FELINE SCRATCHING OF FURNITURE: IMPACT, OWNER ATTEMPTS TO PREVENT IT AND ATTITUDES TOWARDS DECLAWING - A SURVEY OF CAT OWNERS AND VETERINARIANS

by

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(Under the Direction of Sharon Crowell-Davis)

ABSTRACT

A survey on feline scratching of household items and attitudes towards declawing was distributed to 140 cat owners. Of 116 returned surveys, most cats (83.9 %) scratched inappropriate items, mainly furniture. Carpeted and fabric items and items that were angled vertically were scratched significantly more than items of another angle or material (all repeated measures model, $p<0.05$). Most cats (76.1 %) had at least one designated scratching item. Scratching posts were preferred over scratch pads (repeated measures model, $p=0.0156$). Declawing (12.9 % of all cats) reduced the amount of damage to furniture, pets or people significantly (all Wilcoxon's signed rank test, $n=10$, $p< 0.05$). Most cats were declawed to prevent or stop scratching of furniture.

A survey of 23 veterinary practices revealed that 17 out of 20 practices explained alternatives to declawing to clients, but were willing to declaw cats without any attempts by the client to try alternatives.

INDEX WORDS: cat, behavior, scratching, declawing, onychectomy, owner attitudes, veterinarian

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Feline scratching behavior of inanimate objects

Scratching of inanimate objects is a normal, inherited behavior in cats (Overall, 1997, 1998b). During scratching, cats extend and withdraw their front claws, gripping the scratching material every time they extend their claws (Landsberg, 1991c). Cats that have access to the outdoors often choose prominent vertical objects, such as a tree trunk, to scratch (Landsberg, 1991c; Overall, 1998b). Occasionally, horizontal pieces of bark, soil or dirt are scratched as well (Landsberg, 1991c). Cats often return to the same object for scratching (Landsberg, 1991c). Indoor cats may scratch horizontal or vertical objects of different material, such as carpet, wood or fabric. No data is currently available on what objects or material indoor cats prefer for scratching.

Scratching of inanimate objects serves different purposes (Landsberg, 1991c; Overall, 1997, 1998b).

1. Conditioning of the claws

   Scratching serves the function of removing old, frayed and loose layers of claws and to expose the sharp claw underneath. The hind claws are chewed for the same purpose.

2. Visual and olfactory marking

   Cats have sweat glands in their paws. Secretion of these glands is left on the scratched object and likely serves as olfactory communication between cats.

Scratching also leaves visual marks behind that also may have a communicatory function for other cats. Scratching behavior in free-ranging cats seems to increase if other cats are present (Houpt, 2011).

3. Stretching of the fore limbs and torso

   Cats often exhibit scratching behavior in association with stretching, shortly after waking.

Scratching is influenced by several factors. Scratching behavior occurs for the first time at about 35 days of age (Beaver, 2003). Declawed cats still go through the scratching motion, indicating a strong intrinsic motivation for the behavior (Overall, 1998b). No studies have been performed to investigate the genetics of scratching behavior, but an inherited tendency for a large or small amount of scratching behavior is possible (Landsberg, 1991c). As kittens may learn which items to scratch from their mother, selecting kittens from queens with acceptable scratching tendencies may greatly reduce the chances of the kittens developing undesirable scratching behavior (Houpt, 2011).

Landsberg (1991c) discussed environmental factors, which may influence frequency and intensity of feline scratching as well as preferences for location or material and angle of surfaces of certain objects. The availability of scratching surfaces, such as type of furniture, location and texture of household objects, type and location of scratching post provided, as well as owner related factors, including the owner's schedule and what kind of training or preventative measures are provided, influence the frequency and location of feline scratching. Access to the outside may reduce the frequency of scratching of objects in the household, if only because the cat is able to engage in some of

the necessary grooming of the claws on outdoor objects such as tree trunks (Landsberg, 1991c).

Prevention of household scratching

The prevalence of scratching of inappropriate items is high, with 42 % of cats in one study scratching furniture (Morgan, 1989). Because scratching is part of the normal behavior repertoire of the cat attempts to stop scratching completely will be unsuccessful. Therefore, appropriate objects for scratching need to be provided and scratching of inappropriate items has to be discouraged (Landsberg, 1991c).

Several approaches to prevent or redirect scratching of household items have been suggested:

Regular nail trimming has been hypothesized to reduce the cat's need to scratch and its ability to cause damage (Landsberg, 1991c), but will not stop the scratching of objects (Overall, 1998b). Outdoor access has also been discussed as a method to reduce the amount of inappropriate scratching in the house (Landsberg, 1991c).

Plastic nail sheaths, such as Soft Paws®, may be an option to reduce scratching of furniture if other techniques have been unsuccessful (Overall, 1998b). Sheaths are applied to the nails with permanent glue and need to be replaced every 6 to 12 weeks as the nails grow. Treated cats still scratch but cause less damage. Application of the nail sheaths requires that cats hold still for several minutes while the sheaths are placed. No data on the consequences of the use of nail sheaths are available.

To train kittens to use a designated scratching item, Landsberg (1991c) suggests confinement of kittens to a "kitten-proof" area. