

Investigation on Identifying Difficulties Related to Isolation in Household Cats

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Abstract

Recognizing and avoiding separation-related problems (SRP) in companion animals has an impact on animal wellbeing and the strength of human-pet bonds. An assortment of behavioral and physiological signs known as the SRP are shown when an animal is separated from its attachment person. Therefore, the purpose of this study was to develop a survey for cat owners that would aid them in recognizing SRP symptoms and to determine if there was a correlation between the frequency of SRP and the cats' management practices. We looked at the correlations between SRP and feline personality qualities, as well as those of their owners, their environments and their managers. Concurrent conventional and molecular testing was performed on samples taken from 118 adult cats that did not have otitis externa. Out of the 118 animals that were examined, 59 of them, or 14% of the total, displayed one or more of the actions that were used to calculate SRP. The majority of the reported behaviors among the cats under study (23.73%, 14/59) were destructive. Depressive apathy (27.12, 16/59), excessive vocalization (32.20%, 19/59), aggression (15.25%, 9/59), agitation anxiety (16.95%, 10/59) and, less frequently, elimination issues (feces) (28.81%, 17/59) were the following most common behaviors. It might be challenging to identify separation anxiety in domestic cats since there is a shortage of information on the condition. This study's questionnaire might serve as a foundation for future studies by assisting in the identification of the primary behaviors in cats that are likely associated with SRP.

Keywords: Separation-Related Problems (SRP), Household Cats, Feline Calicivirus (FCV), Multiple Correspondence Analyses (MCA)

INTRODUCTION

The domestic cat, one of the most beloved pets in the world, is handled by people in a wide variety of ways and lives in several environments. Depending on their chosen path in life, cats can experience a wide variety of settings and challenges, from roaming freely outdoors that are confined in reforming centers or even living in someone's house. Available space and resources, as well as the kind and level of social interactions with humans and other species, can differ between these contexts (1). An extraordinary degree of social flexibility is on display among the domestic cat species, allowing individuals to live either in social groupings with other cats or other animals or alone. Some cats, on an individual level, can go through many generations or even one lifetime with different lifestyles and corresponding levels of sociality. A housecat that lives alone can decide to join a colony of other feral felines instead of staying set in a domestic setting (2). With over 100 million cats in North American households, it's clear that cats are a popular choice for companion animals. A growing number of humane groups in the United States and Canada have issued statements warning cat owners against letting their pets wander freely outside in recent years (3). This recommendation is based on the fact that cats' wellbeing can be affected by uncontrolled outdoor access for a

number of reasons, including but not limited to increased vulnerability to disease transmitted by other animals, increased risk of death or injury due to vehicle collisions and increased risk of predation by other animals. A lot of people are worried about the damage that cats do to their local ecosystems and some even think they're noisy and disruptive to human neighbors (4). It has been proposed that cats benefit from access to the outdoors in many ways despite the fact that there are several possible welfare hazards connected with unrestricted outside access for cats. For instance, some argue that cats benefit from more mental stimulation in outdoor settings due to the abundance of natural enrichment and room for exploration. In contrast, others worry that confined cats are more likely to experience boredom, frustration and behavioral issues due to a lack of opportunity to engage in their natural behaviors like climbing, hunting and exploring (5). Cats have more room to run, leap and explore when they have access to the outdoors, which some believe improves their health. Animal shelters and study catteries have been the primary settings for the majority of studies examining the effects of domestic cats' environments on their health and happiness (6). Several writers in recent years have voiced their worry that the requirements of domestic cats kept in homes by private individuals are unmet. According to a number of studies, a lot of cat owners don't know the basics of cat care, such as how to keep their cats healthy, how to avoid having litters they don't want, or what kind of atmosphere is best for cats (7). Given that many cat owners are unable to interpret their feline friends' nonverbal cues properly; this can be a major problem for felines' behavioral requirements. The habitats of many cats have changed due to the rise in urbanization. As a result, people tend to live in smaller apartments with greater population densities and spend more time alone, all of which might make domestic cats feel more stressed out (8). Physical, physiological and behavioral symptoms of stress can manifest in a wide variety of ways. There have been observations of targeted and non-target behaviors, such as item damage, efforts to escape, excessive salivation and vocalization, or improper urine and feces (9). Because these signals emerge in very different ways for different people in terms of dynamics, timings and signal strength, there are many unsolved questions. For instance, although some afflicted cat destroys things while their owners aren't around, others don't exhibit any destructive behavior. Many other feelings and reasons, including anxiety, are thought to be at the root of SRPs (10).

