

Human and Animal Factors Related to the Relinquishment of Dogs and Cats in 12 Selected Animal Shelters in the United States

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Since the 1940s, perceived companion animal overpopulation in the United States has been an important issue to the animal welfare community (Moulton, Wright, & Rinky, 1991). This surplus of animals has resulted in millions of dogs and cats being euthanized annually in animal shelters across the country. The nature and scope of this problem have been notoriously difficult to characterize. The number of animal shelters in the United States, the demographics of the population of animals passing through them, and the characteristics of pet owners relinquishing animals are poorly understood. What portion of these animals are adopted or euthanized, why they are

relinquished, and their source of acquisition are all questions for which there have been little data. Consequently, we are no closer to answering the fundamental question of how and why many animals are destroyed each year in shelters (Arkow, 1994).

In the 1970s, as the result of a number of articles in both the scientific and popular press, efforts were undertaken to resolve the overpopulation problem, although no scientific research had been done to characterize the nature of the problem or evaluate the efficacy of interventions (Rowan & Williams, 1987). The most prevalent belief at that time was that most of the companion animals coming to shelters who were subsequently euthanized were puppies and kittens, and the solution to the problem was to decrease the birth rate by promoting aggressive spaying and neutering programs (Arkow, 1991). Others promoted a broader approach, including sterilization programs, enhanced pet owner education, and tougher animal control ordinances and enforcement (Wright, 1986).

Although the number of sheltered animals being euthanized has declined over the past 20 years (Rowan & Williams, 1987), it is still unclear which, if any, of these changes has been most effective (Wilson & Rowan, 1985), or whether other factors unrelated to the intervention strategies are responsible (Arkow, 1991). Individuals in the shelter community report that while shelters still euthanize large numbers of kittens, most dogs in shelters are young adults exhibiting potentially resolvable behavior problems that owners are ill-equipped to handle (Caras, 1993; Rollin, 1991). Anecdotal and unsubstantiated reports state that 50% to 70% of all euthanasias are the result of behavior problems (Spencer, 1993). Recent studies of individual shelters have begun to identify both human and animal characteristics that may put animals at increased or decreased risk for relinquishment (Patronek, Glickman, Beck, McCabe, & Ecker, 1996x, 1996b).

More data are needed to characterize the companion animal surplus in the United States. Different groups have attempted to provide solutions, but have not coordinated their efforts or provided adequate evaluation of the success of implemented programs (Wilson & Rowan, 1985). The National Council on Pet Population Study and Policy (NCPSP) was created in 1993 (Olson & Salman, 1992) to address these concerns and coordinate three epidemiological studies:

1. The *National Household Survey*, designed to characterize the population of dog and cat owners and the acquisition, ownership, and disposition of these pets.
2. The *Regional Shelter Survey*, designed to characterize the dogs and cats entering shelters, the population of people relinquishing them, and the reasons for relinquishment.
3. The *Shelter Statistics Study*, created to update a list of all shelters and impoundment facilities in the United States. This instrument continues to collect statistics on the number of animals entering these facilities and their disposition.

This article describes the *Regional Shelter Survey* study. Descriptive statistics addressing questions such as "What are the most common reasons for relinquishment for dogs and cats to shelters?" and "What are the characteristics of people surrendering animals to a shelter?" are presented.

THE REGIONAL SHELTER SURVEY

Shelter Selection

Shelters were selected by principal investigators in four regions. The regional principal investigators were in New York (Cornell University, College of Veterinary Medicine), Tennessee (University of Tennessee, College of Veterinary Medicine), Colorado (Colorado State University, College of Veterinary Medicine and Biomedical Sciences), and California (University of California at Davis, School of Veterinary Medicine). The investigators were selected to use existing resources, giving consideration to geographic diversity, ability, interest, and commitment of investigators.

