

Keeping Pets (Dogs and Cats) in Homes:  
A Three-Phase Retention Study

*Phase II: Descriptive Study of Post-Adoption Retention  
in Six Shelters in Three U.S. Cities*



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Funding for Phase II provided by PetSmart Charities, Inc.



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## Introduction

Every year, 5 to 8 million homeless pets are cared for by our nation's shelters, with a staggering 3 to 4 million of those pets euthanized<sup>1</sup>, even though the overwhelming majority of them are considered to be healthy and adoptable. In 2012 American Humane Association's Animal Welfare Research Institute embarked on a multi-phase study to better understand what is preventing people from adopting these animals and, more importantly, to learn the most effective strategies to ensure that newly adopted pets *stay* with their families, preventing relinquishment to shelters.

Post-adoption return-to-shelter rates for dogs and cats have been reported to be between 7 percent and 20 percent for the first six months following adoption<sup>2,3</sup>. These numbers do not include pets who were lost, died, or were given away instead of being returned to the shelter. Thus, there could be several hundred thousand to more than a million cats and dogs obtained from shelters in the United States who exit homes prematurely each year. This ongoing cycle of pet homelessness depletes already limited shelter resources when animals are returned, negatively affects industries and professions that serve our nation's pets, adversely affects the human-animal bond among families and children, and puts a multitude of pets at risk for euthanasia.

With generous support from PetSmart Charities, Inc., American Humane Association's Animal Welfare Research Institute completed the second phase of an effort to better understand what happens to pets after they are adopted. The goals of Phase II of the study, *Keeping Pets (Dogs and Cats) in Homes: A Three-Phase Retention Study*, were to:

- 1) Determine the number of dogs and cats remaining in their homes approximately six months following adoption from six animal shelter facilities
- 2) Determine the disposition of pets no longer remaining in homes
- 3) Examine factors associated with non-retention, and
- 4) Identify factors to be considered in devising potential intervention strategies for the third and final phase of this study

Though many shelters encourage adopted pets to be returned if the match does not work, adopters may choose avenues other than return to the shelter if they give up the new pet; thus the actual number of pets remaining in their homes six months after adoption is likely less than what is reported by animal shelters. If the majority of adopted pets who are not retained exit their new homes within the first six months following adoption as previously reported<sup>4</sup>, then the time immediately following adoption may offer a unique window for targeting intervention.

For more than 136 years, American Humane Association has succeeded in protecting America's children, pets, farm animals, and animal actors from cruelty, abuse, and neglect. Everything the organization does is rooted in science so that our actions, policies, and outreach may do the most good. In this ever-changing world, new threats to our most vulnerable constantly emerge, reinforcing the need for constant evaluation to protect our most precious treasures. Through projects such as this, American Humane Association and our Animal Welfare Research Institute hope to advance our knowledge of the challenges facing the wellness, welfare, and well-being of the creatures around us and to strengthen the remarkable physical and emotional bond between human beings and the animals that share and enrich our world.



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<sup>1</sup>American Humane Association Fact Sheet, 2013 (a wide range is given by national organizations on the number of dogs and cats entering shelters and the number of animals euthanized – hence efforts in 2012 by several groups to develop a national database for U.S. shelters).

<sup>2</sup>Kidd AH, Kidd RM and George CC, Successful and unsuccessful pet adoptions, *Psychological Reports*, 70, 547-561, 1992.

<sup>3</sup>Personal communications with executive directors reveal lower return-to-shelter rates than what is published in literature.

<sup>4</sup>New JC, Salman MD, King M, et al. (2000) Characteristics of Shelter-Relinquished Animals and Their Owners Compared with Animals and Their Owners in U.S. Pet-Owning Households, *Journal of Applied Animal Welfare Research Science*, 3(3), 179-201.

# Overview

## Research Purpose:

Phase I of the *Keeping Pets (Dogs and Cats) in Homes: A Three-Phase Retention Study* was structured to discern the reasons why many Americans do not have a dog or cat in their homes. An online survey was created and administered to 1,500 respondents in February 2012, with the results published in May 2012.

Phase II investigated pet retention in a sample of animal shelters six months following adoption and examined factors associated with non-retention. Phase II was completed in October 2012.

Phase III is being planned to assemble an expert panel to review material from the literature and results from Phases I and II to evaluate the key issues, and design a trial to test practical intervention strategies for improving retention rates following the acquisition of adopted pets.

*“The time immediately following adoption may offer a unique window for targeting intervention.”*

## Objectives of Phase II:

- Survey pet owners six months following acquisition of a dog or cat from one private shelter and one animal control agency in each of three selected U.S. cities
- Determine what percent of adopted pets remained in the home
- Identify outcomes for pets no longer in the home
- Identify reason(s) why pets were relinquished
- Explore differences in retention of dogs/cats based on owner demographics
- Explore differences in retention of dogs/cats based on owner expectations and attitudes
- Explore differences in retention of dogs/cats based on pet demographics and dispositions
- Explore differences in retention of dogs/cats based on post-adoption events
- Provide baseline information to measure the success of interventions tested in Phase III of the study

## Definitions

Various terms (relinquished, surrendered, non-retained, returned) have all been used in the literature to discuss pets who exit homes prematurely following acquisition. In our results, we differentiated dogs and cats who returned to a shelter versus those who had a different disposition. The term “*shelter*” refers to both animal care and control facilities that are either publicly or privately funded (e.g., animal control agencies versus humane societies/SPCAs). In our research, the term “*pet*” refers to either a dog or cat.



## Summary of Phase II Findings

*“Overall, we found that more than one out of every 10 pets was no longer in the home six months after adoption.”*

In Phase II of *Keeping Pets (Dogs and Cats) in Homes: A Three-Phase Retention Study*, surveys were obtained from 572 adopters of dogs and cats from six animal shelters in three cities across the United States (Charlotte, N.C.; Denver, Colo.; and Forth Worth, Texas) [Table 1]. Animals were adopted approximately six months prior to the survey. The key goals were to explore whether pets were retained and, if not, the fates of those no longer in their adoptive homes. Owner, pet, and household demographics, as well as owner attitudes and behaviors, and owner-reported pet behaviors were surveyed to provide descriptive information and analyzed to identify factors associated with non-retention [Tables 2-8].

Overall, we found that more than one out of every 10 pets was no longer in the home six months after adoption. Half of the pets no longer in the home were returned to the shelters of acquisition and half had other outcomes (given to another person, lost, or died). Retention rates ranged from 87 percent to 93 percent across the six study shelters, with no overall differences in retention rates by state, type of shelter, or shelter services. There were no differences in retention rates between dogs or cats, or between male or female pets. However, participation rates were 60 percent and 53 percent in two cities and considerably less in the third city (33%). It is not known if there may be differences between adopters who volunteered to participate in the study and those who did not.

There was a significant difference in retention rates associated with veterinary visits. The retention rate among pets that had had a veterinary visit was 93.3 percent, with no difference between dogs and cats. However, among the relatively small number of pets who had not seen a veterinarian (30 dogs and 63 cats), only 53.3 percent of dogs compared to 79.4 percent of cats were retained [Table 7b], and 92.9 percent of non-retained dogs and 61.5 percent of non-retained cats had left their homes within two months of adoption [Table 7c]. Most pets (83.2%) had seen a veterinarian [Table 4]. Overall, dogs were slightly more likely to have had a veterinary visit (89%) compared to cats (77.5%). For both species, retained pets were more likely to have had a veterinary visit compared to non-retained pets. There was no overall increase in the likelihood that a pet would have had a veterinary visit whether or not their owners had been offered a free exam. Although these data suggest a beneficial effect associated with visiting the veterinarian (i.e., animals who went to the veterinarian were more likely to be retained), we should be cautious. It is difficult to discern from these data whether there was some beneficial impact associated with veterinary visits or if, in fact, some owners chose not to visit a veterinarian until they were sure they would keep the pet.

Owners aged 25-34 had the highest percentage of retention of their adopted pets of any age group, followed closely by those aged 45-54 [Table 3].

Surprisingly, there was no difference in retention amongst owners who had done much research on a pet before adopting and got what they wanted, and those who made a spur-of-the-moment decision [Table 4].

Owners who sought advice and support about the pet from family, friends, or a veterinarian following adoption were three times more likely to retain their pets than those who sought no advice. Conversely, those who sought advice from shelters were about half as likely to retain their pets. One possible explanation for the phenomena is that owners

will seek counsel from different sources depending upon the degree of difficulty they are having, and owners having more problems with their pets may be more likely to seek help from the adoptive shelter or as a last resort prior to returning the animal to the originating shelter.

There was no difference in retention between first-time pet owners and those with prior pet experience.

Interestingly, owners reporting that their pets took between two weeks and two months to adjust to their home were more likely to retain their pets than those who reported that their pets took less than two weeks to adjust or those who reported that their pets never did adjust to the home [Table 4]. Clearly factors other than a pet's adjustment were involved in whether or not they were retained.

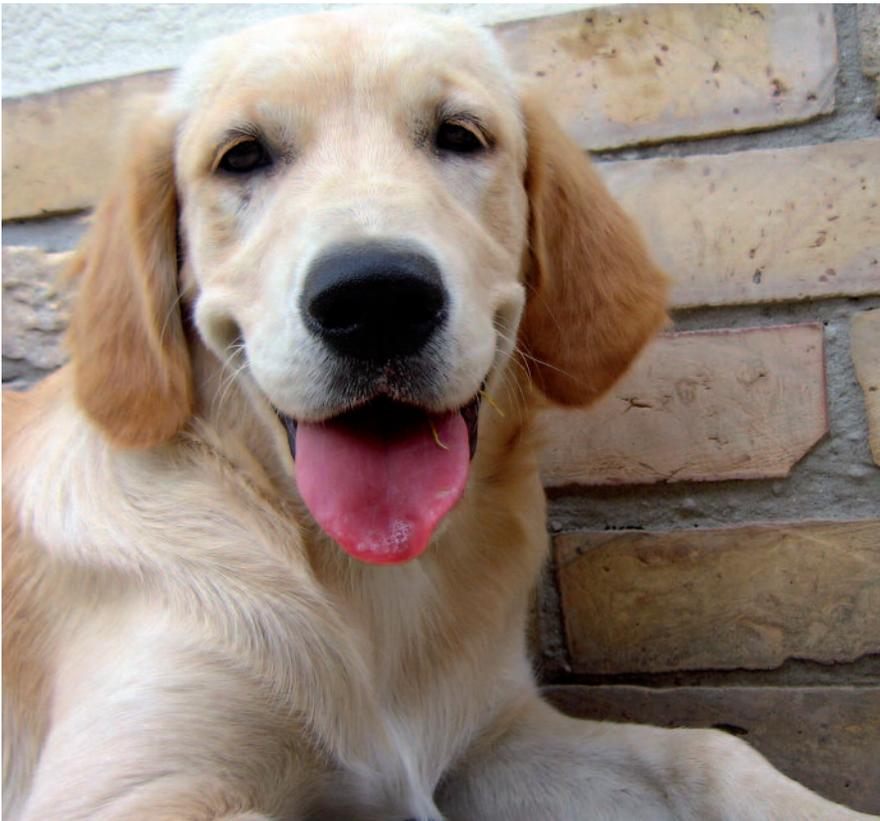
*“There was no overall increase in the likelihood that a pet would have had a veterinary visit whether or not owners had been offered a free exam.”*

Pets who slept on a family member's bed were more likely to be retained than pets who slept elsewhere in the house (pet bed, floor, crate, furniture).

