Investigating the Diagnostic Specificity of Attachment and Relational Needs in Hoarding Disorder

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Highlights

- Poor parental bonding is relevant, but not specific, to hoarding disorder
- Insecure attachment styles are relevant, but not specific, to hoarding disorder
- Perceptions of loneliness are relevant, but not specific, to hoarding disorder
- Poor social support is particularly problematic for those with hoarding disorder

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All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated sufficiently in the work to take public responsibility for the content, including participation in the concept, design, analysis, writing, or revision of the manuscript. Furthermore, each author certifies that this material or similar material has not been and will not be submitted to or published in any other publication before its appearance in the *Journal of Obsessive Compulsive and Related Disorders*.

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Please indicate the specific contributions made by each author (list the authors' initials followed by their surnames, e.g., Y.L. Cheung). The name of each author must appear at least once in each of the three categories below.

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Abstract

Background: Excessive emotional attachments to objects in hoarding may represent a compensatory strategy for unmet attachment and relational needs. **Aims:** This study aimed to clarify the extent and specificity of attachment and interpersonal needs in hoarding disorder compared to obsessive compulsive disorder (OCD) and healthy controls (HC). The primary aim of the study was to investigate the specificity of poor bonding with key attachment figures in childhood, and attachment insecurity in current relationships. Secondly, present-day interpersonal interactions, including loneliness and social support, were assessed for diagnostic specificity. **Methods**: A cross-sectional between-groups design was used to compare scores on measures in those with hoarding (n = 38); OCD (n = 46); and HCs (n = 49). **Results**: Individuals with hoarding reported diminished parental bonding, greater attachment insecurity and loneliness in current relationships compared to HCs. The clinical groups did not differ from each other. The hoarding group reported the poorest levels of social support. **Conclusions**: These results suggest interpersonal attachment and relational needs are relevant, but not diagnostically specific, to hoarding. Poor social support is particularly heightened in those with hoarding compared to OCD. Longitudinal and interventional research evaluating the impact of interventions addressing social support on object attachment is needed.

Key Words: Hoarding Disorder, Parental Bonding, Attachment, Social Support, Loneliness

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1. Introduction

Hoarding disorder is a mental health condition affecting approximately 2.5% of the population in developed countries (Postlethwaite et al., 2019). It is recognised as a distinct psychological disorder, after previously being categorised under the umbrella of obsessive compulsive disorder (OCD; American Psychiatric Association, 2013). Hoarding disorder is defined by distress and difficulty parting with possessions, regardless of their monetary value. Difficulty parting with possessions, which can be accompanied by excessive acquisition of objects, gives rise to the build-up of clutter in the home. Hoarding represents a clinical and social challenge, with meta-analyses indicating that only a third of patients with hoarding disorder report clinically significant improvements in response to cognitive and behavioural treatments (Tolin et al., 2015). Sufferers report high levels of anxiety and depression, as well as a range of interpersonal difficulties such as familial conflict and social isolation (Frost et al., 2011; Drury et al., 2014). There remains a serious need for expanding our understanding of etiological and maintenance factors in hoarding disorder.

One factor thought to play a central role in the maintenance of hoarding disorder is excessive emotional attachment to possessions (Frost & Hartl, 1996). Strong emotional attachments to possessions are represented by beliefs that objects represent safety signals, are comforting, and may possess human-like qualities (Steketee et al., 1998). These beliefs are thought to lead to problems discarding objects and reflect concerns such as "this possession is my friend so I must keep it" or "if I get rid of this item, it's like abandoning someone I love" (Gordon et al., 2013). The importance of emotional attachment beliefs in hoarding disorder is represented in a more recent conceptualisation of hoarding as a behavioural outcome, resulting from at least three different domains of cognition that may vary between people who hoard. That is, people who hoard may do so

because of one or more of the following pathways: (a) problematic patterns of attachment being displaced from relationships with people onto relationships with possessions; (b) fear of material deprivation leading to accumulation to prevent future deprivation; and (c) harm avoidance and retention of objects to prevent harm to others (as in OCD). Gordon and colleagues (2013) developed and validated the Beliefs About Hoarding questionnaire (BAH) to explore the merit and specificity of such cognitions in hoarding. The study identified that people who hoard, with and without a comorbid diagnosis of OCD, endorsed heightened beliefs about attachment to possessions, and fear of future material deprivation compared to individuals with OCD and healthy controls (HC). Whilst the study demonstrated a specificity of emotional attachment to possessions among hoarders, the processes that give rise to such beliefs remain unclear. It has been hypothesised that emotional attachments and the personification of items represent a process of compensating for disrupted or absent meaningful relationships with people (Burgess et al., 2018; Yap & Grisham, 2019).

Due to the historical overlap between OCD and hoarding, the literature investigating attachment and interpersonal processes has been clouded by the recruitment of hoarding samples with comorbid or primary diagnoses of OCD (Mathes et al., 2020). It remains unclear as to whether disrupted interpersonal needs are unique to hoarding disorder or represent disorder nonspecific features of both hoarding disorder and OCD. To expand the current understanding of hoarding, an investigation of the extent and diagnostic specificity of historical and present-day relational difficulties in hoarding disorder is needed.

