what extent is this due to therapy? | N/A | 20% | 60% | 40%¹ |
| How certain are you? | 100% | 60% | 40% | 60% |

*Note:* No change:0%, slight change: 20%, moderate change: 40%, considerable change: 60%,

Substantial change: 80%, complete change: 100%

¹ mean score calculated.