The study (11) described domestic cats as infected with the extremely infectious feline calicivirus (FCV), which shows a high level of genetic polymorphism and it is resistant to several disinfectants. Serious or even deadly infections might result from FCV infection. In homes with several cats, FCV infections can be very troublesome. Cats infected with FCV can develop severe mouth erosions, moderate upper respiratory illness and potentially deadly pneumonia, especially in kittens. An infection might accompany persistent gingivostomatitis. In sporadic cases, very dangerous FCV variations can cause widespread illness, epizootic spread and significant fatality rates. The study (12) describes that social separation is known to elicit a response from domestic cats. The theoretical basis for the correlation between separation-related behaviors in non-clinical settings remains poorly understood. A single construct is associated with separation; rather, they observed the emergence of several motivational states. Ethological classifications should be improved in future research by evaluating behaviors associated with separation in a multi-measure setting. The study (13) aimed to understand how cat owners perceive their pets' behavior and to identify certain actions that owners deem harmful. This research sought to understand how cat owners perceive their pets' behavior and to identify certain actions that owners deem harmful. The study (14) examined the relationship between canine behavior changes and variables, including owners' routines and the amount of time they spent at home. In a survey that was conducted over eight months, the respondents were questioned about their work routines, how they managed their dogs and the way their dogs behaved. A variety of separation difficulties were shown to be more common in animals with a history of warning indications, such as vocalization, self-injury, or gnawing to escape confinement, according to generalized linear models. The study (15) determined that cats in home settings have not been the primary focus of most research, which has taken place in specialized settings like labs or shelters. Furthermore, whereas the majority of research has measured cortisol levels in cats to determine physiological stress situations, no studies have quantified positive signs like oxytocin. To determine what variables impact hormone

levels, owners filled out surveys on their living conditions, specific cat details and how they interacted with their cats each day. The derived principal component scores for everyday interactions using principal component analysis. The study (16) described that the use of citizen science, which comprises public participation in research endeavors, is on the rise in the field of animal behavior studies. Two citizen science data collection methodologies for examining cat-cat interactions were compared and contrasted in this review using Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis: examines online survey responses and caregiver-recorded home videos. The article (17) summarized the experts in the field currently know about the difficulties that might arise when dogs are left alone. In subsequent sections, they will explore several methods of behavioral modification that can assist dogs while their owners are not around. The phrase "separation anxiety" has fallen out of use and veterinarians no longer assume that an overly strong attachment between dog and owner is the root cause of separation issues. The study (18) proposed anxieties, destructiveness and improper defecation are common symptoms of operation-related illnesses in dogs, which might make them act out in times of caregiver absence or imagined absence. Natural remedies abound for many canine behavioral problems, but there is less proof that any of them really work according to veterinary standards. The study (19) domesticated animal cats that stand out for their remarkable evolutionary trajectory from lonely ancestors to one of the most popular and cherished home pets today. Curiously, the feline's anatomy and senses are almost indistinguishable from those of wild cats. The perceptual characteristics can provide light on the domestic cat's behavior in relation to its surroundings and its interactions with its social partners. Undoubtedly, the most impacted part of a cat's life during domestication is its social life. The paper (20) included multiple linear regressions, moderation and (moderated) mediation studies to evaluate associations in a sample of people who owned cats and dogs. Using pet type as the moderator, a moderated mediation analysis was conducted to explore the differences between owners of cats and dogs. The results show that dog owners are more likely to see their dogs as human than cat owners.

MATERIALS AND METHODS

The experiment intends to identify potential adverse effects of isolation on domestic cats' health by tracking their behavior, looking for signs of stress and studying their physiological reactions. The findings of this study add to the knowledge of feline psychology and might guide efforts to improve indoor cats' living circumstances, which would benefit their emotional and physical wellbeing.

Data set

Of the total 118 cats, 51 (43.22% of the total) were males and 67 (56.78%) were females. In this investigation, they collected samples from local Indian cat breeds. Cats have a special combination of independence and devotion, which adds to their mysterious allure. Their slick fur, keen senses and exquisite agility make them excellent hunters, but they are good at enchanting partners. Through their mesmerizing purrs and mischievous antics, cats establish profound bonds with people, bringing them much pleasure and solace. They build nests of comfort and they are quite possessive of their territory.

