

Early Stage Animal Hoarders: Are These Owners of Large Numbers of Adequately Cared for Cats?

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Animal hoarding is a spectrum-based condition in which hoarders are often reported to have had normal and appropriate pet-keeping habits in childhood and early adulthood. Historically, research has focused largely on well-established clinical animal hoarders with little work targeted towards the onset and development of animal hoarding. This study investigated whether a Brazilian population of owners of what might typically be considered an excessive number (20 or more) of cats were more likely to share the commonly reported psychological and demographic profile of animal hoarders than owners of 1-2 cats drawn from the same population. Psychological traits measured were attachment to pets (Lexington Pet Attachment Scale, LAPS), anxiety and depression (Hospitalized Anxiety and Depression Scale, HADS), and hoarding behavior (Saving Inventory-Revised, SI-R). Owners of 20 or more cats were significantly older, scored significantly higher pet attachment scores, and displayed significant positive relationships between hoarding behavior and anxiety. Such a profile demonstrates greater similarities to clinical animal hoarders than to typical cat owners on these particular measures, although additional disparities with clinical animal hoarders exist in the areas of functioning, veterinary care and home organization. Taking this information together, the studied population may represent the understudied group of early stage animal hoarders. However, external factors such as culture and societal animal control policies should not be overlooked as alternative explanations for pet keeping at levels that might be considered excessive.

Keywords: Animal hoarding; cats; human-animal bond; animal collecting; pet attachment

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Introduction

Pet ownership varies from owners who exhibit typical, healthy relationships with one or relatively few animals – where the needs of both owner and animals are met – to highly dysfunctional clinical cases of animal hoarding, where excessive numbers of animals are owned and both animal and human welfare are severely compromised. Such extreme cases are generally characterized by three main features: (1) accumulating an unusually large number of companion animals, (2) inability to provide even minimal standards of nutrition, sanitation, and veterinary care for these animals (neglect can result in starvation, illness, and death), and (3) denial of the negative effects of the animal collection on the health and well-being of owners, their animals, and any other human occupants of the dwelling (Nathanson, 2009; Patronek, 1999; Hoarding of Animal Research Consortium, 2002). Despite such negative conditions, animal hoarders are reported to display excessive attachments to their pets and exhibit severe distress if the animals are removed from their care (Frost & Hartl, 1996; Frost, Patronek, & Rosenfield, 2011; Hoarding of Animals Research Consortium [HARC], 2002; Nathanson, 2009; Steketee, Gibson, Alabiso, Frost, & Arluke, 2011). Although animal hoarding is an extreme form of pet keeping, it is not an uncommon problem. One study has indicated animals may be involved in as many as one-third of compulsive hoarding cases in community-based samples (Frost, Steketee, & Williams, 2000). Furthermore, it is a problem that appears to be increasing in prevalence; analysis of records in one on-line database of animal cruelty cases highlighted a three-fold increase in reports of US animal hoarding incidents from 2009 to 2011 – 111 cases to 336 cases (Animal Abuse Crime Database, 2012). However, as Patronek (1999)

states, the true prevalence is undoubtedly much higher, as it includes all of the undetected cases which are likely to be plentiful due to the owner's reclusive nature, the dismissive response of potential informants (family, friends, neighbors, etc.), and the fact that information often reported is insufficient for case intervention. Nonetheless, reported cases suggest that animal hoarders are often socially isolated, widowed, divorced, or single, older females. Cats appear to be most commonly hoarded, closely followed by dogs (HARC, 2002; Patronek, 1999; Worth & Beck, 1981). Psychological models for animal hoarding include obsessive compulsive disorder (OCD), delusional disorder; belief system out of touch with reality, dementia; lack of insight into the situation, addiction; lack of impulse control, attachment model; early deprivation of parental love and stability, and trauma surrounding early relationships (Frost, et al., 2000; Lockwood, 1994; Nathanson, 2009; Patronek, 1999; Patronek & Nathanson, 2009; Worth & Beck, 1981). Theorists have commonly cited OCD as the favored model to explain animal hoarding, most likely due to its reported association with object hoarding. However, more recently, there has been a growing consensus that animal hoarding differs in several aspects from OCD (HARC, 2012). This is supported by the clinical work of Nathanson (2009) who reports rarely witnessing symptoms of OCD in animal hoarders nor such hoarders being responsive to treatments most frequently applied to people with OCD. Nine years of Nathanson's (2009) casework with animal hoarders suggests that the most common underlying psychological disorders of those who hoard include attachment disorders, addiction, anxiety and dissociative disorder, coupled with complicated or traumatic grief. Other researchers have