1.1 Attachment Theory and Hoarding

The use of objects for comfort as compensation for thwarted interpersonal needs mirrors psychodynamic conceptualisations of attachment theory. Attachment theory is

rooted in the notion that humans have a basic need for social connection and seek out a sense of security and belongingness from their relationships (Bowlby, 1977). In particular, perceptions of bonding with parents in childhood inform the ability to seek security and belongingness in adulthood (Ainsworth, 1991). When the parent-child relationship is experienced as consistently caring and emotionally safe, it permits the development of a secure attachment style that persists into adulthood. Individuals who develop a secure attachment style are consequently able to experience and contribute to secure adult relationships. Conversely, children who experience caregivers as consistently unreliable, unsafe or uncaring develop insecurity in interpersonal relationships, which is likely to persist into adulthood (Mikulincer & Shaver, 2012). In the event of feeling highly anxious about the value of the self, and unsure of the reliability of others to provide consistent comfort, it could be hypothesised that one might seek to meet attachment needs through reliance on objects. Unlike relationships with other people, objects may be perceived as exceptionally predictable and reliable, as they "lack agency and can be summoned when needed" (Keefer et al., 2012, p. 913). In the context of hoarding disorder, it is hypothesised that such compensatory strategies may include overreliance on objects through the displacement of attachments onto objects. As a proxy measure of attachment relationships in childhood, diminished parental care has been associated with hoarding symptoms amongst those with a primary diagnosis of OCD (Chen et al., 2017). Individuals with hoarding disorder also recall lower levels of warmth in their families of origin compared to healthy control participants (Kyrios et al., 2018). Some studies have also demonstrated a link between attachment insecurity in current relationships and hoarding symptoms. These studies, however, rely on non-clinical samples (Neave et al., 2016) or underpowered clinical samples with a primary diagnosis of OCD (Nedelisky & Steele, 2009). Only one study has examined the specificity of

attachment insecurity in hoarding compared to a mixed clinical group (Grisham et al., 2018). The findings suggest attachment insecurity represents a shared feature of psychopathology, rather than a disorder-specific feature of hoarding. Attachment insecurity in present-day relationships, however, has not yet been assessed for specificity in hoarding populations compared to a closely related clinical group with OCD.

1.2 Loneliness, Social Support and Hoarding

Emotional attachments to possessions in hoarding disorder may also reflect issues with the quality of present-day relationships, including loneliness and poor social support (Grisham & Barlow, 2005; Medard & Kellett, 2014). Although possessions may be sought out for comfort and safety in the absence of reliable interpersonal relationships, objects cannot provide actual reciprocal care. Attachment needs thus remain unmet in this client group, possibly strengthening dysfunctional relationships with possessions and exacerbating interpersonal difficulties (Mathes et al., 2020). In an effort to protect and save possessions with which emotional attachments are built, the resultant clutter can become a source of further interpersonal problems with families and friends. Therefore, although attachments to possessions may represent efforts to compensate for poor interpersonal relationships, objects do not actually satisfy interpersonal needs and instead may perpetuate social isolation. Consistent with these ideas, emotional attachments to objects have been found to mediate the relationship between loneliness and hoarding symptoms in non-clinical samples (Yap et al., 2020). Lack of social support has also been identified as elevated in those with hoarding disorder compared to HCs (Medard & Kellett, 2014). The literature on attachment and relational needs in hoarding, however, is limited to exploring associations between interpersonal problems and hoarding in non-clinical samples, or in those with primary diagnoses of OCD (Mathes et al., 2020). Assessment of the extent and specificity of interpersonal issues hypothesised to relate to

overreliance on objects for comfort may inform our understanding of factors that maintain hoarding problems.

1.3 Aims and Hypotheses

The present study's primary aim was to extend the research by evaluating the specificity of attachment insecurity in hoarding compared to OCD and HCs. Attachment was assessed via (a) perceived parental bonding as a proxy measure of attachment in childhood and (b) attachment style in adult relationships, characterised by anxious and avoidance-related behaviour (Griffin & Bartholomew, 1994). Secondly, this study evaluated the extent and specificity of loneliness and social support in hoarding compared to OCD and HC groups. Parental bonding, insecure attachments in relationships, loneliness, and social support were predicted to be poorest in the hoarding group, followed by the OCD group, followed by the HC group.

2 Method

2.1 Design

The study employed a cross-sectional between-subjects design with three groups (hoarding, OCD, HC). Ethical approval for the study was granted by the Medical Sciences Interdivisional Research Ethics Committee at the University of Oxford (REF: R64103/RE001).

2.2 Participants

Power analysis for a three-group independent measures ANOVA (with power at .80, α = .05) indicated that 37 participants per group were required to detect a medium effect size. A total of 168 participants were interviewed over the phone using the hoarding and OCD modules of the Structured Clinical Interview for DSM-5 Axis I disorders (SCID-V; First et al., 2015). Volunteers were invited to participate if they were over the age of 18, with no upper age limit. Participants were excluded if there was

evidence of organic brain injury or substance abuse. Seven individuals in the HC group identified accessing psychological support in the past 10 years, and three at the time of the study, but did not consider themselves to have significant mental health problems. Anxiety and depression scores were examined in the HC group. None met clinical significance and thus were included in the study.