When owners ranked various concerns (e.g., cost, time commitment, health issues, behavioral issues) as high, pets were less likely to be retained than when such concerns were ranked lower or not present [Table 8].

Retention of a pet was higher for college graduates and lower for those living in a small town.

Unfortunately, for certain household demographics, owners who did not retain pets were significantly more likely to refuse to answer some questions. Though the refusal rate of any question was never more than 7 percent of those who did not retain their pets, thus extrapolation of the findings should be done cautiously.



The findings from the participants in this study indicate that, nationally, hundreds of thousands (some one in 10) of adopted animals are no longer in the home six months post-adoption. Furthermore, the rates in this study may represent a “best-case scenario,” especially if non-participants and non-respondents are less likely to retain their pets than those who volunteered information. Despite the laudable efforts of shelters across the nation, given adoption numbers in the United States, even the rates in this study would suggest that a large number of adopted pets are not retained more than six months. Given the limitations of this study, although not atypical of the challenges of shelter research, in general, it is possible that retention of pets in the home six months post-adoption may not be as high as indicated here, and non-compliance should be an important consideration in the design of future studies.

# Background and Literature Review

In 1974 and 1976 the National Conferences on Dog and Cat Control were held in Denver, Colo., to address the topic of pet overpopulation in the United States<sup>5</sup>. These conferences were the combined effort of American Humane Association, the American Kennel Club, the American Veterinary Medical Association, the Humane Society of the United States, and the Pet Food Alliance, and were held at a time when animal shelters were overrun with litters of abandoned puppies and kittens<sup>5</sup>. In the years following the conferences, the sheltering community's primary method for lowering abandonment and euthanasia was curbing reproduction through national low-cost spay/neuter campaigns, and the slogan "LES is More," an acronym for Legislation, Education, and Sterilization, evolved as the cornerstone of the campaign against overpopulation<sup>6</sup>.

In 1992, pet overpopulation in the U.S. was again addressed with leaders of national humane organizations and breed registries, veterinary professionals, and epidemiologists. As a result, the National Council on Pet Population Study and Policy (NCPSP) was launched. Ten organizations funded the two largest national research studies to date that examined pet owner characteristics and demographics and investigated characteristics and reasons for relinquishment of dogs and cats<sup>7</sup>. A multitude of meaningful findings came from the studies and have served as predominant sources of evidence informing the companion animal welfare community that are still widely cited today. In 1990, the number of dogs and cats estimated to be euthanized annually at U.S. shelters was between 11.1 and 18.6 million<sup>8</sup>. The NCPSP has been credited with providing information that led to successful intervention strategies for retaining pets in homes (e.g., behavioral training classes in many pet stores and veterinary clinics) and reducing national euthanasia rates. Twenty years have passed since the initiation of the NCPSP studies, and the sheltering community is eager to learn about the current dynamics of the unwanted pet population and the characteristics of adoption and retention in the U.S. today. Although the number of pets euthanized each year in U.S. shelters is now considered far lower (3 to 4 million) than numbers reported in 1990, a civilized nation that cares about its pets seeks to have the number as low as possible.

*“Although the number of pets euthanized each year in U.S. shelters today is considered far lower... than numbers reported in 1990, a civilized nation that cares about its pets seeks to have the number as low as possible.”*

Precise national estimations of unwanted, euthanized, and adopted pets are difficult to determine because of variable reporting methodologies between shelters, the absence of a centralized database, and differences in definitions of terms such as *euthanasia* and *homelessness*<sup>9</sup>. Mandatory spay/neuter laws at the local and state level across the country have yielded mixed results in decreasing homeless pet populations<sup>10</sup>. Local and regional low-cost, high-volume spay/neuter programs have also accomplished varying degrees of success around the country, with shelters in Asheville, N.C., and Jacksonville, Fla., reporting significant declines in euthanasia rates<sup>11</sup>, and experts in Austin, Texas, reporting far less impact than anticipated<sup>12</sup>.

<sup>5</sup>Proceedings of the National Conference on Dog and Cat Control. (1976). Denver, Colo.: American Humane Association.

<sup>6</sup>Rowan, A. N., & Williams, J. (1987). The success of companion animal management programs: A review. *Anthrozoos: A Multidisciplinary Journal of the Interactions of People & Animals*, 1(2), 110-122.

<sup>7</sup>[www.petpopulation.org](http://www.petpopulation.org). Retrieved January 12, 2013.

<sup>8</sup>Animal Shelter Reporting Study, 1990, American Humane Association.

<sup>9</sup>Kass, P. H. (2007). Cat overpopulation in the United States. In: I. Rochlitz (ed). *The Welfare of Cats*, 119-139. Netherlands.

<sup>10</sup>Coppola, R. (2010). Communities as Shelters: Examining America's Pet Overpopulation Crisis, Controversy and Solutions, Part One: Starting a Dialogue. American Humane Association.

<sup>11</sup>[http://www.hsvma.org/case\\_for\\_low\\_cost\\_high\\_quality\\_high\\_volume\\_spay\\_neuter\\_081111#.UOIjlonjW4](http://www.hsvma.org/case_for_low_cost_high_quality_high_volume_spay_neuter_081111#.UOIjlonjW4). Retrieved December 31, 2012.

<sup>12</sup>[http://www.maddiesfund.org/Maddies\\_Institute/Articles/Using\\_Data\\_to\\_Make\\_Austin\\_a\\_No\\_Kill\\_City.html](http://www.maddiesfund.org/Maddies_Institute/Articles/Using_Data_to_Make_Austin_a_No_Kill_City.html). Retrieved December 31, 2012.

*“Animal welfare organizations recognize that pet homelessness is a multidimensional problem and is a combined result of too many births of unwanted pets, insufficient or misdirected resources to care for both wanted and unwanted pets in many communities, and too many pets not remaining in homes.”*



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### **Relinquishment of Owned Pets (acquired from any source):**

#### *Relinquishment in the early months of pet ownership*

Considerable information has been reported on predictive factors for relinquishment. In 1987, Arkow reported on 918 people relinquishing pets to one of 13 U.S. shelters<sup>13</sup>. Forty-two percent had owned their pets less than six months, and 22 percent owned dogs and/or cats from six to 12 months. In 1992, Kidd et al. reported that within six months of adoption, 20 percent of 343 adopters had rejected their new pets<sup>2</sup>. In 2000, New et al. reported on survey information representing 2,631 dogs and 2,374 cats relinquished to 12 U.S. shelters. The length of ownership was less than three months for 21.8 percent of dogs and 15 percent of cats at the time of relinquishment. The length of ownership was less than six months for 31.9 percent of the dogs and 25.9 percent of the cats<sup>4</sup>. Thus, it appears that new pets have been at highest risk for relinquishment in the first few months following acquisition.

#### *Owner and household characteristics*

Characteristics of pet owners have appeared to play a role in relinquishment risk. Kidd et al. found that first-time owners were more at risk than experienced owners<sup>2</sup>. In two studies, men were reported to be at higher risk for relinquishing than women<sup>2,4</sup>. Another study, however, found women to be slightly more at risk than men<sup>14</sup>. It is important to note that the person relinquishing the dog or cat may not have been the family member making the decision to relinquish and also may not have been the original adopter of the pet.

New et al. reported that people who relinquished dogs were more likely to be under 50 years of age, and those who relinquished cats were more likely to be under 35. Those with lower educational levels were more likely to relinquish than those with education beyond high school<sup>4</sup>. A larger family size was reported to be positively associated with pet disobedience<sup>15, 16, 17</sup> and unfriendliness and aggressiveness in dogs<sup>15</sup>. Kubinyi et al. similarly reported that the number of people in a household was positively correlated with aggression in dogs and the strongest predictor of disobedient behaviors in dogs was whether owners had engaged in a formal training class with their dogs. Although participation in formal training decreased the occurrence of problematic behaviors<sup>17</sup>, only about 25 percent of dog owners in the U.S. participated in formal training classes as of 1999<sup>18</sup>.

<sup>13</sup>Arkow P. (1987). The shelter's role in the bond. In: P. Arkow (ed). *The Loving Bond: Companion animals in the helping profession*. pp 287-303. Saratoga, CA. R&E Publishing.

<sup>14</sup>Scarlett JM, Salman MD, New JG et al. (1999). Reasons for relinquishment of companion animals to U.S. animal shelters: selected health and personal issues. *Journal of Applied Animal Welfare Science*, 2(1), 41-57.

<sup>15</sup>Bennett, P. C., & Rohlf, V. I. (2007). Owner-companion dog interactions: Relationships between demographic variables, potentially problematic behaviours, training engagement and shared activities. *Applied Animal Behaviour Science*, 102(1), 65-84.

<sup>16</sup>Kidd, A. H., & Kidd, R. M. (1989). Factors in Adults' Attitudes Toward Pets. *Psychological Reports*, 65(3), 903-910.

<sup>17</sup>Kubinyi, E., Turcsán, B., & Miklósi, Á. (2009). Dog and owner demographic characteristics and dog personality trait associations. *Behavioural Processes*, 81(3), 392-401.

<sup>18</sup>Coren, S., (1999). Psychology applied to animal training. In: Stec, A.M., Bernstein, D.A. (Eds.), *Psychology: Fields of Application*. Houghton Mifflin, Boston, pp. 199-217.

*“Phase I of the Keeping Pets (Dogs and Cats) in Homes study found adults were more likely to bring a dog into their home if they had a dog as a childhood pet, however exposure to a feline pet as a child did not equate to likelihood of cat ownership as an adult<sup>1</sup>.”*



From previous reports, the most important variables associated with relinquishment of dogs were the owner not participating in dog obedience classes after acquiring the dog, lack of veterinary care, inappropriate care expectations on the part of the owner, the dog remaining sexually intact, inappropriate elimination, acquisition for little or no cost, dogs being older than six months when obtained, and dogs spending most of the day in a yard or crate<sup>19,20</sup>.