Role of Investigators

Regional investigators were encouraged to select shelters that were likely to be representative of those in their locations and to attempt to include those from urban, suburban, and rural areas. Selection of shelters was also based on the willingness of shelter administrations to cooperate with data collection. Shelters not routinely euthanizing animals (i.e., "no-kill" shelters) were excluded from the study. Twelve shelters in the United States were selected. They were located in Bergen County, New Jersey (1); New York City (1); Knox and Anderson Counties, Tennessee (2); Jefferson County, Kentucky (2); Denver, Larimer, and Weld Counties, Colorado (3); and Sacramento County, California (3).

A personal interview form was designed to be completed by people surrendering their cats and dogs to animal shelters. The questionnaire, a copy of which is available from the senior author upon request, was reviewed and revised several times by the authors and the Scientific Advisory Committee of NCPPSP prior to field-testing. Field tests were conducted in four shelters in three states before the questionnaire was finalized. Three major categories of questions were included.

Animal Relinquishment

Questions were asked as to the number of animals surrendered and the health status and reason for surrender (i.e., possible adoption, euthanasia).

Owners' reasons. Animal owners were asked their reasons for turning their animal(s) into a shelter.

Recording and coding. Interviewers recorded up to five reasons and then coded them according to the supplied list. Reasons for relinquishment were not prioritized. Sixty-six reasons for relinquishment were developed prior to the onset of interviewing. Five reasons were added during the study.

Animal Information

Early in the interview process, the interviewer categorized the type of animal(s) being relinquished. These categories were:

Individual animals, defined as any animal 6 months of age or older. Owners may have relinquished one or more individual animals.

Litters, defined as animals less than 6 months of age who came from litters known by the person relinquishing the animals. Litters could represent all or part of the litter mates.

Mothers and their litters, defined as all or part of the litter mates.

The following information was collected and organized by each of the categories previously listed:

Animal Demographics-species (i.e., canine or feline), age, gender, neuter status, breed, and purebred status.

Animal Care Information-primary caretaker, frequency of veterinary visits, housing (i.e., indoor vs. outdoor), and level of training (for dogs).

Animal Behavior-12 questions related to animal behavior during the month prior to relinquishment. Owners were asked to choose one of four options ranging from "almost/always" to "rarely/never" that best described the frequency of the behavior(s).

Animal Acquisition Information-source, purchase cost, and length of ownership.

Household Animal Demographics-number of dogs and cats in household, number and source of animals added to the household in the past year, the number of animals lost from the household in the past year, and how these animals were lost.

Human Information

The following information was collected from the individuals who relinquished the animals

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Human Demographics - owner's age, gender, ethnicity/race, income range, state of residence, and education level.

Knowledge Related to the Care and Behavior of Animals-12 "true or false" responses about animal care and behavior to evaluate the owner's general animal behavior knowledge and her or his attitude toward animals.

Fourteen interviewers, not employed by the shelters, participated in an intensive, day-long training session, which included supervised interviews of people relinquishing their dogs and cats to a shelter. They visited their assigned shelters according to a stratified schedule to ensure that all days that the shelter was open, and all seasons of the year, were sampled. Interviewers were instructed to ask those relinquishing a dog, cat, and/or litter of either species to participate in the study.

Limited data were also collected from shelter records on animals relinquished by owners who declined to be interviewed, who were missed because the interviewer was conducting another interview or on a break, or who were too upset to be interviewed. Interviews were conducted in a confidential manner. Information provided by participants could not be linked to individual respondents. Each regional center collected data for a 12-month period, but the 12 months were not strictly concurrent across shelters.

ANALYSIS OF DATA

Data were entered into the computer software program "Epi Info" (Dean et al., 1994) at each center, checked for quality, and forwarded to the coordinating center (Colorado) for merging and analysis. Frequency distributions were computed for animal and human factors. Because the purpose of this article is to describe the study design and its factors, only descriptive statistics are presented. Further analyses related to individual reasons for relinquishment will be presented in future articles.