reported that anxiety, attachment disorders, and grief appear to be the most frequently cited disorders of animal hoarders (e.g., Steketee et al., 2011; Patronek, 2009).

Between the extremes of pet keeping (healthy and appropriate versus clinical hoarding) are owners of large numbers of animals, often superficially comparable to those witnessed in clinical animal hoarding cases, but residing in apparently adequate conditions. For some people, such as breeders, ownership of this large number of animals may be related to financial income and/or hobby interests. For those who solely keep the animals as pets, reasons are less understood but warrant further scientific investigation as pet ownership of large numbers of animals may cause concern for animal and human welfare. Hoarding is not commonly considered a potential reason for such owners' possession of large numbers, since the animals do not tend to reside in squalor or display symptoms of severe neglect – the conditions considered necessary for clinical animal hoarding (Patronek & HARC, 2001; Snowdon, Shah, & Halliday, 2007). However, clinical animal hoarders are often reported to have had a natural and normal affinity for animals, including appropriate pet-keeping habits in childhood and early adulthood prior to the onset of hoarding (Patronek, 1999; Nathanson, 2009). Such reports support the concept that animal hoarding is not a separate category of pet keeping but instead exists as the extreme end of a pet keeping continuum, which itself moves from mild to severe and pathological hoarding of pets (HARC 2002; Frost & Gross, 1993; Frost, Steketee, Youngren, & Mallya, 1999). However, until recently, research has focused primarily on the well-established severe cases of animal hoarding. This is due to the nature of the method of inclusion/recruitment into most studies,

utilizing case reports provided by animal control and welfare/protection organizations, which have been reported to such bodies due to their nuisance to the public (e.g., Patronek, 1999; Frost et al., 2000; HARC, 2002). Animal hoarding cases in early development stages are therefore difficult to identify and as a result are under-researched and poorly understood.

Investigating ownership of large numbers of apparently cared for animals in normally functioning homes may provide an insight into the development of animal hoarding. It is currently unknown whether such individuals represent the early developmental stages of animal hoarding or a type of pet owner whose pet-keeping style is always defined by large numbers of animals but whose care remains at an acceptable standard throughout the animals' lives. Recently, Steketee et al. (2011) attempted to answer this question by comparing a population of severe animal hoarders with a sample of owners of large numbers of animals who did not meet the criteria for hoarding behavior on a number of areas (potential antecedents, causal factors, and characteristics). Differentiation between the two groups was made on the method of recruitment (through the legal system for animal hoarders and through media advertisements for “animal lovers” for non-hoarders) and through assessment of interference in the home or in personal functioning. To be considered a non-hoarder, there had to be no evidence of interference as evidenced by researcher observations. Despite the qualitative findings highlighting significant differences between the hoarding and non-hoarding populations in terms of attachment, childhood environment, mental health, anthropomorphism, and dysfunctional current relationships, a number of shared common features between the two groups were discovered.

They included experience of stressful life events (both childhood and adult), strong emotional reactions to animal death, strong caretaking roles and attitudes towards animals, tendencies to rescue animals, and intense feelings of closeness or attachment to animals (Steketee et al., 2011). As a result, the authors concluded that their “non-hoarding” population may simply be hoarders who were not yet at a debilitating level and thus not displaying some of the more extreme characteristics displayed by the animal hoarding group (e.g., mental health problems).