Salman et al. found that owners from households with dogs were less likely to relinquish for behavioral reasons (versus non-behavioral and mixed reasons) when no other animals were present in the household. Whether a dog or cat had been added to the household in the year preceding the study was significantly associated with what type of relinquishment reason was given for both dogs and cats<sup>21</sup>.

Shore et al. conducted telephone interviews with 57 people who had relinquished pets to a shelter because they and/or their families were moving, and found that landlord restrictions were an important factor in relinquishment and that large-breed dogs were reported to be less welcome in rental units<sup>22</sup>.

Adults who owned pets (species not indicated) as children or adolescents were reported by Kidd and Kidd to be more likely to have significantly higher attachment levels to their pets in adulthood than those who either never owned an animal or who first owned them as adults<sup>16</sup>. Phase I of the *Keeping Pets (Dogs and Cats) in Homes* study found adults were more likely to bring a dog into their home if they had a dog as a childhood pet, however exposure to a feline pet as a child did not equate to likelihood of cat ownership as an adult<sup>1</sup>. Kobelt et al. reported that first-time dog owners generally spent less time with their dogs and were more likely to report problem behaviors such as excitement and nervousness in their dogs<sup>23</sup>. Kidd et al. also reported that those who owned a pet in childhood, single adults, and parents with realistic expectations about what a pet could teach their children were less likely to relinquish a pet than those who had not owned a pet before, were married or thought the pet could keep their children busy or teach them to love<sup>2</sup>. Patronek et al. found that those who believed that a dog was a family member were less likely to relinquish<sup>19</sup>.

#### *Pet behavioral issues*

Dogs with behavioral issues<sup>19,24</sup> and little veterinary care<sup>19</sup> have been found to be at greatest risk for relinquishment. Of 71 reasons for relinquishment given by owners in a study conducted on behalf of the NCPPSP by Salman et al., 33.8 percent were classified as behavioral<sup>21</sup>. House soiling was a common reason for relinquishment for both dogs and cats. When a single behavior was given, biting, aggression, and escaping were the top three behaviors cited by relinquishing owners of dogs. For cats with single behaviors given, housing soiling, issues with other pets, and aggression toward people were listed among

<sup>19</sup>Patronek GJ, Glickman LT, Beck AM et al., (1996). Risk factors for relinquishment of dogs to an animal shelter. *Journal of the American Veterinary Medical Association* 209(3), 572-581.

<sup>20</sup>Salman, M.D., New Jr, J. G., Scarlett, J. M., Kass, P. H., Ruch-Gallie, R., & Hetts, S. (1998). Human and animal factors related to relinquishment of dogs and cats in 12 selected animal shelters in the United States. *Journal of Applied Animal Welfare Science*, 1(3), 207-226.

<sup>21</sup>Salman, M. D., Hutchison, J., Ruch-Gallie, R., Kogan, L., John Jr, C., Kass, P. H., & Scarlett, J. M. (2000). Behavioral reasons for relinquishment of dogs and cats to 12 shelters. *Journal of Applied Animal Welfare Science*, 3(2), 93-106.

<sup>22</sup>Shore, E. R., Petersen, C. L., & Douglas, D. K. (2003). Moving as a reason for pet relinquishment: A closer look. *Journal of Applied Animal Welfare Science*, 6(1), 39-52.

<sup>23</sup>Kobelt, A., Hemsworth, P., Barnett, J., & Coleman, G. (2003). A survey of dog ownership in suburban Australia—conditions and behaviour problems. *Applied Animal Behaviour Science*, 82(2), 137-148.

<sup>24</sup>Diesel, G., Pfeiffer, D., & Brodbelt, D. (2008). Factors affecting the success of rehoming dogs in the UK during 2005. *Preventive Veterinary Medicine*, 84(3), 228-241.

the top three undesirable behaviors. New et al. reported that owners of problem-behavior dogs typically owned those dogs for less than three months before surrendering them to shelters, and so the window in which help or guidance might be provided is seemingly narrow<sup>4</sup>.



In 2008, Lord et al. surveyed over 2,500 adopters one week following acquisition of a pet and found that 50.6 percent of the individuals who had adopted a dog or cat reported that the pets had a behavioral problem<sup>25</sup>. Fifty-one percent of the pets had one or more health issues. At one month following adoption, most participants still had their new pets at the time of the survey (98.3%). However, 10.3 percent of these adopted pets still had unresolved health issues, and 51.2 percent had unresolved behavioral issues. Owners with cats reported fewer behavioral issues than those with dogs (66.4% of those with more than one behavioral issue were dogs). The most common behavioral issues reported for dogs were chewing, digging, or scratching objects. The most common behavioral issues for cats were chewing, digging, scratching, or high energy level. For both dogs and cats, pets less than one year of age were most likely to have behavioral issues reported<sup>25</sup>. A 2010 study by Shore and Girrens found that 55 percent of recent dog adopters experienced behavioral problems within the first six months, but 35 percent continued to have problems after six months, most of which were minor<sup>26</sup>. Because the most important factors relating to risk for relinquishment for dogs are modifiable, addressing these issues early could potentially increase likelihood of retention<sup>19</sup>. Adding to the complexity of understanding ‘behavior’ as a factor influencing retention is the fact that it is the owner’s perception of the problem that is likely key, and that is influenced by their expectations of a pet and their understanding of what constitutes the range of normal behaviors in a species or breed.

#### *Pet demographic characteristics*

Scarlett et al. found that the risk for relinquishing a dog for behavioral reasons increased after nine months of age (perhaps resulting from dogs going through adolescence) but decreased after six years of age<sup>14</sup>. Such an increase was not observed for cats. New et al. noted that the risk for relinquishment of cats and dogs seemed to lessen with age<sup>4</sup>. New et al. also found that surrendered cats and dogs were significantly younger than those kept as pets in the home and that mixed-breed pets were more likely to be relinquished than purebreds. Dogs who came from an animal shelter, friend, or pet shop, or who had been a stray were more likely to be relinquished than dogs acquired as gifts. The risk for relinquishment decreased with length of ownership, over one year for dogs and over two years for cats. Dogs acquired for less than \$100 were at increased risk for relinquishment, but no such association was present in cats (however very few cats in the study were acquired for more than \$100). Dogs with a history of biting a person were at higher risk for relinquishment, but this was not the case for cats<sup>4</sup>.

Patronek et al. also reported that younger dogs were at greatest risk for relinquishment, also due to undesired behaviors<sup>19</sup>. Adoptive owners, who might have been at risk for relinquishing their pets, reported a desire to obtain advice about canine behavior. Undesirable canine behaviors cited by Patronek’s research included unwanted barking and chewing, hyperactivity, inappropriate elimination, aggression toward other pets, or

<sup>25</sup>Lord LK, Reider L, Herron ME et al. (2008). Health and behavioral problems in dogs and cats one week and one month after adoption from animal shelters. *Journal of the American Veterinary Medical Association*, 233(11), 1715-1722.

<sup>26</sup>Shore, ER and Girrens, K. (2010). Characteristics of animals entering an animal control or humane society shelter in a Midwestern city. *Journal of Applied Animal Welfare Science*, 4(2), 105-115.

<sup>27</sup>Duxbury, M. M., Jackson, J. A., Line, S. W., & Anderson, R. K. (2003). Evaluation of association between retention in the home and attendance at puppy socialization classes. *Journal of the American Veterinary Medical Association*, 223(1), 61-66.

*“The factors that contribute to successful and unsuccessful shelter pet adoptions are complex, and understanding them can help organizations evaluate the nature and success of adoptions in their communities and implement strategies to increase adoption retention.”*

aggression toward people. Duxbury et al. studied the relationship between retention of adopted puppies and participation in puppy socialization classes and found that puppies who slept on or near their owners’ beds were more likely to be retained<sup>27</sup>.

Salman et al. reported that cats who were sexually intact, allowed outdoors, had never received veterinary care, frequently soiled in the home, were more work for their owners than expected, or had owners with specific expectations about what role the cats would play in the family were at higher risk for relinquishment<sup>20</sup>. Health concerns such as allergies or illness, personal problems, the addition of a new baby, moving, or not having enough time for the pet have been the most commonly cited reasons for cat relinquishment<sup>20,28</sup>. Patronek et al. also found that cats allowed to roam outdoors, confined to basements or garages for parts of the day, or never taken to a veterinarian were also at an increased risk for relinquishment<sup>29</sup>.

#### *Retention of Adopted Pets – Additional Information*

Diesel et al. reported in 2008 that 14.7 percent of dogs adopted from shelters in the United Kingdom were returned to the shelter of origin within six months, 39.1 percent of whom were returned within two weeks of adoption<sup>24</sup>. They also found that the shelter from which a dog was adopted, owner expectations prior to adoption, where a dog slept at night, whether owners sought council for dogs who showed aggression, and participation in training classes all had meaningful impacts on adoption retention. When Kidd et al. obtained George Pet Expectations Inventory scores from 343 San Francisco area adopters in 1992, it was possible to predict pet retention or rejection with 72 percent accuracy. The prediction rate was increased to 86 percent when an adopter’s age, gender, marital status, parenting status, and history of previous pet ownership were also considered<sup>2</sup>.

Elsie Shore investigated the circumstances around return of a recently adopted cat or dog and the relinquishers’ reactions to their adoption and return experience, focusing in particular on changed perceptions of the role of companion animals in the adopters’ lives and the species of animals who might be well-suited to their needs<sup>30</sup>. At the point of relinquishment, when owners were asked whether they intended to adopt another pet in the future, 44 percent said “yes.” As difficult as the decision to relinquish a pet has been shown to be<sup>31</sup>, adopters who came to this decision seemed willing to give another homeless pet a home in the future. Fifty-six percent of owners returning adopted pets rated the difficulty of doing so a 10 out of 10 (on a scale from 1 to 10, 10 being *very difficult*). Many relinquishing a pet intended to devote more consideration and planning to adoption in the future<sup>30</sup>.

The factors that contribute to successful and unsuccessful shelter pet adoptions are complex, and understanding them can help organizations evaluate the nature and success of adoptions in their communities and implement strategies to increase adoption retention. However, given the complexity of the situation and relationships, it may be unlikely that there is one “silver bullet” intervention that is likely to markedly increase retention. For

<sup>28</sup>Miller, D.D., Staats, S.R., Partlo, C. and Rada, K. (1996) Factors associated with the decision to surrender a pet to an animal shelter. *Journal of the American Veterinary Medical Association*, 209,738-742.