Fifteen participants were excluded at screening for not meeting inclusion criteria. One hundred and fifty-three participants were invited to complete the questionnaires, with a total of 144 completing them. Eleven individuals met criteria for both OCD and hoarding. For the purpose of this study, these participants' data were excluded from analyses. A total of 38 people with hoarding disorder, 46 people with OCD, and 49 HCs were recruited.

2.3 Procedure

2.3.1 Service User Consultation

Adult attachment-related behaviours are measured either by interview, observation, or self-report. Self-report measures of attachment have good test-retest reliability and confer advantages to interview and observation regarding length of time to administer, which reduces participant burden (Graham & Unterschute, 2015). Attention in adult attachment has focused on whether adult attachment should be measured based on a four-category model (i.e., an individual's style of attachment and views of the self and other) or dimensionally (i.e., evaluating internal working models based on levels of attachment avoidance and anxiety; Zortea et al., 2019). The two-dimensional model fits the data of adult attachment more robustly, demonstrating higher construct validity compared to the four factor categorisation (Stein et al., 2002; Zortea et al., 2019). Therefore, a dimensional approach to adult attachment was the preferred approach for measuring attachment insecurity.

Piloting of three, brief self-report measures of attachment-related behaviours in current relationships was carried out with a focus group of four individuals with hoarding disorder. The Experience in Close Relationships – Relationship Structures (ECR-RS; Fraley et al., 2011), Adult Attachment Questionnaire (AAQ; Simpson, 1996), and Relationship Scales Questionnaire (RSQ; Griffin & Bartholomew, 1994) were compared for coherence, clarity, ease of use, and participant burden. The RSQ was felt to best capture a range of attachment-related concerns and behaviours experienced in close relationships for those with hoarding problems.

2.3.2 Recruitment and Screening

Participants were recruited on social media, and through voluntary organisations across the UK such as OCD Action, OCD UK, and Hoarding Disorders UK. Social media (Facebook and Twitter) were used to reach participants across the UK. The HC group were recruited via i) social media, ii) social groups for older adults in the UK, and iii) snowball sampling via individuals in the hoarding and OCD groups. Snowball sampling was used where possible to improve the validity of the findings by recruiting participants from similar geographic and sociodemographic brackets. Participant data was collected from June 2019 to March 2020.

A telephone screening procedure was implemented to gain consent and determine group allocation. All participants were invited to complete the Hoarding and OCD modules of the SCID-V. The interview was administered by a graduate student trained in the SCID-V, with supervisory support. Participants who met criteria for either the hoarding, OCD, or HC group were then invited by email to access the questionnaires on Qualtrics. Participants were given a unique participant identification code to ensure anonymity and match the online responses to the interview. Questionnaire packs sent in

the post for participants without internet access were also identified with unique participant identification codes.

2.3.3 Questionnaires

Participants were invited to complete a battery of self-report demographic and psychometric measures taking approximately 45 minutes. On completion, participants were offered a choice of a £2 donation to either a hoarding or OCD charity. Online debriefing procedures in line with information governance procedures were provided, with a list of relevant contact details and self-help resources in the UK for mental health difficulties.

2.4 Measures

2.4.1 Psychopathology

Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001). The PHQ9 is a nine-item self-report measure of symptoms of depression in the past two weeks, aligning with DSM-IV Major Depression criteria (American Psychiatric Association, 2013). Participants are invited to comment on the frequency of these symptoms on a four-point scale (0=*not at all,* 1=*several days,* 2=*more than half the days,* 3=*nearly every day*). The PHQ9 demonstrates excellent internal reliability (Cronbach's α = .92) and excellent test-retest reliability (Kroenke et al., 2001).

Generalised Anxiety Disorder assessment (GAD7; Spitzer et al., 2006). The GAD7 is a seven-item self-report measure using a four-point scale for brief screening of severity of anxiety symptoms over the past two weeks (0=*not at all,* 1=*several days,* 2=*more than half the days,* 3=*nearly every day*). The GAD-7 demonstrates excellent internal consistency (Cronbach's α = .94) and good test-retest reliability (interclass correlation = .83).

Obsessive Compulsive Inventory Short Version (OCI-R; Foa et al., 2002). The Revised OCI (OCI-R) is an 18-item self-report measure designed to assess for

symptoms of OCD. It has six subscales: checking, washing, obsessing, mental neutralising, ordering, hoarding, and doubting. The tool demonstrates good to excellent test-retest reliability across a two-week time period for OCD patients (*rs* = .74–.91) and for non-anxious controls (*rs* = .58–.87). The OCI-R demonstrates excellent internal consistency (Cronbach's α = .90).

The Saving Inventory Revised (SI-R; Frost et al., 2004). The Saving Inventory Revised (SI-R) is a 23-item self-report measure of hoarding with three subscales: difficulty discarding, clutter and acquisition. The clinical cut-off for hoarding is a score of 41 and above. Analysis of the SI-R items demonstrate excellent internal consistency for clutter, discarding, and acquisition (α = .96), and good test-retest reliability *(r* = .78).