However, there is one important omission within this research that makes confidence in such a conclusion difficult; the research lacked a comparison population comprising individuals with normal pet keeping habits (e.g., ownership of only one or two appropriately cared for animals). Including such a group would serve to explore how prominent the shared identified themes are in healthy pet keeping or whether they are defining parameters for hoarding tendencies. Furthermore, the qualitative nature of the research made the magnitude of the common themes difficult to compare. It may be the case that all animal owners on the pet keeping spectrum share the identified characteristics and what defines where one sits on the spectrum is the magnitude to which one displays these characteristics. Thus, distinction of different types of pet keeping from such work is very difficult.

In order to fill this research gap and overcome these methodological problems, the present study used validated psychometric scales for traits previously reported to be associated with animal hoarding (anxiety, depression, hoarding behavior, and attachment) to investigate whether owners of large number of cats were more closely aligned to clinical animal hoarders or more typical cat owners with only one or two cats.

Method

Participants

Two groups of 30 participants were recruited; Group 1 consisted of cat owners of one or two cats, Group 2 consisted of cat owners of 20 or more cats. Since cats have previously been reported as one of the most commonly hoarded species (Patronek, 1999, 2006; Worth & Beck, 1981), owners of such species were selected for the current study. Twenty cats were chosen as a minimum number for Group 2 as such a number is likely to be considered challenging in terms of animal welfare, excessive in terms of pet ownership and represents numbers previously observed in hoarding cases (Patronek, 1999; Steketee et al., 2011).

A selection criterion of only owning one to two cats for Group 1 inclusion was established as such numbers represent what is commonly considered optimum in terms of the care and environmental conditions an owner can provide. A Brazilian population was chosen since the ownership of large numbers of animals, particularly cats, is relatively common, thus allowing appropriate samples sizes to be obtained from a single cultural group. Despite initial attempts to recruit a third comparison group consisting of clinical animal hoarders, it was not possible, as such a population was difficult to identify and the potential individuals who were identified did not wish to consent to the study.

This study was granted approval by the Department of Veterinary Medicine’s Ethics Committees within the University of São Paulo and all participants provided written informed consent. Participants for both groups were recruited through leaflets placed in both the Veterinary Faculty and Veterinary Hospital of the University of São Paulo, Brazil and sent to a local vet clinic specializing in feline medicine. The leaflet simply invited cat owners to take part in a survey examining the human-cat

relationship and to complete a questionnaire. Cat owners voluntarily contacted the researcher by telephone or email and if they met the inclusion criteria, were allocated to the relevant Group (i.e., 1 or 2). At this point, the scales to be used were described to the participants. In addition, some recommended owners of large number of cats who were clients of the specialized feline clinic were contacted by the researcher (NOC) and invited to take part in the study. Recruitment of participants via veterinary services was intentional in order to identify individuals who may represent early-stage animal hoarders and not severe clinical animal hoarders, since the latter do not normally seek veterinary care for their animals. Whenever possible, the researcher (NOC) was present during the completion of the questionnaire in the owners' home. The researcher further verified that cat owners from Group 2 did not appear to be severe hoarders from the appearance of the homes (generally organized and functioning) allowing the hypothesis that they may be early stage animal hoarders to be tested. Participants were given the opportunity to leave the study at any stage without questioning.

All participants were contacted again after completion of the study and given a brief verbal/written report of the main results, an opportunity to ask questions about any of the results, and an opportunity to talk to a psychologist if they wished. At this time permission was sought to publish the results. All data provided in the report was summary data of each group, therefore no individual participants' data could be identified, thus retaining a degree of anonymity. Eventually, all participants also consented to publication of the data.