<sup>29</sup>Patronek, G.J., Glickman, L.T., Beck, A.M., McCabe, G.P. and Ecker, C. (1996) Risk factors for relinquishment of cats to an animal shelter. *Journal of the American Veterinary Medical Association*, 209, 582-588.

<sup>30</sup>Shore, E. R. (2005). Returning a recently adopted companion animal: Adopters’ reasons for and reactions to the failed adoption experience. *Journal of Applied Animal Welfare Science*, 8(3), 187-198.

<sup>31</sup>DiGiacomo, N., Arluke, A., & Patronek, G. (1998). Surrendering pets to shelters: The relinquisher’s perspective. *Anthrozoos: A Multidisciplinary Journal of the Interactions of People & Animals*, 11(1), 41-51.

example, more research exists on the relationship between dogs and their owners than cats and their owners, which may hamper the ability to address cat relinquishment through a rational approach. Just as patients entering a hospital are not all treated similarly, it is highly unlikely that one approach will be successful in addressing relinquishment of all pets. See Table 9 for a summary of factors associated with non-retention from the literature review.

### **Pet Ownership and Retention Outside the U.S.:**

Outside of the United States, there is considerable variation in the management of unwanted companion animals. In 2009 the World Society for the Protection of Animals and the Royal Society for the Prevention of Cruelty to Animals International commissioned a study led by Louise Tasker of 34 animal welfare groups from 30 countries throughout Europe and Eurasia to better understand stray population dynamics and methods of control of unwanted pets in the region<sup>32</sup>. The surveyed groups reported a perceived correlation between requirement and enforcement of pet registration and licensing and regions with low numbers of unwanted pets. The researchers suggested that education in responsible pet ownership also played a substantial role in communities with small stray populations.

Sweden has been commonly cited for its small stray population despite a much lower number of dogs and relatively lower number of cats neutered in Scandinavian countries than the U.S. Tasker noted that approximately 90 percent of companion animals in Sweden have been obtained from breeders and were typically an expensive acquisition, meaning pet ownership has been associated with a sizeable financial investment. There has been high public compliance with registration and licensing laws, as well as leash laws, and cultural attitudes have held responsible pet ownership in high regard. At the time of Tasker's study in 2007, 90 percent of pets that entered shelters in Sweden were returned to their owners within 24 hours, and almost all who were not found adoptive homes<sup>32</sup>. Lessons from Sweden's success in managing its pet population may help inform adoption intervention strategies around adopter education, pet licensing, humane education programs, and community outreach; however, substantial cultural and social differences across countries are not easily changed.

### **Barriers to Adoption:**

In 2012, the American Pet Products Association (APPA) reported that the total number of cats in U.S. households had decreased from 92 million to 86.4 million<sup>33</sup>. This downward trend was noted for the first time by APPA. In August 2012, the American Veterinary Medical Association (AVMA) reported that U.S. households owned 1.9 percent fewer dogs and 6.2 percent fewer cats in 2011 than in 2006<sup>34</sup>. According to AVMA, this equated to 2 million fewer dogs and 7.6 million fewer cats at the end of a five-year period. These two surveys sent alarms to both the pet industry and the veterinary profession that perhaps potential owners were unable to find the type of new pet they desired (i.e., acquisition issue). Business advisors and consultants suggested that with the success of spay/neuter programs to address the nation's unwanted pet problem, too few pets were now available for prospective pet owners. American Humane Association is interested in another possible reason—that pets are not being retained in homes. This “leaky funnel” issue could be a very significant reason for fewer pets in homes, especially as many Americans have just experienced the worst recession since the Great Depression. The resulting increase in

*“It may be that a lower percentage of households are able to afford and provide responsible pet ownership.”*



<sup>32</sup>Tasker, L. (2007). Stray animal control practices (Europe). WSPA and the RSPCA International.

<sup>33</sup>American Pet Products Association – APPA's 2011-2012 National Pet Owners Survey.

<sup>34</sup>AVMA Pet Demographic Sourcebook – News Release, August 2012, [www.avma.org/News/PressRoom](http://www.avma.org/News/PressRoom).

unemployment and loss of family homes may be contributing to pets being returned to shelters. It may be that a lower percentage of households are able to afford and provide responsible pet ownership, or following foreclosure are unable to find alternative housing that allow their animals to be retained. If pets are not retained after acquisition, then pets are not afforded a chance for long, healthy lives, and the pet industry and veterinary profession are not afforded the opportunity to provide appropriate health care, products, and services to these animals.

### **Summary of Results from Phase I of Keeping Pets (Dogs and Cats) in Homes<sup>1</sup>:**

Phase I of the *Keeping Pets (Dogs and Cats) in Homes* study identified barriers to pet ownership among adults in U.S. households. Surveys were conducted in February 2012 on a non-random sample of 1,500 online respondents who had not owned a pet as an adult, or who had owned a cat or dog previously but not within the past 12 months. Male and female respondents were roughly equal overall. Those over the age of 65 were most represented as prior dog or cat owners with age more evenly distributed amongst non-owners. The surveys revealed five distinct conclusions:

*“... nearly two-thirds of respondents reported they were most likely to procure any future pets through humane groups, shelters, and rescue organizations.”*

- Dogs were more likely to be considered as a future pet than cats. Previous dog owners were more likely to consider adding a dog to their household while previous cat owners were not as likely to consider adding another cat to their family. In addition, those who had never owned a dog or cat as an adult said they were more likely to consider owning a dog rather than a cat (this is even true if they had a dog as a childhood pet versus if they had a cat as a childhood pet).
- Fewer prior owners acquired their pet from shelters or rescue organizations than from friends, family, and neighbors. In dramatic contrast, nearly two-thirds of respondents reported they were most likely to procure any future pets through humane groups, shelters, and rescue organizations.
- The leading barriers to current ownership were cost, lifestyle, cleanup, or grief over the loss of a beloved pet. For previous dog and cat owners, lifestyle issues included a lack of time to care for the pet and travel away from home; the expenses of veterinary and general care also inhibited future ownership. Many previous owners of dogs and cats indicated that they were still grieving the loss of their pet, and this was a factor in their not obtaining another pet. This grief was noted even though twelve months or longer had passed since the prior pet had left the family. More than one-third of non-owners noted a general dislike of cats as the main reason why they do not currently own one; only 12 percent of non-owners indicated a general dislike of dogs.
- Those who had owned a dog or cat within the last five years, but did not own one at the time of the study, were more likely to consider adding another dog or cat to their household. Beyond this five-year mark, however, the likelihood of pet ownership dropped sharply as people cited lifestyles that were no longer conducive to supporting a dog or cat in the household. Interestingly, older people were not as receptive to adding a dog or cat to their homes despite research showing the health and emotional benefits of pet ownership (including increased exercise and companionship).
- There were marked demographic differences between those who would consider owning a dog and those owning a cat, suggesting different adoption and retention strategies.

The bulk of research to date has investigated relinquishment of dogs and cats at the point of return to shelters. Fewer studies have reported on the outcomes of dogs and cats after adoption. Unfortunately there are considerable differences in location, type, design, and quality of studies, sampled population, analysis, and interpretation. Additional investigation into adoption success and failure for different species, and exploration of intervention strategies, may help reduce the risk of pets leaving homes after adoption. Interventions that target owners at the point of adoption as well as in the first few weeks of ownership are likely to be the most effective. In 1989 Kidd et al. proposed that adopters be questioned about expectations for and attitudes toward their adopted pets at the point of acquisition, and those with unrealistic expectations be encouraged to receive appropriate training and counseling in responsible and informed pet ownership<sup>16</sup>. Tailored intervention methods for more at-risk adopters are the next critical step in further reducing pet abandonment in the United States.





## Methods

For Phase II of the *Keeping Pets (Dogs and Cats) in Homes* study, a 56-question survey was created to determine the percent of pets remaining in adoptive homes six months after adoption and the disposition of pets no longer in homes; and to better understand reasons for those outcomes, to explore owner attitudes before adoption, and experiences and practices following adoption; and to obtain owner, household, and pet demographics. The survey was also translated to Spanish so that adopters preferring that language could be interviewed.

Three cities were selected for Phase II: Charlotte, N.C.; Denver, Colo.; and Fort Worth, Texas. These cities were selected based upon the following criteria:

1. Each city had at least one leading private shelter and one public animal control shelter, with each handling a sufficient number of dog and cat adoptions per month for the purposes of this study.
2. The cities chosen had intake and euthanasia rates adequate for conducting the research in the study timeline.
3. The cities were mid-sized, with populations of approximately two-thirds to three-quarters of a million people, and included diverse ethnic representations.
4. Geographically, the cities represented specific regions of the country.

The largest public and private shelter facilities in each city were contacted and agreed to participate. A small honorarium was paid to each participating organization as a token of gratitude for their cooperation and the time they spent providing necessary data. Each facility provided information to the researchers about their operations, adoption policies, budget and funding, intake and return metrics, and adoption resources for use in analysis.

Sample size calculations were performed assuming an alpha of 5 percent, desired power of 80 percent and examining potential relinquishment rates of between 10 and 20 percent. In addition, the impact of likely response rates (survey completion rates) was considered. Calculations indicated that a minimum of 100 adopters (50 dog and 50 cat) from each of the six facilities would be needed. Based on input from relevant experts, the researchers expected a 50 percent survey completion rate, and so adoption records for a time span of approximately six months prior to survey administration, during which at least 100 dogs and 100 cats would have been adopted from each facility, were requested. Most shelters conducted enough adoptions during a two-month span to fulfill these numbers, and in those cases all records from five to seven months prior were obtained. In cities where participation was lower than anticipated (see Discussion section), adoption records were obtained over a longer period of time (five to eight months prior to survey administration).

A marketing company was selected in each city to conduct surveys with adopters. Selection of local firms ensured survey callers were familiar with the communities in which the study was being conducted and allowed for bilingual capability.

Records for all dog and cat adoptions completed approximately six months prior were sent directly to the marketing companies. The shelters were asked to supply adopter and pet demographic information from the adoption record. Because of differences in record keeping, not all shelters were able to provide all requested information.

In cases where more adoption records than needed were provided, the marketing companies contacted participants in chronological order until the quantities of surveys specified by the researchers were attained. Marketing firms were required to use information provided only for the purposes of the current study, were not allowed to share personal information with any third parties, and were required to destroy all adopter information shortly after completion of the survey process.

One facility's internal procedures required adopters to be contacted directly by the shelter organization to request participation and complete consent forms, prior to being contacted by the local marketing firm. The other five facilities sent a postcard to adopters informing them of the study and alerting them to a forthcoming phone call from the marketing firm. Survey calls commenced approximately one week after postcards were sent. The marketing companies called adopters in chronological order by adoption date to ensure there was no personal or methodological bias in those contacted and to allow for approximately six months to have passed since adoption before survey administration.

