



## Research

## An owner survey of toys, activities, and behavior problems in indoor cats

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## ABSTRACT

The objective of this study was to survey the owners regarding the frequency and duration of their daily interactions with their indoor cats, the provision of toys and activities by the cat owners, and the prevalence of 6 selected behavior problems (aggression to owner, aggression to visitors, periuria, inappropriate defecation, inter-household cat aggression, and intercat aggression to outdoor cats). The sample population was 277 clients from 5 veterinary practices who presented their domestic cat for anything except a behavior problem. The average number of toys and activities reported by owners per cat was 7, and the most common toys/activities used by owners in this survey were furry mice (64%), catnip toys (62%), and balls with bells (62%). A total of 78% of the owners reported that they leave the cat's toy(s) available all the time. All owners reported playing with their cat, whereas most owners (64%) played with their cat more than 2 times per day and reported play bout durations of 5 (33%) or 10 minutes (25%). Owners who reported play bout time of 5 minutes or more reported fewer behavioral problems than those with play bouts of 1 minute ( $P < 0.05$ ). A total of 61% of the owners reported that their cat engaged in 1 or more of the 6 selected behavior problem(s), but only 54% of the owners who reported behavior problems in their cats reported that they had talked to their veterinarian about the problem. The 2 most frequently reported behavior problems were aggression to the owners (36%) and periuria (24%). Female cats were 50% less likely to be reported to have 1 or more behavior problems than males despite an equal sex distribution in the survey population ( $P < 0.05$ ). The relationship between individual behavior problems and individual toys and activities was evaluated by use of a logistic stepwise regression. These findings are discussed as they relate to the understanding of behavioral needs of indoor-housed cats and the potential role of environmental enrichment in the home setting.

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## Introduction

Research suggests that feline behavior problems are one of the most common reasons for cats to be removed from a home. An estimated 10–28% of the cats that are surrendered to an animal shelter are reported to be relinquished because of behavior problems (Kass et al., 2001; Patronek et al., 1996; Salman et al., 1998, 2000). The most frequent behavior problems reported at relinquishment are house soiling, inter-pet problems, and aggression toward humans (Patronek et al., 1996; Salman et al., 2000).

Cats that are kept indoors a portion of the time are less likely to be relinquished than cats that are kept outdoors (Patronek et al., 1996). In an effort to increase life spans, minimize predation by cats on birds, and decrease shelter relinquishment, animal professionals advise that domestic cats be kept indoor (AVMA's Animal Welfare Position, 2014 and Humane Society of the United States Safe Cats Program, 2005). It has been reported that 35% of the owners keep their cats indoors all the time (American Bird Conservancy Cats Indoors!, 1997), 56% keep their cats inside at least part of the day (American Pet Products Manufacturers Association 2003–2004 National Pet Owners Survey), and 2 of every 3 veterinarians encouraged owners to keep their cats indoors (Humane Society of the United States, 2005). Although disease risks have been evaluated for indoor cats, (Buffington, 2002), evaluation of the behavioral wellness of an indoor cat has not been adequately addressed. In comparison with the outdoor environment, an indoor

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environment is often predictable and unchanging, which may result in stress and inactivity in the indoor cat (Rochlitz, 2005). An important element in the assessment of behavioral wellness of indoor cats is information on what owners currently provide as enrichment for their indoor cats and to evaluate their benefit.

Enrichment is defined as modifications and interventions to the environment that benefit the inhabitants. This can be accomplished through provision of physiological needs (such as food, water, and shelter), identifying and meeting behavioral needs (both species- and individual-specific), providing environmental complexity, and offering opportunities to fulfill exercise requirements. Ideally, enrichment would simulate the natural activities of the animal, allow the animal to make choices, and be guided by information regarding the animal's activity budgets in the natural environment (Mellen and MacPhee, 2001; Mench, 1998) and its species-specific requirements (Van de Weerd et al., 2003).