Data Collection

Three scales which measured features previously shown to be associated with

animal hoarding were utilized. Such features comprised 1) hoarding (acquisition, clutter, and discarding as measured by the Saving Inventory-Revised) (Frost, Steketee, & Grisham, 2004), 2) mental health problems (anxiety and depression) (Jeffreys & Moore, 2008; Frost et al., 2011) as measured by the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983), and 3) pet attachment (Frost & Hartl, 1996; Steketee et al., 2011) as measured by the Lexington Attachment to Pets Scale (Johnson, Garrity, & Stallones, 1992). Such scales were placed together as a single questionnaire and given to participants to complete.

HADS: The Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983)

This scale is composed of fourteen items of which seven are designed to evaluate anxiety (e.g., *I feel tense or "wound up"*) and seven to evaluate depression (e.g., *I still enjoy the things I used to enjoy*). Each item is scored from zero to three (with zero representing no depression and anxiety for that particular item and three representing evidence of depression or anxiety) leading to a maximum possible final score of 21 each for the anxiety and the depression components. A value equal or greater than nine is considered to be clinical (i.e., clinically anxious or clinically depressed). The scale has been translated to Brazilian Portuguese and validated within a Brazilian population (Botega, Bio, Zomignani, Garcia Jr, & Pereira, 1995). In addition to the calculation of individual scores and average scores for each Group on each component (anxiety and depression), the number of participants who scored a score of nine or above in any of the components was calculated separately for each Group.

SI-R – Saving Inventory Revised (Frost et al., 2004)

The inventory was devised to measure object hoarding (Frost et al., 2004) through the measurement of three symptoms of hoarding: clutter, difficulty discarding, and acquisition. Such features have been suggested as being commonplace within animal hoarding cases and are often used in inclusion criteria for diagnoses (Frost et al., 2011; Steketee et al., 2011). Furthermore, previous research has found that a large percentage of people who hoard animals also hoard objects (Frost et al., 2011) and thus it was deemed relevant to explore object hoarding tendencies in the current study. Each of the three factors within the inventory has a number of questions centered around it: clutter (nine items – e.g., *To what extent do you have so many things that your room(s) are cluttered?*), difficulty discarding (seven items – e.g., *How distressing do you find the task of throwing things away?*) and acquisition (7 items – e.g., *How distressed or uncomfortable would you feel if you could not acquire something you wanted?*) each of which can have a score of zero to four, leading to a maximum possible final score of 84 (clutter: 36; difficulty discarding: 24, acquisition: 24). The last two factors have items whose scores are reversed during the calculation of the final score. The inventory has been shown to have good internal consistency and test-retest reliability (Frost et al., 2004), has been translated to Brazilian Portuguese and validated within a Brazilian population (Soares, 2007).

Individual scores on each subscale (clutter, difficulty discarding, and acquisition) and total average scores for each Group were calculated. There are currently no published reference levels for normal versus non-normal scores. Thus, obtained results were compared to those of Frost et al. (2004) who applied the inventory to hoarding patients in comparison to non-hoarding OCD patients and community controls.

LAPS – Lexington Attachment to Pets Scale (Johnson et al., 1992)

The scale measures an owner's attachment levels to their pets and is suitable for use with cat owners (Johnson et al., 1992). Previous work has shown the scale to have excellent psychometric properties, including excellent internal consistency and correlation with several domains of variables known to relate to pet attachment (Johnson et al., 1992). Furthermore, it has been extensively used in a range of human-animal interaction studies, including those involving owner personality, dissociation, and mental health (Bagley & Gonsman, 2005; Brown & Katcher, 2001; Stallones, 1994). The scale comprised of 23 statements relating to strong attachment to pets (e.g., *I believe my pet is my best friend*) and two statements concerning non-attachment (e.g., *I am not very much attached to my pet*) which serve as internal controls. Each item is scored from zero to three, with zero equaling 'disagree completely,' and three equaling 'strongly agree' leading to a maximum possible score of 63. Generally, when the scale is administered, owners are asked to consider their favorite pet and thus the resulting score simply represents their attachment level to this pet. However, the current populations were specifically asked not to focus on any particular cat in order to gain a more representative score of attachment towards all their pets thus preventing bias towards higher scores. There are currently no published reference levels for what would be considered a high- versus a low-attachment level to pets although published studies report average scores for non-clinical populations (Bagley & Gonsman, 2005; Militades & Shearer, 2011).