In the case of the facility requiring consent forms, adoption records of only those who submitted completed forms were then sent to the local marketing firm, and calls were initiated shortly thereafter. In all cases, if the marketing firms were unable to complete the necessary number of surveys from the sample provided, additional records were provided.

Surveyors asked to speak with the adult primarily responsible for the adopted pet\*. Strict adherence to informed consent guidelines were followed to ensure participants' identities were protected. Institutional Review Board and Institutional Animal Care and Use Committee review and/or approval were obtained by American Humane Association prior to the launching of the study phase.

Shelter survey results were entered into a database (Excel, Microsoft Inc., Seattle, Wash.) and analyzed for associations using the statistical software package STATA 10 (StataCorp. 2007. Stata Statistical Software: Release 10. College Station, Texas: StataCorp LP). Descriptive statistics were calculated for each variable of interest. Logistic regression was used to screen individual variables and their association with pet retention. Proportions, odds ratios and 95 percent confidence intervals (CIs) were calculated. Statistical significance level for these

analyses was set  $\alpha < 0.05$ , although comparisons with borderline significance ( $0.10 > \alpha > 0.05$ ) are indicated in tables. Variables significantly associated with retention or those identified as of key interest were further examined using *OpenEpi.com* 'TwobyTwo' analysis. Chi-square or exact tests were used depending on expected values in tables. Odds ratios and 95 percent CIs were reported. Likert scale results for various pet behavioral and health concerns were summed for survey respondents. The variable "concern" was collapsed dichotomously into "low concern" and "moderate concern" to look for associations with retention and advice-seeking behaviors. Intraclass correlation coefficient (ICC) was used to assess clustering of data at the shelter level.



\*Participants were told they could choose not to respond to any question or questions they did not want to answer.



# Results

## Participant Sites:

There was no significant difference in retention between states, shelters, shelter type (public or private), intake policy (open or limited), annual animal intake volume, shelter budget, or reported shelter requirements and services [Tables 1-2].

Surveys were completed by 572 adopters. In Charlotte, 336 adopters were contacted before 202 agreed to participate (60% percent participation). In Denver, 320 adopters were contacted before 170 agreed to participate (53% participation). In Fort Worth, 600 adopters were contacted before 200 agreed to participate in the study (33% participation). All adopters agreeing to participate in the study were administered the survey. In total, 301 (52.6%) surveys were completed by adopters from humane societies, and 271 (47.4%) were completed by adopters from animal control facilities. One shelter had a limited admission policy and five had an open admission policy. Two shelters had operating budgets under \$3 million annually, three had operating budgets between \$3 and \$5 million, and one had an operating budget over \$5 million. Two shelters took in under 10,000 dogs and cats annually, two took in 10,000-20,000, and two took in more than 20,000 [Table 1]. Four shelters offered adopters a free veterinary exam [Table 2].

## Owner Characteristics:

Demographic information was gathered from all participants but respondents could refuse to answer one or more questions [Table 3]. In general, owners who refused to answer specific questions (e.g., children in the home, age, race) were less likely to retain their pet. Most households (61.9%) had two adults over 18 years in residence, 21.2 percent had one adult over the age of 18 years, and 12.1 percent had three over the age of 18 years. Retention of a pet was higher for those 25-34 years of age, followed closely by those aged 45-54 years. The majority (87.2%) of households had no children under the age of 5 years in residence, and nearly three-quarters (72.4%) had no children aged 6-17. More than three-quarters (78%) of participants identified themselves as Caucasian. Educational levels, household earnings, and geographical location (e.g., city, rural) were also captured. Retention of a pet was higher for college graduates and lower for those living in a small town. One hundred thirty-two respondents (23.1%) were first time pet owners as adults and 440 (76.9%) were adults who had owned a pet before [Table 4]. There were no differences in retention rates amongst first time pet owners or those with other pets already in the home. Fourteen respondents from North Carolina indicated that they had adopted more than one pet at the same time and all were still in their homes.

## Pet Characteristics:

Of the 572 surveys completed, 291 were by adopters of dogs (50.9%) and 281 were by adopters of cats (49.1%). Two hundred eighty of the pets were male (49%) and 292 (51%) were female [Table 5]. There were no differences in retention rates between dogs (87.6%) or cats (91.5%), or between males (89.6%) or females (89.4%). There tended to be a risk of non-retention for those few animals (4%) reported by adopters as sexually intact. Ninety-six percent of adopted pets were reported by their owners to have been spayed or neutered at adoption. In North Carolina (the only state to report pet ages), 58.9 percent of pets were 12 months or less. Approximately 5 percent were over the age of five years.

*“Retention of a pet was higher for those 25-34 years of age, followed closely by those aged 45-54 years.”*

*“Retention of a pet was higher for college graduates and lower for those living in a small town.”*



*“Nearly two-thirds of pets leaving the home within six months of adoption left within the first two months.”*

### **Retention:**

Sixty pets (10.5%) were no longer in the home at the time of the survey. Forty two percent of those no longer in the home were returned to their shelters of origin, while the others had different fates (given to another person, lost, or died). Of the 60 dogs and cats not retained in homes, 16 (26.7%) left the home within two weeks of adoption, 22 (36.7%) left between two weeks and two months, and 22 (36.7%) left between two months and the time of the survey. Thus, nearly two-thirds of pets leaving the home within six months of adoption left within the first two months [Table 6].

### **Veterinary Visits:**

Overall, 89.6 percent of dogs had a veterinary visit compared to 77.5 percent of cats; the odds that a dog would see a veterinarian were 2.5 times greater than for cats [Table 7a]. The odds of a dog being retained in its home at six months was 9.9 times higher for those who had veterinary visits than for those who did not, while the odds of a cat being retained in its home at six months was 4.9 times higher for those who had veterinary visits [Table 4]. Whether or not the adopter was offered a free exam had no impact on whether or not the pet had a veterinary visit, overall, in either dogs or cats.

Table 7b shows retention of dogs and cats by whether or not they had a veterinary visit. There is no difference in retention between dogs (91.9% retained) and cats (94.9%) who had a veterinary visit. However, among those with no veterinary visit, dogs were significantly less likely to be retained than cats. Looking at duration of ownership in non-retained pets, dogs and cats who had visited a veterinarian had no difference in their likelihood of leaving within the first two months following adoption or between two and six months. However, for pets who did not visit a veterinarian, 13 of 14 non-retained dogs left within two months of adoption (92.9%), whereas 61.5 percent (8 of 13) of non-retained cats left within two months of adoption [Table 7c]. Although the numbers of non-retained dogs and cats is rather small, this comparison approaches statistical significance using appropriate exact tests and indicates a more complex relationship among the variables species, veterinary visits, and duration of retention.

### **Owner Attitudes, Experiences, and Practices:**

Interestingly, owners who reported that their pets took between two weeks and two months to adjust were more likely to retain their pets than those who reported that their pets took less than two weeks to adjust or those who reported that their pets never did adjust to the home [Table 4]. Adopters who described themselves as having been sure they wanted a dog or cat but were open to what was available at the shelter were neither more nor less likely to retain their pets than those who had done a lot of thinking or much research and got exactly what they wanted, or those whose adoption choice was a spur-of-the-moment decision. Those who adopted a pet for security or protection were less likely to retain those pets, though our sample of adopters in this category was too small to detect significance. Additionally, those who acquired their dogs for exercise may have been more likely to retain their pet, but again the sample size may have been too small to detect a significant difference. Adopters who cited wanting a pet for companionship, to teach their children responsibility, and/or to rescue a pet did not differ significantly in retention from adopters who did not cite these reasons (owners could cite more than one reason for acquiring a pet in the survey).

Pets were more likely to be retained when owners sought advice from family, friends, or a veterinarian. When compared with those who did not seek advice, those who sought advice from friends were 2.9 times more likely to retain their pets, those that sought advice from veterinarians were 3 times more likely to retain, and those that sought advice from shelters were about half as likely to retain their pets. One possible explanation for the phenomena is that owners will seek counsel from different sources depending upon the degree of difficulty they are having, and owners having more problems with their pets may be more likely to seek help from the adoptive shelter or as a last resort prior to returning the animal to the originating shelter.

Pets who slept on a family member's bed were more likely to be retained than pets who slept elsewhere in the house (pet bed, floor, crate, furniture). For the 32 pets (5.6%) reported to have slept outside, 29 (90.6%) were retained.

#### **Owner Concerns:**

Owners who ranked various concerns (e.g., cost, time commitment, human health, animal health, and various behaviors) as “always” were less likely to retain their pets than those who ranked such concerns as “some” or “never” [Table 8]. Behaviors, when ranked “always” that were associated with less retention included: unfriendly to other humans, destructive, disobedient, soiling, attention-seeking, barking, and hyperactivity. There were no differences in retention between animals deemed to show more or less affection to their owners, or animals reported as unfriendly to other animals.

*“Pets were more likely to be retained when owners sought advice from family, friends, or a veterinarian.”*



## Discussion

*“Certainly, shelters throughout the United States are struggling to provide new strategies whereby euthanasia rates of unwanted pets may be further reduced.”*



Phase II should be considered a pilot study with results used to increase our understanding of retention of adopted pets and to inform development of intervention strategies that might increase retention rates for newly acquired pets. The study’s cities were chosen purposively to reflect different areas of the country and because they had eligible and willing shelters. We have no information on what extent the study sites, or response rates, reflect shelters or adopters in other areas.

The retention rates in this study are relatively similar to estimates from experts in the field and previous reports. Of the 60 pets who were not in their homes six months post-adoption, 20 percent of these were lost, stolen, or died; 30 percent were given away (often to friends or family who wanted the pet); and 41.7 percent were returned to the shelter. We cannot be certain that those consenting to take the survey represent all adopters retaining or relinquishing their pets. Among participants, non-retainers of dogs were somewhat less likely to answer certain survey questions. If non-retainers are unlikely to participate in a survey like this, or less likely to answer questions, they might also be more difficult to access or affect with intervention strategies. This may suggest caution in planning other studies if truly representative samples and high participation rates are needed as there may be an indication of volunteer and compliance bias. Such challenges will need to be addressed when designing Phase III. Due to the relatively high rate of retention, there were limits on the statistical analysis in terms of the numbers in some comparisons. There was adequate power to detect some differences, and many of the non-significant associations seemed to reflect a true state of similarity rather than a lack of power. However, as in many studies, information should be extrapolated with caution.

Certainly, shelters throughout the United States are struggling to provide new strategies whereby euthanasia rates of unwanted pets may be further reduced. While the challenges for effective interventions are seemingly high, the goal of saving more lives warrants further research and testing. American Humane Association looks forward to promising next steps.