Beneficial behavioral effects of enrichment have been shown in felids in laboratory and zoological settings. Provision of live fish or intact carcasses in captive small felids decreased stereotyped pacing and increased exploratory behavior (Bashaw et al., 2003; MacPhee 2002; Shepherdson et al., 1993). Pacing and cortisol levels were reduced in leopards when they were provided places to hide (Carlstead et al., 1993). Although many more enrichment techniques have been evaluated in captive animals, the relationship of enrichment and behavior has not been fully evaluated in the pet domestic cat. It has been suggested that enrichment is likely to be beneficial to the domestic cat in the home (Overall, 2004; Virga, 2002) and has been recommended as a need for the cat as part of a healthy environment (Ellis et al., 2013).

The goals of this survey study with owners of pet domestic cats were: (1) Identify the frequency and duration of owners' daily interactions with their indoor cats, (2) Identify toys and activities currently provided by owners for their indoor cats, (3) Identify the prevalence of 6 selected behavior problems of indoor cats, (4) Identify whether the owners consulted their veterinarians regarding behavior problems, and (5) Evaluate for a relationship between number of owner-provided toys and activities and behavior problems.

## Materials and methods

### Case households

This was an observational study that used a non-probability, convenience sample design. Surveys were distributed to clients of 5 small animal veterinary hospitals in northeast Tennessee by a non-veterinarian hospital staff member. In an attempt to evaluate a population of cats with no-to-minimal behavior problems, clients were selected if the cat they had with them was being presented for anything other than a primary behavioral complaint. Surveys from owners were included in the analysis if the cat spent at least a portion of its time indoors and the cat used a litter box at least part of the time. This inclusion factor was designed to exclude cats that would not have access to owner-provided toys and activities and to evaluate litter box usage for a later study. Clients were instructed to complete the survey for the cat with them that day. The client received a cat toy (fishing pole toy) after filling out the survey.

### Survey design

The survey was 6 pages in length and is included in Appendix A. Participants had an opportunity to add any additional comments and to provide their contact information for information regarding results of the study.

A pilot study consisting of 25 participants was conducted to evaluate clarity of questions and used open-ended questions to

determine typical responses regarding toys and activities. The test survey was adjusted based on the pilot study.

### Statistical analysis

Descriptive statistics were generated by use of a personal computer program (Minitab Release 14.1 Statistical Software, Minitab Inc., State College, PA). Summary statistics (means, medians, and standard deviations) were calculated for all binary variables. Correlations were calculated for continuous variables. Analysis of variance was performed for parametric samples, and univariate chi-squares were performed for individual enrichment regarding behavior problems.

Multivariate analyses were performed using a logistic stepwise regression model (technique of Furnival and Wilson, 1974) for each type of behavior problem with individual toy or activity. Level of significance was set a priori at  $P < 0.05$ . Odds ratios (ORs) were calculated using EpiInfo Version 3.2.2 (Centers for Disease Control, Atlanta, GA).

## Results

### Survey completion rates

A total of 350 surveys were distributed over a 6-month period and 283 were returned. Six surveys were excluded either because the cat was completely outdoors or because the survey was not fully completed. The total number of surveys analyzed was 277 (79% of 350).

### Demographic characteristics of the cat population

The population of cats as reported in the surveys was equally distributed between males and females. The age of the cats ranged from 6 weeks to 18 years of age, with an average of 5 years of age. Most cats were reported to be neutered (81%), and there was no significant difference between males and females on reported neuter status. A total of 29% of the cats were reported to be declawed, with no significant difference between males and females on reported declaw status. A total of 63% of the cats were reported to be indoors 100% of the time, with a range from 5% to 100% of the time. Females were reported to be kept indoors on average 93% of the time, whereas males were reported to be kept indoors on average 88% of the time ( $P = 0.03$ ). The average number of cats in the home was slightly greater than 2 (2.19), with a range from 1–14 cats in the home. The responses are summarized in Table 1.

### Play-related behaviors

All owners reported that they played with their cat at least once a month. Owners reported most often that they played with their cat more than twice a day (64% of owners). About 4% of the owners reported that they played with their cat once a week, 5% played with their cat twice a week, 17% reported that they played with their cat once a day, and 9% reported that they played with their cat twice a day. When owners were provided 6 choices of play bout duration (Appendix A), owners reported most often that they played with their cat for 5 minutes (33%) or 10 minutes (25%) per play bout (Figure 1). A total of 78% of the owners reported that they leave the cat's toy(s) available all the time.

### Toys and activities

The average number of toys and activities provided per home was 7.72 (range, 0–20; Table 2).

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