RESULTS

Study Shelter Demographics

The mean number of animals entering the study shelters was 14,042 per shelter. The mean number of animals exiting the shelters was 9,831 per shelter. The majority (55%) of the exiting animals in each of these shelters were euthanized.

Animal Relinquishment Information

Interviews were conducted and data collected from February 1995 through April 1996. Questionnaires were recorded for 6,929 animals. Thirty-nine percent of the questionnaires were not included in the analysis for the following reasons:

1. 13% of the animals were strays (not owed by those relinquishing them).
2. 8.3% of the animals were brought in while the interviewers were otherwise occupied.
3. 6.1% of the animals were brought in while shelters were closed (after hours).
4. 9.2% of the owners refused to be interviewed.
5. 2.6% of the owners were not interviewed due to emotional stress.

Interviews with 3,772 owners were completed. Those people relinquished 3,676 dogs and litters and 1,409 cats and litters. The 71 reasons for relinquishment were condensed into 12 broad classes (see Appendix). Table 1 presents the proportion of individual dogs and cats who were surrendered for each of these classes as reported by those completing the questionnaire.

Animals of unknown ownership and those submitted for body disposal, euthanasia due to old age or illness, or legal reasons were excluded from further analysis and do not appear in subsequent tables.

Among the top 10 reasons for relinquishment common to both species were: moving, landlord not allowing pet, too many animals in household, cost of pet maintenance, owner having personal problems, inadequate facilities, and no homes available for litter mates. For cats, allergies in family, house soiling, and incompatibility with other pets were among the top 10 reasons stated. For dogs, owners having no time for pet, pet illness(es), and biting were among the top 10.

TABLE 1
Frequency of Classes of Reason for Relinquishment for
Animals in 12 U.S. Shelters (1995-1996)

Class Number	Class Name	Dogs			
		n	%	n	%
1	Aggression toward people	223	9.8	73	5.2
2	Aggression toward animals	178	7.8	97	6.9
3	Behavior-other	654	28.8	297	21.1
4	Requests for euthanasia	364	16.0	165	11.7
5	Animal medical-health	178	7.8	88	6.2
6	Animal characteristics	98	4.3	32	2.3
7	Human housing issues	661	29.1	371	26.3
8	Household animal population	183	8.0	211	15.0
9	Human lifestyle	577	25.4	489	34.7
10	Human preparation-expectation	333	14.6	208	14.8
11	No apparent owner	121	5.3	110	7.8
12	Miscellaneous excluded from analysis ¹	79	3.5	15	1.1
13	No reason given	27	1.2	12	0.9

Note. See Appendix for the specific reasons for relinquishment and their classification. Animals may have up to five reasons listed.

¹Includes DOA, cruelty cases, legal reasons, and body disposal requests.

Animal Information

Table 2 depicts the characteristics of animals surrendered to the study shelters. Equal numbers of male and female dogs were relinquished, but 59% of cats relinquished were female. A greater proportion of cats (51 %) was spayed/neutered at surrender than were dogs (43%).

Upon relinquishment, the neuter status of 2.5% of each species was unknown. Mixed-breed animals accounted for 68% of dogs and 93% of cats; unknown breed status was reported at 2% for both. Thirty percent of the surrendered dogs were classified as purebred. Far fewer cats, however, were classified as purebred (only 6%). Although we gathered data separately for litters, 9% of the individually surrendered dogs were puppies, and 8% of the cats were kittens (less than 5 months of age).

The majority of the surrendered dogs and cats were between 5 months and 3 years of age. Most people surrendering dogs (94%) surrendered a single dog;

TABLE 2
Characteristics of Animals Surrendered to 12 U.S. Shelters (1995-1996)