# Promising Next Steps in Increasing Adoption Retention

Phases I and II of the study revealed several key findings about barriers to pet ownership and post-adoption retention, and they provide a framework by which intervention strategies aimed at increasing adoption retention may be informed.

The findings suggest that some of the more promising strategies aimed at increasing adoption retention may include:

1. Supporting younger future cat owners (18-34 years) (Phase I) and promoting pet ownership among young adults (25-34 years) overall (Phase II)
2. Continuing to assess negative attitudes toward cats, especially among people who have never owned a cat (Phase I)
3. Understanding that ongoing grief is a barrier to new pet ownership and identifying methods to help people work through grief, celebrate the prior pet, and reenter the ownership pool (Phase I)
4. Understanding that 64 percent of prospective dog owners and 56 percent of prospective cat owners may be adopting pets from shelters and rescue agencies and offering support at this point of acquisition (Phase I)
5. Working with broad and diverse segments of society to reduce existing barriers to ownership, such as housing restrictions and veterinary/general expenses (Phase I)
6. Understanding that research or preparatory work completed before adoption may not have a large effect upon retention (Phase II)
7. Implementing intervention strategies within the first, critical weeks of adoption (Phase II)
8. Building awareness in shelters that prior adopters calling for advice may be considering relinquishing pets and these shelters should carefully address an owner's concerns (Phase II)
9. Providing behavioral support that focuses on solidifying the human-animal bond (Phase II)
10. Creating innovative strategies to increase adoption retention by implementing post-adoption programs that facilitate veterinary visits and cultivate a supportive relationship between adopters, shelter facilities, and communities (Phase II)

*“While the challenges for effective interventions are seemingly high, the goal of saving more lives warrants further research and testing.”*



# Appendix



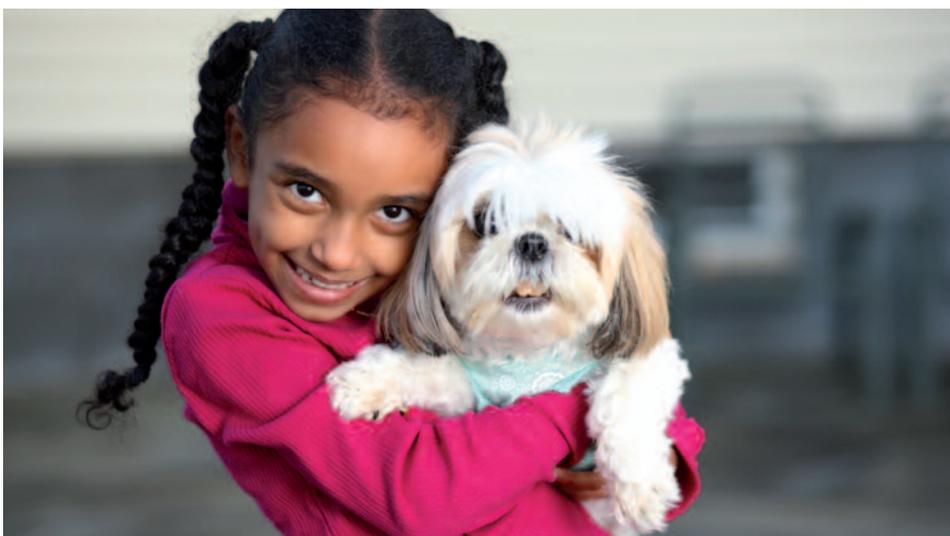
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**Table 1. Description of sites, shelters, participants, and retention rates.**

<b>Variable (Total Number)<sup>a</sup></b>	<b>Group</b>	<b>Response Number (% of Total Number)</b>	<b>Retained<sup>b</sup> Number (% of Response)</b>
State (572)	North Carolina (NC)	202 (35.3)	183 (90.6)
	Texas (TX)	200 (35.0)	177 (88.5)
	Colorado (CO)	170 (29.7)	152 (89.4)
Shelter type (572)	Humane Society (HS)	301 (52.6)	270 (89.7)
	Animal Control (AC)	271 (47.4)	242 (89.3)
Shelter (572)	NC HS	101 (17.7)	93 (92.1)
	NC AC	101 (17.7)	90 (89.1)
	TX HS	100 (17.5)	90 (90.0)
	TX AC	100 (17.5)	87 (87.0)
	CO HS	100 (17.5)	87 (87.0)
	CO AC	70 (12.2)	65 (92.9)
Shelter intake type (6)	Limited	1 (16.7)	93 (92.1)
	Open	5 (83.3)	419 (89.0)
Shelter Budget (6) (In Dollars)	0-3M	2 (33.3)	183 (92.0)
	3-5M	3 (50.0)	242 (88.3)
	>5M	1 (16.7)	87 (87.0)
Shelter annual animal intake (6)	0-10K	2 (33.3)	158 (92.4)
	10-20K	2 (33.3)	177 (88.1)
	>20K	2 (33.3)	177 (88.5)

<sup>a</sup> Number within parenthesis is the sample size.

<sup>b</sup> There were no differences in retention rates across categories within these variables.



**Table 2. Characteristics of the six shelters and services offered by the shelters.**

<b>Variable</b>	<b>Group</b>	<b>Response Number (%)</b>
Free veterinary exam	Yes No	4 (66.7) 2 (33.3)
Number of paid employees dedicated to adoption customer service	0-5 6-10 >10	2 (33.3) 2 (33.3) 2 (33.3)
Number of volunteers dedicated to adoption customer service	0-9 10-20 >20	2 (33.3) 2 (33.3) 2 (33.3)
Pre-adoption requirements: adoption application that includes questions on family makeup, reason for adopting, etc.	Yes No	4 (66.7) 2 (33.3)
Pre-adoption requirements: landlord approval for renters	Yes No	1 (16.7) 5 (83.3)
Pre-adoption requirements: require pet-to-pet visits with other pets in the home	Yes No	0 (0) 6 (100)
Post-adoption services: written materials given to adopters upon adoption	Yes No	5 (83.3) 1 (16.7)
Post-adoption services: phone assistance/hotline/helpline	Yes No	3 (50.0) 3 (50.0)
Post-adoption services: website	Yes No	6 (100) 0 (0)
Post-adoption services: classes/training/workshops offered by shelter	Yes No	4 (66.7) 2 (33.3)



**Table 3. Owner and household demographics and retention (572 participants, N=number).**

Variable	Group	Response N (% of participants)	Retained N (% of Response N)	95% CI <sup>a</sup>	Odds Ratio <sup>b</sup>
N of adults over 18 in the home	0	1 (0.2)	0 (0.0)	-	-
	1	121 (21.2)	107 (88.4)	82.7-94.2	ns
	2	354 (61.9)	315 (89.0)	86.0-92.4	Ref
	3	69 (12.1)	65 (94.2)	88.6-99.8	ns
	4	18 (3.1)	18 (100)	-	ns
	5	6 (1.0)	6 (100)	-	-
	9	3 (0.5)	0 (0.0)	-	-
Children age 6-17 in the home	Yes	155 (27.1)	137 (88.4)	84.0-93.9	Ref
	No	414 (72.4)	373 (90.0)	87.2-93.0	ns
	Did not answer	3 (0.5)	1 (33.3)	-32.1-98.8	0.06
Children ≤ 5 in the home	Yes	70 (12.2)	59 (84.3)	75.7-92.9	0.56
	No	499 (87.2)	451 (90.4)	88.0-93.1	Ref
	Did not answer	3 (0.5)	1 (33.3)	-32.1-98.9	0.05
City or rural	City	402 (70.3)	367 (91.3)	86.2-92.3	Ref
	Small town	95 (16.6)	80 (84.2)	80.6-94.1	0.51
	Rural	73 (12.8)	65 (89.0)	87.3-99.0	ns
	Did not answer	2 (0.3)	0 (0)	-	-
Age	18-24	83 (14.5)	76 (91.6)	85.5-97.6	ns
	25-34	118 (20.6)	111 (94.1)	89.8-98.4	2.8
	35-44	133 (23.3)	113 (85.0)	78.9-91.1	Ref
	45-54	114 (19.9)	107 (93.9)	89.4-98.3	2.7
	55-64	71 (12.4)	60 (84.5)	76.0-93.0	ns
	65+	44 (7.7)	40 (90.0)	82.3-99.5	ns
	Did not answer	9 (1.6)	5 (55.6)	21.0-90.0	0.22
Race	Hispanic	45 (7.9)	41 (91.1)	82.7-99.5	ns
	African American	39 (6.8)	32 (82.1)	69.8-94.2	0.48
	Caucasian	446 (78.0)	404 (90.6)	87.9-93.3	Ref
	Asian	8 (1.4)	6 (75.0)	42.8-107.1	ns
	Native American	5 (0.9)	5 (100)	-	-
	Multi-racial	16 (2.8)	15 (93.8)	81.4-106.0	ns
	Other	3 (0.5)	3 (100)	-	-
	Did not answer	10 (1.7)	6 (60.0)	27.9-92.1	0.16
Education	< High school	13 (2.3)	11 (84.6)	64.2-105.0	ns
	High school grad	70 (12.2)	61 (87.1)	79.2-95.0	ns
	Some college	160 (28.0)	138 (86.3)	80.8-91.6	Ref
	Trade school	29 (5.1)	26 (89.7)	78.4-100.9	ns
	College grad	196 (34.3)	182 (92.9)	89.2-96.4	2.1
	Post graduate	88 (15.4)	82 (93.2)	87.9-98.5	2.2
	Did not answer	16 (2.8)	12 (75.0)	53.0-97.0	ns
Income (In Dollars)	< 10K	21 (3.7)	19 (90.5)	77.6-103.4	ns
	10K – 19K	34 (5.9)	30 (88.2)	77.2-99.3	ns
	20K – 29K	43 (7.5)	38 (88.4)	78.7-98.1	ns
	30K – 49K	107 (18.7)	97 (90.7)	85.1-96.2	Ref
	50K – 69K	97 (17.0)	86 (88.7)	82.3-95.0	ns
	70K – 99K	85 (14.9)	78 (91.8)	85.9-97.7	ns
	100K+	81 (14.2)	73 (90.1)	83.6-96.7	ns
	Did not answer	104 (18.2)	91 (87.5)	81.1-93.9	ns

<sup>a</sup>The 95% CI is the projected range of values around the point estimate for the retention rate (%). For example, for households reporting one adult over 18, 88.4% had retained their pets. If this study was (theoretically) repeated we would expect that estimate to lie between 82.7%-94.2%, in 95% of studies. Not calculated if retention % = 0 or 100.