Beliefs About Hoarding Questionnaire (Gordon et al., 2013). The BAH is a 28-item self-report measure designed to assess beliefs and experiences characteristic of hoarding disorder. The BAH offers three scores that provide a clear distinction between hoarding motivated by (a) abnormal emotional attachments to objects; (b) material deprivation; and (c) harm avoidance. Participants are asked to rate the degree of their belief from 0–100, where 0 is "I did not believe this at all" and 100 is "I was completely convinced this was true". The BAH demonstrates high overall internal consistency (α = .96) and high internal consistency for subscales (harm avoidance α = .79, attachment disturbance α = .93, material deprivation α = .93). The measure demonstrates good test-retest reliability in those with hoarding disorder (*r* = .83).

2.4.2 Parental Bonding

Parental Bonding Instrument (PBI; Parker et al., 1979). The Parental Bonding Instrument (PBI) measures early affectional ties between children and their parents in the first 16 years (Myhr et al., 2004; Wilcox et al., 2008). The PBI contains 12 "care" items (e.g. "spoke to me in a warm and friendly voice") and 13 *overprotection* items (e.g. "tried

to control everything I did" reverse scored). The care items refer to experiences of love, warmth, and attentiveness from parents or experiences of the parent as cold and indifferent. The overprotection item refers to the encouragement of behavioural freedom or denial of psychological autonomy and infantilisation. Each parent is scored on a 4-point Likert scale from 0 (*very like*) to 3 (*very unlike me*). All scales on the PBI demonstrate high test-retest reliability after 34 weeks (Mother/Care r = .89, Mother/Overprotection r = .88, Father/Care r = .89, Father/Protection r = .74). The 'care' subscale demonstrates excellent internal consistency (α = .92). The 'overprotection' subscale demonstrates good internal consistency (α = .88).

2.4.3 Attachment in Current Relationships

Relationship Scales Questionnaire (RSQ; Griffin & Bartholomew, 1994). The RSQ is a 30-item self-report measure for describing feelings about close relationships. The measure examines attachment-related behaviours in current relationships that map onto either the four categories or two dimensions of adult attachment-related behaviours (Griffin & Bartholomew, 1994). The scale demonstrates good internal consistency (α = .83). Confirmatory factor analyses demonstrate that a two-dimensional approach to the RSQ is psychometrically optimal (Stein et al., 2002; Zortea et al., 2019), yielding good discriminant validity (*htmt[A,V]* = .52) and reliability (anxiety ω = .86, SE = .012, 95%CI [.84–.89]; avoidance ω = .83, SE = .013, 95%CI [.80–.86]).

2.4.4 Loneliness

UCLA Loneliness Scale (UCLA; Russell et al., 1980). The UCLA is a 20-item self-report measure of loneliness. Half of the questions are worded positively (e.g., "how often do you feel there are people that really understand you?") and half are worded negatively (e.g., "how often do you feel left out?"). Participants are invited to rate the statements on how frequently they experience the items, using a 4-point Likert scale,

where 1=*never* and 4=*often*. The scale demonstrates good internal consistency (α = .94) and test-retest reliability after one year (*r* = .73).

2.4.5 Social Support

Medical Outcome Study Social Support Survey (MOS-SSS; Sherbourne & Stewart, 1991). The MOS-SSS is a 20-item self-report measure that captures the perceived social support needs of individuals with chronic conditions. The first item of the MOS-SSS invites participants to estimate the number of close friendships they have. It has 19 additional items that are divided into five subscales: perceived adequacy of tangible support, informational and emotional support, positive social interaction, and affectionate support. Each item is rated on a 5-point Likert scale to indicate how often the respondent receives the support (1=*none of the time*, 5=*all of the time*). Scores range from 0–100, with 100 indicating higher levels of perceived social support. The MOS-SSS demonstrates good internal consistency (α = .97), and good test-retest reliability after one year (*r* = .78).

2.5 Data Analysis

Categorical data were compared using chi-square analyses. Chi-square analyses were partitioned to identify differences between groups. Continuous data were assessed for assumptions of normality. Where assumptions of normality were met, as determined by Shapiro-Wilk tests, analysis of variance (ANOVA) tests were run. Bonferroni corrections were applied to post-hoc analyses to preserve the Type 1 error rate. Partial eta squared (η_p^2) was calculated for ANOVAs as a measure of effect size (Levine & Hullett, 2002). When assumptions of parametric data were not met, data were compared using the Kruskall-Wallis (KW) test. Eta squared (η^2) was calculated for KW tests as a measure of effect size. When KW tests were significant, pairwise comparisons were interpreted using

Dunn's (1964) procedure with a Bonferroni adjustment. Statistical significance was accepted at the $p < .016$ level for multiple comparisons.

A small amount of missing data was observed. For participants who used Qualtrics, there were no single item missing data points. Where the last or second-to-last questionnaires were not completed, participants' data on these measures were not included in analyses for the missing measures only. This is reflected in the sample size per analysis. For the 11 people who completed paper copies of the questionnaire, where data were missing, participants' data on the scale were not included in the analysis. Overall, sample sizes varied from 137 to 148.