Questionnaires

There were a total of 77 questions spread out over the questionnaire's five sections: (I) inclusion criteria (5 questions), (II) Characteristics of the participant (nine questions), (III) the allocation and supply of resources (3 questions), (IV) information about cats, their health, behavior along with their interactions with one another (21 questions) as well as (V) 11 videos showing different interactions between two cats, with participants asked to rate the quality of each video's interaction and the frequency with which they observe similar behaviors in their cats (36 questions). Sections I-IV of the questionnaire is given in this study; part v is omitted. The demographic questions

that were asked of the participants included their age (19-39, 40-49, 50-59, 60-69, 70-79, 80+, Would instead not mention it, but everyone above the age of 18), gender (female, male, rather than say, non-binary, other), estimation of their expertise in the field of feline behavior (to some extent, significantly, not at all, moderately, extremely) and whether they had any prior experience working with companion cats. To comprehend the cats' household, they asked about the following: the total number of adults (defined as those aged 19 and above; numerical entry), children (defined as those aged under 19; numerical entry), dogs (1, 2, 3, 4, 5+) and the size of the household (<600 sq ft, 600-2,000 sq ft, 2,000-2,500 sq ft, >2,500 sq ft, prefer not to answer). Information specific to cats is requested for each one, including their names, whether they have declawed all four paws or just the front or back, if not sure where they were acquired (from a breeder, a pet store, a shelter or rescue, a family member, a neighbor, a friend, a purebred, a domestic, a thoroughbred mix, or from a previous litter) and what kind of coat pattern they have (tabby, tortoiseshell, bi-color, solid, calico, other). The following fields must be filled out: skin color (choose all that apply: brown, black, beige, lavender, gray, white, orange, red), sex (female spayed, not sure, male neutered, female intact), current age (numerical entry), years since introduction to the home (< 2 years, 2-4 years old, 5-7 years old, 8-11 years old, >11 years old), outdoor access (inside with close supervision of outside activities, used inside, indoors with unattended access to the outside) and present or past health along with behavioral issues. A Likert scale with five points graded respondents' connection to their cats and the mental state of their initial communication: adverse, unfavorable, moderately positive, extremely favorable, or already acquainted. Cats' living period (<2 years, 2-4 decades, 5-7 years, 8-10 years, 11+ years), relatedness cousins, mom and children, dad along with kids, as well as closeness were addressed.

Data Analysis

The data from the questionnaire was analyzed descriptively by classifying the answers and calculating their frequencies. The following criteria were used to classify cats as potentially suffering from SRP after an analysis of the frequency of actions and emotional states that are suggestive of the disorder: I) cats whose owners reported at least two indications of SRP, including improper urine or feces placement, destructive behavior, excessive vocalization, or both; III) cats whose owners experienced SRP-related aggression, despair and agitation-anxiety as well as (IV) cats whose owners stated that their cats exhibited at least one positive behavioral category and at least one evaluated emotional condition. The SRP group consisted of cats that were allocated to one or more of the authors' criteria. SRP was linked to owner attributes, environmental conditions and leadership traits in multiple correspondence analyses (MCA), confirming the interconnectivity of the factors. MCA is a great exploratory multivariate approach for categorical survey findings. With this multivariate approach, they can examine the interplay between categories of variables represented by "clouds" of dots in a two-dimensional space all at once. By evaluating the correlations between the variables at various levels, MCA reveals the nature of the interactions between them. Inertia is a measure of data dispersion with regard to independence that is used to quantify variance. As a collection of correlations or the connection between the variables in the rows and columns, point proximity can be seen as one perspective.

RESULT

Issues with behavior and the prevalence of SRP

59 out of 118 cats were included in the research because their owners met one of the three requirements used to characterize SRP. Of these, 32 respondents (including two that were SRP-qualified) owned the cats. Based on the criteria, 46.07% (26 out of 59) were satisfied (meaning they had a positive reaction to at least one behavior and at least one emotional state); 11.86% (7 out of 59) were content (owners experienced three symptoms of SRP in their minds) and 33.89% (20 out of 59) met the first requirement, which required them to acknowledge doing two or more

things that point to SRP. Additionally, 8.47% of the felines met all three criteria, whereas 37.29% of the overall animals met both I and II. 118 people in total had their behavioral and emotional indications; the most common of these was sadness when the owner was away. Improper urinary removal, irritability and increased vocalizations were further symptoms. Appropriate defecation took place on the main suite flooring and mattress, parts of the sitting room's furnishings, carpeting, couches, flower vessels, clothing, kitchen sinking and the area next to the floor plumbing. The incidence of the behavioral traits indicative of SRP was more significant in the SRP subgroup compared to the entire population of cats, as shown in Table (1). The most common symptoms observed in these cats were incontinence, hyperactivity, restlessness, depression-apathy, aggressiveness and disruptive activity, causing harm ranked second, with loud vocalizations third.