<sup>b</sup>Odds ratio (OR) from the logistic regression of retention on the variable. An OR greater than 1 indicates that the animals in that category were more likely to be retained, OR<1

indicates animals were less likely to be retained, compared to animals in the reference category.

'Ref' is the reference category that served as the baseline for comparison.

**Yellow:** Significantly different in likelihood of being retained compared to reference level category (at p≤0.05); **Green:** Comparison as above, but p-value between 0.05 and 0.10). Comparisons 'ns' had p-values >0.10.

**Table 4. Pet-ownership characteristics and retention (N= number).**

*Note: not all questions were asked of all participants, hence variable number of respondents.*

Variable	Group	Response N (% of respondents)	Retained N (% of Response N)	95% CI <sup>a</sup>	Odds Ratio <sup>b</sup>
First Time Pet Owner (N=572)	Yes	132 (23.1)	120 (90.9)	86.0-95.8	Ref
	No	440 (76.9)	392 (89.1)	86.2-92.0	ns
Other pets in home (N=440)	Yes	268 (60.9)	238 (88.8)	85.0-92.6	Ref
	No	172 (39.1)	154 (89.5)	84.9-94.1	ns
Other pets in 1 year (N=170)	Yes	73 (42.9)	66 (90.4)	83.6-97.3	Ref
	No	97 (57.1)	87 (89.7)	83.6-95.8	ns
Other pet – dog (N=269)	Yes	165 (61.3)	148 (89.7)	85.7-94.8	Ref
	No	104 (38.7)	90 (86.5)	79.9-93.1	ns
Other pet – cat (N=264)	Yes	142 (53.8)	127 (89.4)	84.3-94.5	Ref
	No	122 (46.2)	108 (88.5)	82.8-94.2	ns
Other pet – other (N=268)	Yes	24 (9.0)	22 (91.7)	80.3-1.03	Ref
	No	241 (89.9)	214 (88.8)	84.8-92.8	ns
	Did not answer	3 (1.1)	-	-	-
Other pets – number of dogs in home (N=165)	1	110 (66.7)	101 (91.8)	86.6-97.0	Ref
	2	46 (27.9)	40 (87.0)	77.0-96.9	ns
	3	7 (4.2)	6 (85.7)	57.5-	ns
	4	1 (0.6)	1 (100)	113.9	-
	5	1 (0.6)	1 (100)	-	-
Other pets – number of cats in home (N=140)	1	88 (62.9)	78 (86.6)	81.9-95.4	Ref
	2	35 (25.0)	30 (85.7)	73.8-97.3	ns
	3	11 (7.9)	11 (100)	-	-
	4	1 (0.7)	1 (100)	-	-
	5	3 (2.1)	3 (100)	-	-
	7	1 (0.7)	1 (100)	-	-
	Did not answer	1 (0.7)	-	-	-
Pets adopted on adoption day (NC only) (N=202)	1 pet	188 (93.1)	169 (89.9)		
	>1 pet	14 (6.9)	14 (100)		
Research prior to adoption (N=572)	Much research	162 (28.3)	143 (88.3)	83.3-93.3	ns
	Some research	275 (48.1)	249 (90.5)	87.1-94.0	Ref
	Little/no research	132 (23.1)	117 (88.6)	83.2-94.1	ns
	Did not answer	3 (0.5)	3 (100)	-	-
Companionship (N=572)	Yes	434 (75.9)	390 (89.9)	87.0-92.7	Ref
	No	138 (24.1)	122 (88.4)	83.0-93.8	0.860
Security (N=572)	Yes	44 (7.7)	36 (81.8)	70.3-93.4	0.49
	No	528 (92.3)	476 (90.2)	87.6-92.7	Ref
Teach child responsibility (N=572)	Yes	68 (11.9)	59 (86.8)	78.6-94.9	ns
	No	504 (88.1)	453 (89.9)	87.2-92.5	Ref
Exercise (N=572)	Yes	46 (8.0)	44 (95.7)	89.7-1.02	ns
	No	526 (92.0)	468 (89.0)	86.3-91.7	Ref
To rescue a pet (N=572)	Yes	234 (40.9)	210 (89.7)	85.9-93.6	1.04
	No	338 (59.1)	302 (89.3)	86.0-92.6	Ref
Time to adjust (N=572)	2wks2	434 (75.9)	394 (90.8)	88.1-93.5	Ref
	2wk-2mo	112 (19.6)	108 (96.4)	93.0-99.9	2.7
	Never did	23 (4.0)	8 (34.8)	14.8-54.7	0.05
	Did not answer	3 (0.5)	2 (67.7)	-	-

Variable	Group	Response N (% of respondents)	Retained N (% of Response N)	95% CI <sup>a</sup>	Odds Ratio <sup>b</sup>
Advice - sources of advice and support on pet (N=571)	Family/friends	87 (15.2)	82 (94.3)	89.3-99.2	2.9
	Internet	96 (16.8)	87 (90.6)	84.8-96.5	1.68
	Library/bookstore	9 (1.6)	9 (100)	-	-
	Veterinarian	183 (32.0)	173 (94.5)	91.2-97.8	3.0
	Adoption shelter	67 (11.7)	49 (73.1)	62.4-83.9	0.47
	Other	21 (3.7)	20 (95.2)	85.9-1.04	3.48
	No advice sought	108 (18.9)	92 (85.2)	78.4-91.9	Ref
Veterinary visit (N=572)	Yes	476 (83.2)	444 (93.3)	91.0-95.5	5.7
	No	93 (16.3)	66 (71.0)	61.7-80.3	Ref
	Did not answer	2 (0.3)	1 (50.0)	-	-
	error	1 (0.2)	1 (100)	-	-
Vet visit – cat (N=281)	Yes	217 (77.2)	206 (94.9)	92.3-97.5	4.9
	No	63 (22.4)	50 (79.4)	74.6-84.1	Ref
	error	1 (0.4)	1 (100)	-	-
Vet visit – dog (N=291)	Yes	259 (89.0)	238 (91.9)	88.1-94.6	9.9
	No	30 (10.3)	16 (53.3)	47.6-59.1	Ref
	Did not answer	2 (0.7)	1 (50.0)	-	-
Sleep inside or outside (N=569)	Inside	537 (94.4)	482 (89.0)	87.2-92.3	Ref
	Outside	32 (5.6)	29 (90.6)	80.3-101	ns
Dogs Sleep inside – where (N=270)	Dog bed or crate	95 (35.2)	80 (84.2)	76.8-91.6	Ref
	Family bed	118 (43.7)	110 (93.2)	88.6-97.8	2.6
	Other	57 (21.1)	48 (84.2)	74.6-93.8	ns

<sup>a</sup> The 95% CI is the projected range of values around the point estimate for the retention rate (%). For example, for first time pet owners, 90.9% had retained their pets. If this study was (theoretically) repeated we would expect that estimate to lie between 86.0%-95.8%, in 95% of studies. Not calculated if retention % = 0 or 100.

<sup>b</sup> Odds ratio (OR) from the logistic regression of retention on the variable. An OR greater than 1 indicates that the animals in that category were more likely to be retained, OR<1 indicates animals were less likely to be retained, compared to animals in the reference category.

'Ref' is the reference category that served as the baseline for comparison.

**Yellow:** Significantly different in likelihood of being retained compared to reference level category (at  $p \leq 0.05$ ); **Green:** Comparison as above, but p-value between 0.05 and 0.10). Comparisons 'ns' had p-values >0.10.



**Table 5. Pet demographics and retention (572 participants, N=number).**

Variable	Group	Response N (% of participants)	Response N (% of participants)	95% CI <sup>a</sup>	Odds Ratio <sup>b</sup>
Species	Dog	291 (50.9)	255 (87.6)	83.8-91.4	Ref
	Cat	281 (49.1)	257 (91.5)	88.2-94.7	ns
Sex	Male	280 (49.0)	251 (89.6)	86.1-93.2	Ref
	Female	292 (51.0)	261 (89.4)	85.8-92.9	ns
Altered	Yes	549 (96.0)	494 (90.0)	87.5-92.5	Ref
	No	23 (4.0)	18 (78.3)	61.0-95.5	0.40
Age of animal at adoption (N=202; 370 not asked)	2-6 m	42 (20.8)	40 (95.2)	88.7-101.7	Ref
	6-12 m	77 (38.1)	72 (93.5)	87.9-99.6	ns
	12-24 m	25 (12.4)	23 (92.0)	81.1-102.9	ns
	24-60 m	41 (20.3)	35 (85.4)	74.4-96.3	ns
	> 60m	11 (5.4)	7 (63.6)	33.8-93.5	0.09
	Unknown	6 (3.0)	6 (100)	-	-

<sup>a</sup> The 95% CI is the projected range of values around the point estimate for the retention rate (%). For example, for Dogs 87.6% were retained. If this study was (theoretically) repeated we would expect that estimate to lie between 83.8%-91.4%, in 95% of studies. Not calculated if retention % = 0 or 100.

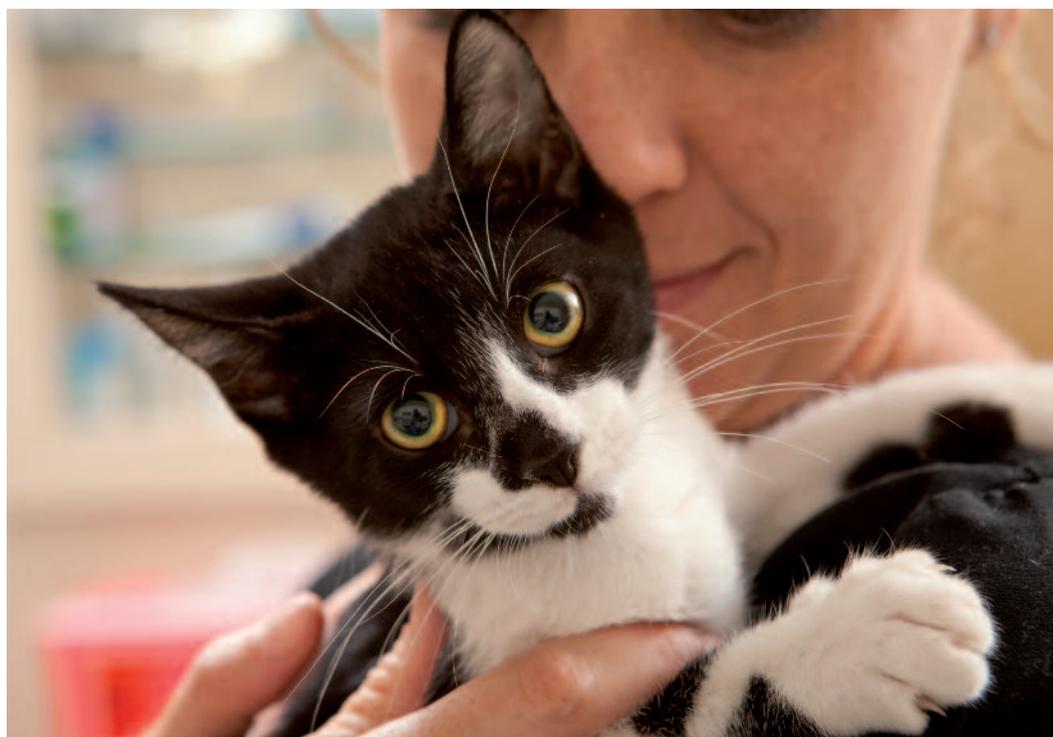
<sup>b</sup> Odds ratio (OR) from the logistic regression of retention on the variable. An OR greater than 1 indicates that the animals in that category were more likely to be retained, OR<1 indicates animals were less likely to be retained, compared to animals in the reference category.