Characteristics	Dogs		Cats	
	Number	%	Number	%
Age				
Unreported	143	6.6	242	15.5
0-5 months	191	8.8	126	8.1
5 months-3 years	1,023	47.4	629	40.3
3-8 years	409	18.9	352	22.5
>8 years	394	18.2	212	13.6
Sex				
Male	1,010	49.6	552	41.1
Female	1,025	50.4	792	50.9
Neuter status				
Intact	1,110	54.7	628	46.8
Neutered	868	42.8	682	50.8
Unknown	51	2.5	33	2.5
Number of animals relinquished				
1	2,029	93.9	1,298	83.2
>1	131	7.1	263	16.8
Purebred?				
No	1,359	68.4	1,208	92.7
Yes	592	29.8	73	5.6
Unknown	37	1.9	22	1.7
Time animal spent outside				
Always	526	26.8	137	10.7
Sometimes	342	17.4	79	6.1
Seldom	844	43.0	254	19.8
Never	251	12.8	816	63.5

however, 17% of people surrendering cats surrendered more than one cat. Similarly, only 6% of people surrendering dogs surrendered litters, whereas 19% of people surrendering cats surrendered litters. Most dogs and cats had not been bred, according to the person relinquishing them. Twenty-seven percent of dogs were considered "outside" animals. Of the cats, 72% were not declawed, and the majority of the cats (63.5%) were reported to be "indoor" cats.

Of those surrendering litters, 15% of people surrendering young dogs and 33% of people surrendering young cats also surrendered the mother. Thus, the patterns of relinquishment seem to be different for people surrendering young dogs and people surrendering young cats.

Table 3 depicts the information related to animal acquisition and length of ownership. Animals previously owned by friends were relinquished in higher

TABLE 3
Animals Relinquished to 12 U.S. Shelters (1995-1996) by
Source, Length of Ownership, and Purchase Cost

Factors	Dogs		Cats	
	Number	%	Number	
Source				
Breed rescue group	0	0	0	0
Previously owned by family member	0	0	0	0
Abandoned	0	0	0	0
Veterinarian	5	0.2	12	0.9
Other	34	1.6	33	2.5
Gift	62	3	45	3.3
Pet shop	82	3.9	64	4.8
Offspring Of pet	127	6.1	122	9.1
Breeder	226	10.9	46	3.4
Previously owned by manger	219	10.5	70	5.2
Stray	197	9.5	314	23.3
Shelter	475	22.8	193	14.3
Previously owned by friend	653	31.4	446	33.2
Length of Ownership				
Unreported	141	6.5	234	15.0
0-7 months	201	9.3	78	5.0
7 months-1 year	801	37.1	472	30.2
1-2 years	276	12.8	245	15.7
2-5 years	294	13.6	231	14.8
>5 years	447	20.7	301	19.3
Purchase Cost (\$):				
0.00	141	6.5	234	15.0
>0.00	2.01	93.5	1.32	85.0
Mean	48.75		9.67	
Median	0		0	
Mode	0		0	

numbers than animals from any other source. The next most common sources for dogs was from shelters, followed by breeders, previously owned by strangers, and strays. For cats, the next most common category source was stray, followed by shelters, and offspring of a cat they owned. The mean purchase cost for dogs was \$48.75; 6.5% were obtained at no cost. Cat owners spent an average of \$9.67; 15% were obtained at no cost. Forty-six percent of the dogs and 35% of the cats surrendered had been owned for less than a year.

Table 4 depicts additional information about relinquished dogs and cats and the households from which they came as specified by the owners. The majority of both dogs and cats lived in a multiple pet household; however, only 24% to 45% of the other pets had been obtained within the last year. Fifty-eight percent of the dogs and 65% of the cats lived with another animal of the same species.

Table 5 presents the characteristics of litters and dams with litters that were relinquished during the study period. On 22 occasions, a mother dog and her litter were relinquished; this occurred 85 times with a mother cat and her litter. In general, dog litters were older than cat litters, while the distribution of ages of mothers was similar for both species. The majority of litters and dams were not purebred.