3 Results

3.1 Sociodemographic Characteristics and Psychopathology

The demographic characteristics of the three groups are shown in Table 1. A summary of clinical characteristics can be found in Table 2.

Table 1

Sociodemographic Characteristics of Hoarding, OCD, and HC groups

	Hoarding (n = 38)		OCD (n = 46)		HC (n = 49)		H Statistic
	Mdn	*IQR*	*Mdn*	*IQR*	*Mdn*	*IQR*	
Age (years)	59.50[a]	14.00	38.00[b]	18.00	63.00[a]	22.00	$H(2) = 45.77$, $p < .001$, $\eta^2 = .355$
	N	%	*N*	%	*N*	%	Chi-square Statistic
Female	26[a]	70.3%	31[a]	67.4%	31[a]	63.3%	$\chi^2_{(2)} = .482$, $p = .786$
Caucasian	37[a]	97.4%	43[a]	93.5%	44[a]	91.7%	$\chi^2_{(2)} = 1.24$, $p = .592$
In a relationship	10[a]	26.3%	22[b]	47.8%	30[b]	61.2%	$\chi^2_{(2)} = 10.52$, $p = .005$
Received Higher Education	19[a]	50%	26[a]	56.6%	39[b]	79.6%	$\chi^2_{(2)} = 9.39$, $p = .009$
Employed	12[a]	31.6%	33[b]	71.7%	22[a]	44.9%	$\chi^2_{(2)} = 14.36$, $p = .001$
Currently in receipt of talking therapy	10[a]	26.3%	12[a]	26.1%	3[b]	6.1%	$\chi^2_{(2)} = 8.12$, $p = .017$
Previously in receipt of talking therapy	26[a]	68.4%	44[b]	95.7%	7[c]	14.3%	$\chi^2_{(2)} = 66.86$, $p < .001$

[abc] Groups that share a superscript are not significantly different on multiple comparisons; those that do not share a superscript are significantly different.

Table 2

Measures of Psychopathology in Hoarding, OCD, and HC Groups

	Hoarding (n = 38)		OCD (n = 46)		HC (n = 49)		H Statistic
	Mdn	*IQR*	*Mdn*	*IQR*	*Mdn*	*IQR*	
PHQ-9	7.00[a]	7.25	7.50[a]	8.25	0.00[b]	2.00	$H(2) = 68.90$, $p < .001$, $\eta^2 = .522$
GAD-7	5.00[a]	6.25	8.50[a]	9.00	0.00[b]	0.50	$H(2) = 66.06$, $p < .001$, $\eta^2 = .500$
OCI-R Total (without Hoarding)	6.50[a]	8.50	20.00[b]	13.00	1.00[c]	4.50	$H(2) = 77.37$, $p < .001$, $\eta^2 = .586$
OCI-R Hoarding	9.00[a]	4.00	2.00[b]	3.00	0.00[c]	1.00	$H(2) = 74.30$, $p < .001$, $\eta^2 = .563$
SI-R	64.00[a]	20.50	16.00[b]	17.25	5.00[c]	7.50	$H(2) = 88.19$, $p < .001$, $\eta^2 = .668$
BAH Harm Avoidance	133.00[a]	112.00	50.00[b]	159.50	11.00[c]	62.00	$H(2) = 30.71$, $p < .001$, $\eta^2 = .242$
BAH Material Deprivation	383.00[a]	357.50	100.50[b]	231.25	50.00[b]	108.00	$H(2) = 52.61$, $p < .001$, $\eta^2 = .415$
BAH Attachment Disturbance	379.00[a]	481.50	125.00[b]	436.50	83.00[b]	96.00	$H(2) = 35.01$, $p < .001$, $\eta^2 = .276$

Note. PHQ9 = Patient Health Questionnaire – 9; GAD7 = Generalised Anxiety Disorder – 7; OCI-R = Obsessive Compulsive Inventory-Revised; SI-R = Savings Inventory Revised; CIR = Clutter Image Rating Scale; BAH = Beliefs About Hoarding.

[abc] Groups that share a superscript are not significantly different on multiple comparisons; those that do not share a superscript are significantly different.

3.2 Analysis According to the Primary Hypothesis

3.2.1 Parental Bonding Instrument

KW tests were used to assess differences in perceived parental care and overprotection scores between the groups: hoarding (n = 34), OCD (n = 45), and HC (n = 49). Median parental care scores were significantly different between groups: $H(2) = 8.97$, $p = .001$, $\eta^2 = .071$ (Table 3). The post-hoc analysis revealed significant differences in median parental care scores between the hoarding (*Mdn* = 40.00, IQR = 32.50) and HC groups (*Mdn* = 56.50, IQR = 23.75; $p = .004$). There was no statistically significant difference between the hoarding and OCD groups (*Mdn* = 50.00, IQR = 35.50; $p = .372$), or the OCD and HC groups ($p = .036$). Median parental overprotection scores were statistically significantly different between groups: $H(2) = 13.38$, $p = .001$, $\eta^2 = .105$. Post-hoc analysis revealed significant differences in median parental overprotection scores between the hoarding (*Mdn* = 25.50, IQR = 20.50) and HC groups (*Mdn* = 14.50, IQR = 14.00; $p = .002$). There was a significant difference between the OCD (*Mdn* = 27.50, IQR = 21.50) and HC groups ($p = .002$). There was no significant difference between the hoarding and OCD groups ($p = .820$).