Table (1). Issues with behavior and the prevalence of SRP

(Source: author)

Behavioral/Emotional Signs SPR	SRP (n=59)	Non-SRP (n=59)	Total (n=11)
Excessive Vocalizations	32 (54.24)	19 (32.20)	14 (11.86)
Elimination problems (faces)	50 (84.75)	17 (28.81)	32 (27.12)
Depression-apathy	22 (37.29)	16 (27.12)	7 (5.93)
Destructive behavior	49 (83.05)	14 (23.73)	41 (34.75)
Agitation-anxiety	20 (33.89)	10 (16.95)	10 (8.47)
Aggressiveness	36 (61.02)	9 (15.25)	26 (22.03)
Elimination problems (urine)	7 (11.86)	8 (13.56)	3 (2.54)

Note: Behavioral and emotional signs of SRP in the populations that were sampled are shown below, along with their relative and absolute frequency (in percentages including the standard deviation): cats afflicted with SRP, cats unaffiliated with SRP and the whole population.

The prevalence of SRP and other demographic factors affecting the cat population

The cats' ages ranged from six months to sixteen years, with an average of 4.0 ± 4.5 years. The presence of SRP was not associated with any of the cats' traits, including gender, age, neutering status or breed, as shown in Table (2), with the exception of the amount of time spent with the owner ($P = .03$, $\chi^2 = 9.23$).

Table (2). The prevalence of SRP and other demographic factors affecting the cat population

(Source: author)

Cat Characteristic	SRP (n=59)	Non-SRP (n=59)	Total (n=118)	P-Value	X ²
Age (years)				0.18	4.86
0.6 to 1.0	14	16	29	-	
1.1 to 4.0	11	9	10	-	
4.1 to 8.0	12	15	23		
≥8.1	22	20	56		
Sex					
Male	32	26	55	0.43	-

Female	27	33	63		
Establish into					
Genuine	46	16	60	0.78	-
A hybrid animal	13	43	58		
Time with the owner (years)				9.23	0.03
0.6 to 1.0	10	23	45		
1.1 to 4.0	23	6	12		
4.1 to 8.0	12	20	50		
≥8.1	14	10	16		
Had been Sterilized				0.22	-
Yes	40	37	70		
No	19	22	48		

Note: percentages of feline traits in the three research groups: those with SRP symptoms, those without and the overall population.

The relationship between the traits of owners and the prevalence of SRP

Most houses had two or three people living in them, although the number of residents might be anything from one to seven. The number of females in the home was associated with the prevalence of SRP when considering the characteristics of the occupants ($P = .01$, $\chi^2 = 12.37$). Table (3) shows that the majority of the studied houses had one female resident. The owners' ages varied from eighteen to seventy-five, according to the poll. According to Table 3, there is a connection between the frequency of SRP and other ownership attributes, such as gender, number of tenants and percentage of male residents.

Table (3). Relationship between the traits of owners and the prevalence of SRP

(Source: author)

Owner Characteristic	SRP (n=59)	Non-SRP (n=59)	Total (n=118)	P-Value	X ²
Age (years)				0.21	3.07
19 to 35	26	11	50		
37 to 60	12	18	50		
≥61	21	30	18		
Sex					
Female	67	32	60	1.00	-
Male	51	22	58		
Female population in the area					
None	12	23	56		
1	22	10	23		
2	14	14	10	12.37	0.04
3 to 5	11	12	29		
Count of people living in the home				0.979	0.61
1	11	21	10		
2 or 3	12	12	8		

4 to 7	37	26	100		
The male population in the area				4.30	0.17
None	3	30	-		
1	36	12	70		
2	20	17	48		

Note: The survey's owner characteristics, both for the cats with and without SRP symptoms, were subjected to a quantitative and qualitative analysis.