Table 6 depicts the relative frequency of the animals' problematic behaviors as reported by the owner. Most frequently (from 46% to 90%) owners claimed that the surrendered animals rarely or never demonstrated any of the problem behaviors listed during the month prior to surrender. All of the undesirable behaviors described in the questions were reported as having occurred by at least some owners. The undesirable behaviors were reported to occur at some level-11% (attacked other animals) to 53% (hyperactive)-by owners relinquishing dogs, and 11% (escaped) to 44% (acted fearful) by owners relinquishing cats. Twelve percent of dogs and 9% of cats being relinquished were reported to have bitten a person.

Human Information

Table 7 presents the characteristics of owners who relinquished dogs or cats. Forty percent of respondents declined to report his or her age. Approximately equal numbers of males and females relinquished dogs, but more women than men relinquished cats. In general, people relinquishing cats had lower income levels than those relinquishing dogs, but were more likely to have reached education levels above high school.

Table 8 presents responses to general knowledge questions of dogs and cats and owner beliefs about animal behavior. Twelve percent of the people surrendering dogs and 10% of the people surrendering cats believed that behavioral differences between breeds of dogs do not exist. An additional 6% and 10% of people surrendering cats and dogs, respectively, did not know if behavior differed by breed.

Fifty-three percent of people surrendering dogs and 58% of people surrendering cats believed that animals will misbehave out of spite; approximately 10% more of

TABLE 4
 Animal Information as Reported by Owners at
 Relinquishment in 12 U.S. Shelters (1995-1996)

Factors	Dogs		Cats	
	Number	%	Number	%
Service requested				
Adoption	2,375	72.1	1,682	78.6
Euthanasia	733	22.2	371	17.3
Body disposal	49	1.5	19	0.9
Return to owner	67	2.0	14	0.7
Other	72	2.2	63	2.5
Health status				
Healthy	2,059	94.4	1,471	95.5
111	36	1.9	20	1.5
Poor condition	79	4.1	32	2.3
Other	55	2.8	45	3.3
Animal was to a veterinarian				
No	763	33.0	572	46.9
Mean yes responses	1.4		1.0	
Training				
By owner only				
Yes	1,421	62.5	NA	NA
No	852	37.5	NA	NA
Trained when obtained				
Yes	342	15.1	NA	NA
No	1,927	84.9	NA	NA
Obedience classes				
Yes	90	4.0	NA	NA
No	2,177	96.0	NA	NA
Professionally				
yes	27	1.2	NA	NA
no	2,239	98.8	NA	NA
Private lessons				
yes	29	1.3	NA	NA
no	2,237	98.7	NA	NA
None				
yes	620	27.2	NA	NA
no	1,658	72.8	NA	NA
Had not had another dog added to household	1,671	64.7	1,357	71.3
For those who had added dogs				
Mean	1.8		1.7	
Median	1.0		1.0	
Had not had another cat added to household	1,924	75.9	1,044	55.4
For those who had added cats:				
Mean	1.8		2.9	
Median	1.0		2.0	
Did not live with another dog	1,671	41.9	1,357	46.1
Did not live with another cat	1,924	48.3	1,044	35.5

TABLE 5
 Characteristics of Litters and Mothers with Utters Relinquished
 Together in 12 U.S. Shelters (1995-1996)

Characteristics	Dogs*				Cats*			
	Dam		Litter		Dam		Litter	
Number	%	Number	%	Number	%	Number	%	
Age								
0-5 months	1	4.5			1	1.2		
5 months-3 years	17	77.3			67	78.8		
3-8 years	3	13.6			16	18.8		
>8 years	1	4.5			1	1.2		
Age (days)								
Unreported			5	3.7			12	4.0
0-21			1	0.7			4	1.3
22-28			2	1.5			9	3.0
29-42			24	17.6			50	16.7
43-90			85	62.5			194	64.9
91-120			11	8.1			12	4.0
>120			8	5.9			18	6.0
Mean			78.5				67.4	
Purebred?								
No	18	81.8	125	94.0	85	98.8	289	99.7
Yes	4	18.2	8	6.0	1	1.2	1	0.3

*N= 136. N= 299.