Statistical Analysis

For the HADS, SI-R and LAPS scores, between-subject t-tests (Mann Whitney U-

tests when data did not meet the assumptions for parametric analysis) were carried out to determine whether there were any significant differences between the two Groups in their scores in anxiety, depression, pet attachment, and hoarding tendencies. Furthermore, the number of people in each Group who were scored as clinically depressed and/or clinically anxious was compared between Groups using Fisher Exact tests to assess whether the distributions found differed from that expected by chance. Spearman's rho correlations were also carried out to investigate the potential relationships between scores on HADS, SI-R, and LAPS for both Groups and between age and the number of cats owned for Group 2 only. All statistical analyses were performed using IBM SPSS, Version 19. An adjusted probability level of 0.01 was used to assess significance to take into account the large number of statistical tests. However, results where $p < 0.05$ were

considered worthy of note as non-significant trends.

Results

Descriptive Characteristics

Differences in demographics and psychological variables between the two cat owning groups are outlined in Table 1. By chance, groups exhibited identical gender distribution (24 females, 6 males in each group), but differed in age; participants owning 20 or more cats were significantly older than those who owned only 1 or 2 cats ($p < 0.001$). While cat owners in Group 1 could only own one or two cats, there was no upper limit on the number of cats owned by a participant in Group 2 (minimum 20). The majority of cat owners (63.3%) in Group 1 (one to two cats) owned two cats while the median number of cats owned in Group 2 was 36 with a range from 20-100 cats within a household.

Table 1

Comparison of Age and Psychological Variables between Owners of 1-2 Cats (Group 1) and Owners of 20 or More Cats (Group 2)

	Group 1 (1-2 cats)		Group 2 (≥20 cats)		P
	Median	Min-Max	Median	Min-Max	
Age (to the nearest year)	27	22-60	53	34-78	<0.001**
HADS – Depression	4.0	0-13	3.0	1-13	0.875
HADS – Anxiety	6.0	1-13	6.0	0-15	0.433
SI-R (total score)	24.0	2-55	22.0	0-58	0.564
Clutter	9.5	0-20	9.0	0-25	0.584
Difficulties discarding	10.5	0-20	6.5	0-22	0.187
Acquisition [†]	8.77	4.58	7.80	4.41	0.408
LAPS	46.5	27-63	56.0	34-63	0.001**

* $p < 0.05$, ** $p < 0.01$ [†]

All values represent median and minimum and maximum values (data not normally distributed) with the exception of the Acquisition sub-score of the SI-R which was normally distributed and therefore mean and standard deviation are reported for this variable only.

Comparison of Clinical Variables

The results of tests of difference between groups for the clinical variables

are outlined in Table 1. Owners of one to two cats did not differ significantly in scores of anxiety ($U = 397.5$, $df = 1$, $p =$

0.433) or depression ($U = 439.5$, $df = 1$, $p = 0.875$) from those who owned 20 or more cats as measured by The Hospital Anxiety and Depression Scale. Four participants in each of the Groups were identified as clinically anxious (i.e., a score of nine or above). Only one participant in Group 1 was identified as clinically depressed, while four were found to be clinically depressed in Group 2. However, such a difference between groups was not statistically significant for clinical anxiety nor depression ($p = 0.100$) nor clinical depression ($p = 0.353$).

Likewise, the two Groups did not differ significantly in their total scores on the Saving Inventory Revised ($U = 411.0$, $df = 1$, $p = 0.564$), nor on the separate components of the inventory; clutter $p = 0.584$, difficulties discarding $p = 0.187$, and acquisition $p = 0.408$.