Table 3

Average Scores on Variables Relating to the Key Hypotheses Between Hoarding, OCD, and HC Groups.

	Hoarding (n = 38)		OCD (n = 46)		HC (n = 49)		H Statistic
	Mdn	*IQR*	*Mdn*	*IQR*	*Mdn*	*IQR*	
PBI Parental Care	40.00[a]	32.50	50.00[ab]	35.50	56.50[b]	23.75	$H(2) = 8.97$, $p = .001$, $\eta^2 = .071$
PBI Parental Overprotection	25.50[a]	20.50	27.50[a]	21.50	14.50[b]	14.00	$H(2) = 13.38$, $p = .001$, $\eta^2 = .105$.
RSQ Anxious	17.50[a]	12.75	20.50[a]	11.00	7.00[b]	9.75	$H(2) = 43.10$, $p < .001$, $\eta^2 = .337$
RSQ Avoidant	11.00[a]	6.25	11.00[ab]	7.00	8.00[b]	5.00	$H(2) = 11.57$, $p = .003$, $\eta^2 = .091$
MOS-SSS Perceived Social Support	54.00[a]	27.00	71.50[b]	25.25	84.50[c]	30.75	$H(2) = 25.98$, $p < .001$, $\eta^2 = .203$
MOS-SSS Number of Close Friends	4.00[a]	5.00	5.00[a]	5.00	7.00[b]	7.00	$H(2) = 18.03$, $p < .001$, $\eta^2 = .141$
	M	*SD*	*M*	*SD*	*M*	*SD*	F Statistic
UCLA Loneliness Scale	47.10[a]	13.76	48.86[a]	12.09	31.49[b]	15.29	$F(2,110) = 19.41$, $p < .001$, $\eta_p^2 = .261$

Note. PBI = Parental Bonding Instrument; RSQ = Relationship Scales Questionnaire; MOS-SSS = Medical Outcome Study Social Support Survey; UCLA = UCLA Loneliness Scale; ACE-IQ = Adverse Childhood Experiences International Questionnaire.
[abc] Groups that share a superscript are not significantly different on multiple comparisons; those that do not share a superscript are significantly different.

3.2.2 Relationship Scales Questionnaire (RSQ)

KW tests were used to assess differences in attachment-related anxiety and avoidance in present-day relationships between the groups: hoarding (n = 37), OCD (n = 44), and HC (n = 48). Median Anxiety scores were significantly different between groups: $H(2) = 43.10$, $p < .001$, $\eta^2 = .337$. Post-hoc analysis revealed significant differences in median Anxiety scores between the hoarding (*Mdn* = 17.50, IQR = 12.75) and HC groups (*Mdn* = 7.00, IQR = 9.75; p < .001). There was a significant difference between the OCD (*Mdn* = 20.50, IQR = 11.00) and HC groups (p < .001). There was no significant difference between the hoarding and OCD groups (p = .469). Median Avoidance scores were significantly different between groups: $H(2) = 11.57$, p = .003, η^2 = .091. Post-hoc analysis revealed significant differences in Median Avoidance scores between the hoarding (*Mdn* = 11.00, IQR = 6.25) and the HC group (*Mdn* = 8.00, IQR = 5.00; p = .001). There was no significant difference between the hoarding and OCD groups (*Mdn* = 11.00, IQR = 7.00; p = .201), or the OCD and HC groups (p = .033).

3.3 Analysis According to Secondary Hypothesis

3.3.1 UCLA Loneliness Scale

A one-way ANOVA was carried out on the UCLA Loneliness Scale between the hoarding (n = 31), OCD (n = 37), and HC groups (n = 47). The analysis revealed a significant difference in self-reported loneliness between groups $F_{(2,110)} = 19.41$, $p < .001$, $\eta_p^2 = .261$ (Table 3). Post-hoc comparisons found no significant difference in loneliness between the hoarding (M = 47.10, SD = 13.76) and OCD groups (M = 48.86, SD = 12.09; p = .602). Both clinical groups reported significantly higher levels of loneliness than the HC group (M = 31.49, SD = 15.29; p values < .001).

3.3.2 Medical Outcome Study Social Support Survey (MOS-SSS)

The MOS-SSS has two scales: total perceived social support and total number of close friends. These two subscales were analysed separately between groups: hoarding (n =

37), OCD (n = 44), and HC (n = 48). There was a significant difference in perceived social support between groups: $H(2) = 25.98$, $p < .001$, $\eta^2 = .203$. Post-hoc analysis revealed statistically significant differences in median social support scores between the hoarding (*Mdn* = 54.00, IQR = 27.00) and HC groups (*Mdn* = 84.50, IQR = 30.75; $p < .001$). There was a significant difference between the hoarding and OCD groups (*Mdn* = 71.50, IQR = 25.25; $p = .013$). There was a significant difference between the OCD and HC groups ($p = .007$).