TABLE 6
 Behaviors of Animals as Reported by Owners in 12 U.S. Shelters (1995-1996)

Factors Level	Dogs		Cats	
	Number	%	Number	%
Soils in house				
Always	147	7.5	57	4.4
Mostly	125	6.3	72	5.6
Sometimes	364	18.5	175	13.6
Rarely/never	1,335	67.7	986	76.4
Damage to house				
Always	144	7.3	25	1.9
Mostly	147	7.5	60	4.6
Sometimes	431	21.8	226	17.5
Rarely/never	1,251	63.4	980	75.9

(Continued)

TABLE 6 (Continued)

Factor Level	Dogs		Cats	
	Number	%	Number	
Hyperactive				
Always	289	14.7	63	4.9
Mostly	306	15.5	115	8.9
Sometimes	473	24.0	250	19.3
Rarely/never	903	45.8	864	66.9
Was too noisy				
Always	99	5.0	31	2.4
Mostly	179	9.1	67	5.2
Sometimes	575	29.2	242	18.7
Rarely/never	1,119	56.7	951	73.7
Acted fearful				
Always	92	4.7	79	6.1
Mostly	121	6.2	129	10.0
Sometimes	395	20.1	354	27.4
Rarely/never	1,358	69.1	729	56.5
Growled at people				
Always	28	1.4	10	0.8
Mostly	61	3.1	27	2.1
Sometimes	235	11.9	135	10.4
Rarely/never	1,646	83.6	1,123	86.7
Growled at animals				
Always	66	3.4	27	2.1
Mostly	64	3.3	51	4.0
Sometimes	270	13.8	196	15.3
Rarely/never	1,561	79.6	1,007	77.8
Attacked animals				
Always	21	1.1	8	0.6
Mostly	47	2.4	26	2.0
Sometimes	150	7.6	126	9.9
Rarely/never	1,745	88.9	1,116	87.5
Escaped				
Always	71	3.6	22	1.7
Mostly	88	4.5	25	2.0
Sometimes	259	13.3	90	7.1
Rarely/never	1,53	78.6	1,132	89.2
Bitten someone				
No	1,725	88.1	1,066	91.1
Yes	233	11.9	104	8.9
Scratched someone				
No	NA	NA	1,048	84.0
Yes	NA	NA	200	16.0

TABLE 7
 Characteristics of People Relinquishing an Animal to 12 U.S. Shelters (1995-1996)

Characteristic	Dogs		Cats	
	Number	%	Number	%
Age (years)				
Unreported	1,573	39.5	1,179	40.1
<21	172	4.3	124	4.2
21-30	578	14.5	436	14.8
31-40	790	19.8	558	19.0
41-50	480	12	297	10.1
51-60	217	5.4	166	5.6
>60	175	4.4	181	6.2
Mean	38.3		38.8	
Gender				
Male	1,550	51.1	900	40.1
Female	1,486	48.9	1,347	59.9
Ethnicity				
Latina/Latino	360	39.5	232	11.3
Caucasian	1,998	71.6	1,560	76.2
African American	283	10.0	174	8.5
Asian American	84	3.0	35	1.7
Native American	39	1.4	18	0.9
Other	28	1.0	28	1.4
Highest Level of Education Reached				
8	286	12.3	180	10.4
9-12	827	35.5	599	34.7
>12	1,215	52.2	946	54.8
Income level (\$/year)				
<12,499	351	16.7	292	18.7
12,500-19,999	248	11.8	228	14.6
20,000-27,499	334	15.9	239	15.3
27,500-34,999	349	16.6	238	15.3
35,000-44,999	316	15.1	238	15.3
45,000-74,999	357	17.0	216	13.9
75,000-124,999	118	5.6	77	4.9
125,000	26	1.2	31	2.0

TABLE 8
 Owner Beliefs About Animal Needs and Behavior as
 Reported to 12 U.S. Shelters (1995-1996)