Comparison of Variables Relating to Pets

Owners of 20 or more cats (Group 2) were significantly more attached to their cats as measured by the Lexington Attachment to Pets Scale (LAPS) than

owners of only one or two cats (Group 1) ($U = 219.0$, $N = 60$, $p < 0.01$).

Relationships between Variables

A summary of the results of the correlation analyses between the variables: HADS; SI-R and LAPS for each Group can be found in Table 2. A near significant negative relationship was found between pet attachment (LAPS) and depression (HADS) for those owning one or two cats, ($r = -0.37$, $p = 0.044$) suggesting that the more attached owners were to their cat(s), the less likely they might be to report depression. Scores of the Saving Inventory Revised were found to have a significant positive relationship of medium strength with anxiety (HADS) for owners of 20 or more cats ($r = 0.63$, $p < 0.001$) but no such relationship was found for owners of one or two cats ($r = 0.18$, $p = 0.355$). In addition, for those owning 20 or more cats, a near significant positive correlation was found between scores on the saving inventory (SI-R) and depression as measured by HADS ($r = 0.40$, $p = 0.029$).

Table 2

Correlation Results between Psychological Measures (SI-R, HADS and LAPS) Within Groups

Group 1 (1-2 cats)	Spearman's rho	P
SI-R and Anxiety	.18	0.355
SI-R and Depression	.07	0.696
SI-R and LAPS	.21	0.278
LAPS and Anxiety	.03	0.860
LAPS and Depression	.37	0.044*
Group 2 (≥ 20 cats)	Spearman's rho	P
SI-R and Anxiety	.63	<0.001**
SI-R and Depression	.40	0.029*
SI-R and LAPS	.09	0.642
LAPS and Anxiety	.22	0.239
LAPS and Depression	.04	0.837
Age and No. of Cats Owned	.01	0.973

* $p < 0.05$, ** $p < 0.01$.

Discussion

For the first time, this study shows that owners of large numbers of cats differ significantly from owners of one or two cats when considering a range of clinical scales related to hoarding. Most importantly, such differences are in a direction similar to those previously demonstrated for clinical animal hoarders. Owners of large numbers of cats were significantly older and more attached to their cats than owners of one or two cats, displayed a significant positive relationship between anxiety and hoarding behavior and a near significant positive relationship between depression and hoarding behavior. Neither of these relationships was witnessed with owners of one to two cats. Taken together, the demographic and psychological findings suggest owners of large numbers of cats may be closer to the end of the pet keeping spectrum that represents animal hoarding than the end that represents appropriate and healthy pet keeping.

Mental Health and Similarity to Clinical Animal Hoarders

Between groups, average scores of hoarding behavior, anxiety and depression did not differ significantly. While no previous studies have utilized the SI-R with animal hoarding populations, current average scores for both groups were substantially below those previously reported for clinical object hoarding populations and comparable to those previously found for non-hoarders (see Frost et al., 2004 for clinical case scores). This is not unexpected if the spectrum theory of hoarding behavior is considered, since hoarders in their early stages of the condition would not be expected to score as highly on the clinical scale as well established hoarders. What is perhaps more interesting is the significant positive relationship between hoarding behavior and anxiety reported in Group 2 (20+ cats)

which is not evidenced in Group 1 (one or two cats). Previously, associations between anxiety and object hoarding have been reported (Jeffreys & Moore, 2008; Frost et al., 2011) but this is the first time to the authors' knowledge that the relationship has been demonstrated in a population of people owning large numbers of cats. The revelation of such a relationship, which is known to be a characteristic displayed in clinical hoarding populations, in Group 2 but not Group 1 is supportive of the hypothesis that such a population may represent those in the early developmental stages of animal hoarding. Additionally, the near significant positive relationship with hoarding behavior and depression further supports this hypothesis.