There was a significant difference in the total number of friendships reported by participants in the groups: $H(2) = 18.03$, $p < .001$, $\eta^2 = .141$. Post-hoc tests revealed a significant difference between the hoarding (*Mdn* = 4.00, IQR = 5.00) and HC groups (*Mdn* = 7.00, IQR = 7.00; $p < .001$), and between the OCD (*Mdn* = 5.00, IQR = 5.00) and HC groups ($p = .002$). There was no significant difference between the hoarding and OCD groups ($p = .350$).

4 Discussion

4.1 Summary of Findings

The primary aim of the study was to evaluate the extent and specificity of the following factors in hoarding disorder: (a) bonding with parents in childhood, as a proxy measure of the early affectional ties between child and caregivers, and (b) attachment style in adult relationships, characterised by anxious and avoidance-related behaviours. Perceptions of poor parental bonding, and attachment-related anxiety and avoidance in current relationships, were elevated in those with hoarding compared to the HC group. Hoarding and OCD groups did not differ from each other. The secondary aim of the study was to evaluate the extent and specificity of loneliness and poor social support in hoarding compared to OCD and HC groups. Loneliness was elevated in the hoarding group compared to the HC group. Clinical groups did not differ from each other. The hoarding group reported having the least

amount of social support, despite reporting a similar number of total friendships as the OCD group.

4.2 Theoretical Implications

Findings in this study suggest that a number of interpersonal factors are relevant, but not specific, to hoarding disorder. The findings contribute to the current understanding of impaired parent-child interactions in hoarding, providing further contextual information on how hoarding behaviours may form. Diminished parental bonding, as measured by lack of care and overcontrol, was found to be associated with hoarding disorder. These findings are consistent with Chen and colleagues' (2017) study, identifying that lack of maternal warmth and care is associated with hoarding symptoms amongst individuals with a primary OCD diagnosis. The present study extends these findings by identifying that diminished parental care and overprotection are relevant, but not specific, to hoarding without OCD. In response to overcontrolling, inattentive, and emotionally cold parenting styles, objects could be used to compensate for poor attachments to caregivers earlier in life (Chen et al., 2017). Higher incidences of poorer bonding between child and parent in the hoarding group compared to HCs could feasibly indicate that hoarding behaviours may emerge as one strategy for securing safety and comfort in the absence of reliable relationships with key attachment figures (Keefer et al., 2012). However, poorer experiences of bonding with parents do not appear to be unique to those with hoarding disorder, and more likely represent a disorder nonspecific factor.

The study identified that attachment insecurity, as measured by anxiety and avoidance in relationships, is relevant but not diagnostically specific to hoarding. The identification of attachment insecurity as a shared feature of psychopathology, including hoarding, is consistent with Grisham and colleagues' (2018) findings. Emotional attachment to possessions, as identified by the BAH questionnaire however, appears to be hoarding

specific. Elevated anxious and avoidant attachment styles in hoarding may point to negative views of the self and views of others as unreliable. Emotional attachments to objects may be a more attractive strategy for securing safety and comfort than relationships for individuals who hold views of others as unreliable or unavailable. The findings of this study lend support to existing theories that underlying difficulties in attachment insecurity interact with disorder-specific beliefs about the comfort and security possessions can offer, to give rise to hoarding (Yap & Grisham, 2020). It is also possible that individuals with hoarding disorder could represent a heterogenous group of individuals, which could account for the lack of diagnostic specificity identified. Hoarding behaviours can be motivated by several different beliefs, such as harm avoidance, material deprivation, and emotional attachments (Gordon et al., 2013). Different types of adversity early in life could feasibly influence different pathways that give rise to hoarding as a final behavioural outcome. For example, poverty or displacement from the home may be particularly relevant for individuals whose hoarding is motivated by fears of material deprivation (Landau et al., 2011). Interpersonal trauma, such as physical or sexual violence, may be particularly relevant for hoarding motivated by substitutional beliefs about objects as safe and comforting (Shaw et al., 2016). The mechanisms that link attachment insecurity to hoarding remain unclear and require further exploration in future research.

Regarding difficulties in present-day relationships, findings suggest loneliness is elevated in individuals with hoarding disorder compared to HCs. These findings extend the research of Yap and colleagues (2020), who identified that emotional attachments to possessions mediate the relationship between loneliness and hoarding in non-clinical samples. The present study identified that although loneliness is elevated in people with hoarding disorder, it is not unique to hoarding. Poor social support, however, is significantly higher in hoarding disorder, compared to those with OCD and HCs. These findings extend Medard and Kellett's (2014) research suggesting individuals with hoarding disorder

experience a significant lack of social support compared to HCs. The quality of relationships may have particular importance for this client group, as both those with hoarding disorder and OCD report similar absolute numbers of friendships. Individuals with hoarding disorder possibly experience additional needs that impact access to social support, in combination with a general vulnerability to forming less secure relationships. Additional barriers to accessing social support may include negative feelings about the self in the context of clutter, feelings of shame, or the inability to have visitors over due to clutter in the home (Taylor et al., 2019). It is possible that a negative feedback loop exists, whereby social disconnection is heightened due to the build-up of clutter in the home, and reliance on objects for comfort is strengthened in the absence of meaningful relationships with others (Yap & Grisham, 2020). Clutter could then exacerbate further withdrawal from social connection, confirming the perception that people are unreliable, and objects are safer. Due to the cross-sectional nature of the present study, it is not possible to determine the temporal or directional nature of these relationships.