Research on the correlation between environmental or managerial factors and the incidence of SRP

Playing with toys was shown to be associated with the prevalence of SRP among the environmental variables evaluated ($P=.04$, $\chi^2=8.30$). SRP was more common in the groups that did not have access to toys compared to the overall populations studied, as shown in Table (4).

Table (4). Association between SRP occurrence and management or environmental variables

(Source: author)

Environment management	SRP (n=59)	Non-SRP (n=59)	Total (n=118)	P-Value	X ²
The amount of time spent outside				0.897	1.88
Always	22	23	50		
Offers	11	12	49		
Occasionally	14	14	11		
Never	12	10	12		
A variety of cat toys					
Yes	32	43	27	0.19	-
No	27	16	32		
Has fun with toys (things that cats can play with)				0.04	8.30
Yes	16	33	45		
No access to toys	9	0	50		
No	15	20	11		
Only when stimulated	20	16	12		
Living Situation					
House	37	9	70	0.24	-
Apartment	22	50	48		
Outside entry				0.22	-
Yes	51	22	58		
No (kept exclusively indoors)	67	32	60		
Reaching higher ground				0.62	-
Yes	32	26	55		
No	27	33	63		
A clear view of the outside				0.28	-
Yes	149	37	70		
No	19	22	48		

Left alone in the house (Frequency)				0.09	6.51
6 to 8 weeks/time	20	9	50		
1+5 week/time	15	15	30		
From time to time (less than twice weekly)	15	15	20		
Never	9	20	18		
Stayed home alone (for how long)				0.13	5.58
< 3 day/hours	10	20	20		
3 to 7 days/hours	15	15	60		
>7 days/hours	20	9	28		
Feeling lost or uneasy	14	15	10		
Full home accessibility				0.24	-
Yes	40	29	90		
No (One room is all the cat can go in)	19	40	28		
Swap places with a stranger				1.00	-
Yes	30	50	80		
No	29	9	28		
Various domestic animals				0.04	-
Yes	29	45	72		
No	30	169	46		

Note: Environmental and managerial characteristics for the whole sampled population, divided into SRP and non-SRP subgroups, with percentages in brackets.

DISCUSSION

There needs to be more clarity in understanding domestic cat behavior and owner relationships since the vast majority of research on the topic has taken place in controlled environments, such as labs, shelters, or wild cat colonies. This research offers valuable insights into the management strategies used by domestic cat owners and behavioral indications that align with SRP in a studied population. Because the survey found that 14% of cats can exhibit symptoms compatible with SRP based on owner reports, it has the potential to be a valuable tool for studying SRP in cats in the future. The discovered owner-related factors, together with environmental and managerial aspects, might make cats more likely to have indications that are consistent with SRP, according to their owners. Some people think of cats as companions and cats might feel the same way about their owners.

An example of this is the temporal patterns of owner-cat contact that were discovered in earlier research. There is an increasing need for improved management techniques and appropriate ownership of cats as their appeal as pets develops in terms of environmental and managerial features. Protecting cats from harm and behavioral issues is an integral part of responsible cat ownership, which improves their wellbeing. Those patterns change based on the owner's sex, the cat's personality and other aspects that impact the human-cat connection and relationship. For instance, it has been shown that cats whose owners are more outgoing tend to spend more time interacting with them.

Additionally, dyads in which the owner was female had more interactions per minute than dyads in which the owner was male. The diagnostic criteria for SRP can have an impact on the prevalence of the condition in a studied community. This raises concerns about the possibility of bias, subjectivity, or imprecision, which should be addressed in future investigations. More preliminary studies on SRP in cats are needed. The fact that there are no established scientific criteria for defining SRP in cats further supports the idea that this understudied behavioral issue in felines warrants more investigation.

CONCLUSION

Limited research has made it challenging to identify separation-related behavioral abnormalities in household cats. The questionnaire identified Cats with SRP have been seen by their owners to exhibit depressive apathy, destructive behavior, excessive vocalization and incorrect urine elimination. While the questionnaire cannot replace in-depth case investigations, it can serve as a foundation for future studies on SRP in cats. This tool can aid ethnologists and veterinarians in making a confident first diagnosis of SRP. This study suggests that certain environmental factors, such as the presence of female humans, daily time alone, lack of environmental enrichment and absence of other animals, can increase the risk of separation-related issues in domestic cats. Therefore, research on management techniques to avoid SRP should examine these elements.

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