Age, Gender, and Similarity to Clinical Animal Hoarders

Owners of large numbers of cats were significantly older (average 53 years) than those of one to two cats (average 27 years), exhibiting an age range similar to that commonly described in clinical animal hoarding cases (HARC 2002; Patronek 1999; Patronek & Nathanson, 2009). Animal hoarding has also been proposed to be linked to a number of age-related factors such as loss of social connections due to the death of one's parents or children leaving home (HARC, 2002) and/or age-related neurological changes such as dementia (Patronek, 1999; HARC, 2000). Investigation into such factors within the current sample or future populations of owners of multiple animals would help elucidate whether similar factors influence the older age representation seen in both animal hoarders and this population of owners of large numbers of animals.

Both Groups 1 and 2 contained a higher ratio of females, reflecting previous findings for both normal cat ownership (Adamelli, Marinelli, Normando, & Bono,

2005; Podberscek, Blackshaw & Bodero, 1988; Stambach & Turner, 1999) and animal hoarders (Frost et al., 2011; Steketee et al., 2011). Furthermore, the current study was questionnaire based and previous studies with the same methodology have shown more females taking part in such studies (Pongracz, Miklosi, & Csanyi, 2001).

Pet Attachment and Similarity to Clinical Animal Hoarders

A trend towards a negative relationship was found between reported depression and pet attachment for those owning one or two cats supporting previous findings that healthy attachments to pets can have positive effects on psychological well-being, and may buffer against emotional distress (Garrity, Stallones, Marz, & Johnson, 1989; Keil, 1998; Colby & Sherman, 2002, Turner, Rieger, & Gyax, 2003). Although no published norms for LAPS exist, previous studies of non-clinical pet owning populations reported very similar mean scores to that of the current studied population of pet owners with one to two cats (current study mean LAPS 46.5 in comparison to 42.40 in a group of dog owners (Militades & Shearer, 2011) and 48.4 in a population of pet owners who prefer cats (Bagley & Gonsman, 2005), suggesting the current scores are representative of normal attachment levels. However, what is clear is that despite Group 2 reporting significantly higher attachment scores, these did not correlate with reported depression. Although paradoxical, high levels of attachment do not exclude someone from hoarding animals, as strong attachment has been witnessed to be concomitant with severe denial (HARC, 2002).

A potential hypothesis warranting further study which may help explain this difference in relationship between pet attachment and psychological health between the two groups is that they may

exhibit different attachment styles. Beck and Madresh (2008) have provided initial evidence that attachment scales designed to measure insecurity in human relationships (see Ainsworth, Blehar, Waters & Wall, 1978; Bowlby, 1973, for review of attachment theory) are indeed useful tools for investigating people's relationships with their pets. Such tools involve the measurement of two dimensions: 1) avoidance, which relates to expectations about others as trustworthy and supportive, and 2) anxiety, which relates to the individual's belief about self-worth. Utilizing such a measurement tool, which can discriminate between secure and insecure attachments to pets with both currently studied groups as well as clinical animal hoarders, would provide valuable information for determining the status of pet attachment in owners of large numbers of cats in comparison to clinical animal hoarders and owners of appropriate numbers of cats. By way of caution, though widely used in different cultures (e.g., Adamelli *et al.*, 2005; Duvall, Nikolina, & Pychyl, 2010; Taylor, Williams, & Gray, 2004) it should be noted that the LAPS had not previously been translated into Brazilian Portuguese nor validated within a Brazilian population, and so future work should corroborate these initial findings through validation within a Brazilian population before making further conclusions regarding pet attachment.

Do Owners of Excessive Numbers of Animals Represent the Early Stages of Animal Hoarding?