4.3 Clinical Implications

Poor social support was identified as particularly heightened in the hoarding group and may represent a modifiable treatment target. There is some evidence to suggest that higher degrees of social support are associated with improved treatment adherence to CBT interventions in those with hoarding disorder (Weiss et al., 2020). Preliminary findings furthermore suggest that support from non-professionals in the home, as an adjunct to established CBT interventions, improve clinical outcomes in those with clinical hoarding (Crone et al., 2020). Clinicians may endeavour to cooperate with local services to facilitate improved social support for this client group.

Despite the lack of diagnostic specificity, individuals with hoarding did report attachment disruptions and concerns in present-day relationships. These findings have

important implications for the assessment of hoarding, by providing useful information on the potential pathways to the development of emotional attachments to possessions (Mathes et al., 2020). The identification of attachment and relational concerns in this population may also represent factors that influence response to treatment. CBT interventions for hoarding can be emotionally taxing, requiring consistent effort from clients (Ayers et al., 2018). High treatment attrition in CBT interventions for hoarding has been identified as a factor that interferes with treatment gains (Tolin et al., 2015). Alliance focused therapy (AFT) training can improve CBT treatment retention and response for clients who experience attachment-related needs and difficulties in interpersonal relationships (Miller-Bottome et al., 2019; Muran et al., 2018). The AFT model focuses on ruptures in the therapeutic relationship that can activate negative internal working models of the self and other. Positive, nurturing experiences of the therapeutic relationship using AFT principles have been shown to improve positive self- and other-representations and reduce drop-out in CBT (Wiseman & Tishby, 2017). An AFT approach to CBT for hoarding could result in improved treatment adherence and improve feelings of safety and closeness in relationships.

4.4 Limitations

The present study should be considered in light of its limitations. Whilst concentrated efforts were made to recruit from across the UK, the sample was largely white British. This limits the generalisability of these findings to other ethnic or cultural groups. Individuals in this sample were also self-selected. Over half of individuals with hoarding may struggle with insight into the nature and severity of hoarding difficulties (Tolin et al., 2010). Therefore, individuals in this study represent those who recognise hoarding as a significant problem in their lives. It is also possible that the incidence of hoarding disorder may have been over-diagnosed in the present study. Sampling relied on diagnostic interviews that were conducted over the phone, without an assessment of the clutter criterion in the home.

The cross-sectional design of the study is a limitation in determining causality. The study identified factors that are prevalent in the hoarding population but did not attempt to identify causal mechanisms for the development of hoarding. It is not possible to conclude from the current study, therefore, whether problematic interpersonal relationships give rise to hoarding, are a result of hoarding, or interact in a transactional way.

Significant differences in the sociodemographic characteristics between groups limits the current understanding of whether confounding variables account for findings. Due to distribution of data and resultant choice of statistical method, it was not feasible to control for covariates in the analysis. It would therefore be of interest to recruit matched groups in the future to explore the possibility that age or relationship status could contribute to the observed interpersonal difficulties in clinical hoarding.

4.5 Research Implications

The present study generates several questions for future research. A key finding of the study is that social support is significantly poorer in hoarding groups. It is not clear what processes give rise to poor social support in this population or how lack of social support maintains difficulties with hoarding disorder. Interventional research aiming to improve social support may clarify whether improved support can reduce reliance on objects for comfort and safety. It also remains unclear why individuals with hoarding disorder report poorer levels of perceived social support but comparable numbers of close friendships as those with OCD. The field would benefit from an exploration of other factors, such as clutter in the home or negative feelings about the self, that may act as barriers to accessing social support (Taylor et al., 2019).

This study identified that strained relationships, historically and currently, represent nonspecific vulnerability factors associated with hoarding. Less is known about whether these experiences interact with or contribute to emotional attachments to possessions, as a specific

mechanism in the development of hoarding. To overcome limitations of cross-sectional design, and self-report measures relying on participant insight and memory, the field would benefit from longitudinal cohort studies. Cohort studies assessing attachment styles of infants in the strange situation, and following up over time, would clarify the temporal relationship between attachment insecurity and hoarding behaviours (Ainsworth & Bell, 1970).

5 Conclusion

Beliefs associated with possessions as comforting and safe may reflect a lack of emotional connection or safety in relationships with other people (Grisham & Barlow, 2005). This study is the first to assess for diagnostic specificity of attachment and relational issues in hoarding disorder compared to OCD and in HCs. Findings suggest poor bonding with parents in childhood, and anxious and avoidant attachment styles in relationships, are nonspecific but relevant factors associated with hoarding. High incidences of loneliness in current relationships are also relevant, but not specific, to hoarding. Poor social support was identified as particularly elevated in the hoarding group, compared to those in the OCD and HC groups. These results suggest heightened difficulties in historical and current relationships may represent onset or maintenance features in hoarding disorder. Interventions designed to improve interpersonal relationships and social support may represent modifiable treatment targets relevant to this client group. Future longitudinal research is required to explore the direction of the relationship between hoarding and interpersonal needs.

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