'Ref' is the reference category that served as the baseline for comparison.

**Yellow:** Significantly different in likelihood of being retained compared to reference level category (at  $p \leq 0.05$ ); **Green:** Comparison as above, but p-value between 0.05 and 0.10). Comparisons 'ns' had p-values >0.10.

**Table 6. Pet retention and disposition of non-retained pets.**

Variable	Group	Number (% of N)
Pet retained in home (N=572)	Retained Not retained	512 (89.5) 60 (10.5)
If not retained, how long did animal remain in home (N=60)	2 weeks 2 weeks to 2 months >2 months	16 (26.7) 22 (36.7) 22 (36.7)
Outcome of non-retained animal (N=60)	Shelter or rescue Given away Died Lost Stolen Did not answer	25 (41.7) 18 (30.0) 5 (8.3) 6 (10.0) 1 (1.7) 5 (8.3)
Shelter non-retained animal returned to... (N=25)	Original shelter Other shelter Unknown shelter	23 (92.0) 1 (4.0) 1 (4.0)
Who were "given away" animals given to... (N=18)	Friend/family Neighbor, co-worker Someone else	5 (27.8) 5 (27.8) 8 (44.4)
How did non-retained pets die... (N=5)	Illness Accident Unknown	3 (60.0) 1 (20.0) 1 (20.0)



**Table 7a. Veterinary visits by species.**

*Note: there was missing information on 3 pets, total number=569.*

Variable	Group	Response Number (%)	95% CI <sup>a</sup>	Odds Ratio <sup>b</sup>
Vet visit	Dog (N=289)	259 (89.6)	85.5-92.7	<b>2.5</b>
	Cat (N=280)	217 (77.5)	72.2-82.0	Ref

**Table 7b. Veterinary visits by species and retention.**

Variable	Group	Retained		% retained (95%CI <sup>a</sup> )	Odds Ratio <sup>b</sup> (95% CI <sup>a</sup> )
		yes	no		
Vet visit - Yes	Dog	238	21	91.9 (87.9, 94.7)	ns
	Cat	206	11	94.9 (91.1, 97.2)	Ref
Vet visit - No	Dog	16	14	53.3 (36.1, 69.8)	<b>0.3 (0.12, 0.77)</b>
	Cat	50	13	79.4 (67.4, 87.7)	Ref

**Table 7c. Duration of retention in non-retained pets with no veterinary visit.**

Variable	Group	Duration of retention		% retained (95%CI <sup>a</sup> )	Odds Ratio <sup>c</sup> (95% CI <sup>a</sup> )
		<2 month	Between 2 and 6 months		
Vet visit - No	Dog	13	1	92.9 (66.5, 100)	<b>7.5 (0.85, 206.7)</b>
	Cat	8	5	61.5 (35.4, 82.4)	Ref

<sup>a</sup> The 95% CI is the projected range of values around the point estimate which precedes it. We are 95% sure that the true (population) value for the estimate would lie within the confidence interval range.

<sup>b</sup> Odds ratio (OR) from the logistic regression. OR<1 indicates animals were less likely to be retained, compared to animals in the reference category.

<sup>c</sup> Odds ratio (OR) from the two x two comparison, using Mid-P exact test (expected cell value<5) with P=0.07.

'Ref' is the reference category that served as the baseline for comparison.

**Yellow:** Significantly different in likelihood of being retained compared to reference level category (p<=0.05); **Green:** Comparison as above, but p-value between 0.05 and 0.10. Comparisons 'ns' had p-values >0.10; Comparisons 'ns' had p-values >0.10.

**Table 8. Behavior and health concerns about the pet and retention (572 participants, N=number if not 572).**

Variable	Group	Response N (% of participants)	Retained N (% of Response N)	95% CI <sup>a</sup>	Odds Ratio <sup>b</sup>
Cost	always	9 (1.6)	6 (66.7)	33.9-99.4	0.21
	some	49 (8.6)	40 (81.6)	70.7-92.6	0.46
	never	514 (89.9)	466 (90.7)	88.1-93.1	Ref
Time (N=571)	always	15 (2.6)	9 (60.0)	31.1-81.4	0.13
	some	63 (11.0)	54 (85.7)	77.0-94.4	ns
	never	493 (86.3)	449 (91.1)	88.6-93.6	Ref
Human health (N=571)	always	15 (2.6)	11 (73.3)	45.2-92.3	0.26
	some	55 (9.6)	53 (96.4)	91.4-101.4	ns
	never	501 (87.7)	448 (89.4)	86.7-92.1	Ref
Behavior (N=571)	always	17 (3.0)	10 (58.8)	34.7-83.0	0.13
	some	93 (16.3)	79 (84.9)	77.6-92.3	0.51
	never	461 (80.7)	423 (91.8)	89.2-94.3	Ref
Animal health (N=571)	always	23 (4.0)	17 (73.9)	55.6-92.3	0.26
	some	55 (9.6)	42 (76.4)	65.0-87.7	0.29
	never	493 (86.3)	452 (91.7)	89.2-94.1	Ref
Affection to owner	always	41 (7.2)	35 (85.4)	74.4-96.3	ns
	some	27 (4.7)	23 (85.2)	71.5-98.8	ns
	never	504 (88.1)	454 (90.1)	87.5-92.7	Ref
Unfriendly to others humans	always	13(2.3)	8 (61.5)	34.0-89.1	0.18
	some	69 (12.1)	63 (91.3)	84.6-98.0	ns
	never	490 (85.7)	441 (90.0)	87.3-92.7	Ref
Unfriendly to animals (N=561)	always	24 (4.3)	19 (79.2)	66.5-93.4	ns
	some	99 (17.6)	92 (92.9)	87.8-98.0	ns
	never	438 (78.0)	392 (89.5)	86.6-92.3	Ref
Destructive (N=571)	always	16 (2.7)	9 (56.3)	28.4-77.4	0.13
	some	160 (28.0)	149 (93.1)	89.1-97.1	ns
	never	395 (69.2)	354 (89.6)	86.6-92.6	Ref
Disobedient (N=571)	always	15 (2.7)	7 (46.7)	18.6-68.9	0.08
	some	144 (25.2)	133 (92.4)	88.0-96.7	ns
	never	412 (72.2)	372 (90.3)	87.4-93.1	Ref
Soiling	always	16 (2.8)	10 (62.5)	37.9-87.1	0.16
	some	132 (23.1)	114 (86.4)	80.5-92.3	ns
	never	424 (74.1)	388 (91.5)	88.8-94.2	Ref
Attention	always	32 (5.6)	23 (71.9)	56.0-87.7	0.28
	some	102 (17.8)	94 (92.2)	86.9-97.4	ns
	never	438 (76.6)	395 (90.2)	87.4-93.0	Ref
Barking	always	18 (3.1)	13 (72.2)	50.9-93.6	0.29
	some	109 (19.1)	98 (89.9)	84.2-95.6	ns
	never	445 (77.8)	401 (90.1)	87.3-92.9	Ref
Hyper (N=571)	always	31 (5.4)	25 (80.6)	63.5-92.7	0.36
	some	144 (25.2)	127 (88.2)	82.9-93.5	ns
	never	396 (69.4)	360 (90.9)	88.1-93.8	Ref

<sup>a</sup>The 95% CI is the projected range of values around the point estimate for the retention rate (%). For example, for owners reporting that cost was always a concern, 66.7% had retained their pets. If this study was (theoretically) repeated we would expect that estimate to lie between 33.9-99.4%, in 95% of studies. Not calculated if retention % = 0 or 100.

<sup>b</sup>Odds ratio (OR) from the logistic regression of retention on the variable. An OR greater than 1 indicates that the animals in that category were more likely to be retained, OR<1 indicates

animals were less likely to be retained, compared to animals in the reference category.

<sup>c</sup>'Ref' is the reference category that served as the baseline for comparison.

**Yellow:** Significantly different in likelihood of being retained compared to reference level category (at p<0.05); **Green:** Comparison as above, but p-value between 0.05 and 0.10. Comparisons 'ns' had p-values >0.10.

**Table 9. Factors associated with non-retention – Summary from the Literature Review.**

<b>Variable</b>	<b>Factors</b>
Adopters at risk	<ul style="list-style-type: none"> <li>•First-time owners</li> <li>•Married couples with children</li> <li>•Younger people</li> <li>•Those without a high school education</li> <li>•Those renting apartments or homes with pet restrictions</li> <li>•Those with little time to devote to pet care</li> <li>•Multi-pet households</li> <li>•Low-income households</li> </ul>
Dogs at risk	<ul style="list-style-type: none"> <li>•Under the age of 2 years</li> <li>•Large-breed dogs</li> <li>•Mix-breed dogs</li> <li>•Intact dogs</li> <li>•History of behavioral issues</li> <li>•History of health issues</li> <li>•Dogs obtained for little or no cost</li> <li>•Dogs who spend most of the day in a yard or crate</li> <li>•Dogs obtained when older than 6 months</li> <li>•Lack of formal obedience training</li> <li>•Lack of veterinary care</li> </ul>
Cats at risk	<ul style="list-style-type: none"> <li>•Under the age of 2 years</li> <li>•Intact cats</li> <li>•History of behavioral issues</li> <li>•History of health issues</li> <li>•Cats allowed outdoors</li> <li>•Lack of veterinary care</li> </ul>
Regions at risk	<ul style="list-style-type: none"> <li>•Regions/communities where incomes are lower than national average</li> <li>•Certain metropolitan areas for cats</li> </ul>
Time of ownership at risk	<ul style="list-style-type: none"> <li>•0-6 months following adoption</li> </ul>



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