Given the previous limited information known about the characteristics of populations who own large numbers of animals and whether they hold any relationship to animal hoarders in terms of representing the early stages and/or mild cases of hoarding behavior, the present study is a first step in identifying potential

similarities utilizing recognized measures of clinical importance. While some similarities were found, differences were also identified. Such differences may reflect the simple case that animal hoarding is a syndrome with great heterogeneity (Patronek, 2006) and finding similarities between individuals who are displaying different levels or even different types of hoarding (see Patronek, 2006) may be very difficult. Investigation into other variables previously reported to be associated with animal hoarding could provide further clarification. Such factors include stressful childhood events (inconsistent parenting, chaotic environments, lack of affection from parents and more extreme situations such as abuse, trauma and neglect where animals were the only stable feature for the child) (HARC 2000, 2002; Steketee et al., 2011), factors related to the self (control, self-esteem, identity, significant mental health concerns) (Patronek, Loar, & Nathanson, 2006; Steketee et al., 2011; HARC 2000), and those involving others (dysfunctional current relationships) (Steketee et al., 2011), and failure to accept death (Lockwood & Cassidy 1988). Furthermore, Patronek (2006) has identified three types of hoarders based on differences in how animal hoarders relate to people and animals: the overwhelmed caregiver, the rescuer, and the exploiter. Such types can possibly be distinguished in terms of the pace at which care lapses (Patronek, 2006) and may provide valuable input into identifying and understanding the less severe cases of animal hoarding which to date, have largely been overlooked.

Can Cultural Reasons Explain Large Non-pathological Acquisition of Animals?

It should not be discounted that some owners of large numbers of cats may have so many cats for reasons other than hoarding. This may include a separate

style of pet ownership; one that differs both from that seen in healthy relationships with one or two animals and that in clinical animal hoarding cases. Possible causal factors include those relating to the environment, society or culture. For example, cats are very popular in Brazil with an estimated 18.3 million owned cats (ANFAL Pet Brasil, 2011) among 183 million people (Instituto Brasileiro de Geografia e Estatística, IBGE, 2007). Furthermore, over 230,000 cats reside in the city of San Paulo (location of the current study). According to IBGE (2007), San Paulo has a human population of over 10 million with an estimated 70% of the feline population considered 'partially' owned (i.e., cared for by individuals who do not consider themselves as cat owners (ARCA Brasil, 2008). Due to a shortage of animal re-homing centers, a large number of cats reside on the streets (ARCA Brasil, 2011). As a consequence, those with a sense of compassion for cats and/or animal welfare may have limited options to rehome the cats they encounter on the streets. With the option to enter a re-homing facility greatly reduced in comparison to other countries such as the United Kingdom where a much greater number of rescue and re-homing facilities exist, individuals may be more likely to take the animal home. In some countries, such as the USA and Brazil, many of the cats who do end up in a rehoming facilities are euthanized as a result of overcrowding. Fear of such an end result for a cat may prevent people from taking a stray cat to such a facility and as a consequence they acquire cats in their own personal care at a faster rate than other countries where euthanasia is less common. Several owners in Group 2 in the current study did indeed report to the visiting researcher that they acquired the majority of their cats from the streets as they felt the cats had often been abandoned near their homes. Furthermore,

if many people acquire cats in such a way, it may also become a cultural norm and therefore not be considered inappropriate or inadequate in terms of animal care. However, it is unknown how Group 1 acquired their cats and if they did so in a similar way to Group 2, nor what factors might have prevented Group 1 from acquiring many more. Previous work has shown that a variety of psychological motivations can influence acquisition of cats into the home (Downey & Ellis, 2007) and thus, inclusion of reason for acquisition in future studies would be beneficial. Culture has been shown previously to be influential in pet ownership. For example, in much of the world it is well known that for proper maintenance of health, dogs need to be exercised and owners will regularly do so. However, a study investigating older Latin adults found that despite appearing to be very devoted to their pets, having been involved with pets since childhood, and viewing themselves as healthy, they did not necessarily exercise their dogs (Johnson & Meadows, 2002). The phenomenon of animal hoarding and ownership of large numbers of animals is a complex, multi-faceted area requiring more multi-disciplinary empirical research. Furthermore, the value of owners of large numbers of animals as appropriate control populations in future studies needs careful consideration due to the possibility that they may exist on a hoarding continuum.

Acknowledgements

We would like to thank Professor Daniel S. Mills for reading and offering suggestions on drafts of the manuscript.

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