<i>Belief</i>	<i>Dogs</i>		<i>Cats</i>	
	<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>
Animals need vaccinations or may become ill				
False	63	2.7	72	4.2
True	2,237	96.1	1,616	93.8
Don't know	28	1.2	35	2.0
Dogs can come into heat about twice per year				
False	165	7.1	129	7.5
True	1,423	61.3	899	52.3
Don't know	734	31.6	692	40.2
There are no behavior differences between breeds				
False	1,917	82.6	1,381	80.4
True	273	11.8	164	9.6
Don't know	130	5.6	172	10.0
Animals misbehave out of spite				
False	859	37.0	553	32.2
True	1,229	53.0	1,003	58.3
Don't know	231	10.0	163	9.5
You need to catch an animal misbehaving to correct it				
False	329	14.2	247	14.4
True	1,897	82.0	1,365	79.6
Don't know	88	3.8	103	6.0
Cats can come into heat about twice per year				
False	265	11.5	425	24.8
True	484	20.9	599	34.9
Don't know	1,565	67.6	69	40.4
Rubbing nose in messes is effective discipline				
False	1,237	53.5	869	50.6
True	788	34.1	498	29.0
Don't know	287	12.4	350	20.4
Animals are better off having a litter before being spayed				
False	873	37.8	777	45.3
True	566	24.5	379	22.1
Don't know	870	37.7	559	32.6
Cats don't mind sharing a house				
False	1,016	44.0	1,059	62.0
True	375	16.3	384	22.5
Don't know	916	39.7	265	15.5
Cats bite or scratch as a form of play				
False	84	3.6	93	5.4
True	1,862	80.6	1,588	92.6
Don't know	365	15.8	34	2.0
It costs >\$100/year to maintain a pet				
False	76	3.3	86	5.0
True	2,178	94.3	1,572	91.7
Don't know	55	2.4	56	3.3

both types of surrenderers did not know. This large percentage may contribute to owner misconceptions about the reasons for behavior problems as well as their inappropriate ways to try to resolve behavior problems. Similarly, 14% of people surrendering animals believed an animal does not need to be caught in the act of misbehaving to punish it; 34% and 29% of people surrendering dogs and cats, respectively, thought that rubbing the animal's nose in its mess would help to house train it.

Nearly a quarter of dog owners and slightly greater than one fifth of cat owners believed that a female dog or cat should have one litter before being spayed. In general, 38% to 48% of the owners did not know that bitches could come into heat about twice a year. This lack of knowledge was greater for owners relinquishing cats compared to those relinquishing dogs. Similarly, 65% to 79% of owners answered "false" or "don't know" to questions about the frequency of heat in cats. Because cats are seasonally polyestrous, owners may have been confused by this question, but both questions demonstrate a serious lack of knowledge about the reproductive cycle of dogs and cats.

DISCUSSION AND CONCLUSION

An earlier study of 13 shelters in eight states found that most dogs relinquished to shelters initially were obtained from family or friends at no charge and had most likely been relinquished either because of lifestyle changes, such as moving, or because of behavior problems (Arkow & Dow, 1984). This is consistent with our findings. Behavior problems were reported for 26% of the dogs being surrendered, which is close to the 25% figure found by one of the authors (Hetts) based on data from a large metropolitan shelter.

A more recent study of a single shelter in Ohio also found that most dogs (54%) and cats (47%) being relinquished had been obtained from a private owner (Miller, Staats, Partlo, & Rada, 1996). More than two thirds of these animals were younger than 2 years of age.

Identifying Factors

To identify factors that may put animals at risk for relinquishment, two studies have, for the first time, compared characteristics of owners and the animals they relinquished to a random sample of current pet owners and their pets in one county (Patronek et al., 1996a, 1996b). Dogs at increased risk for surrender were sexually intact, obtained at little or no cost, older than 6 months when obtained, spent most of the day in a yard or crate, and were more work than expected. Dogs were more likely to be perceived as more work if they were sexually intact, exhibited frequent problem behavior, and were obtained from an animal shelter.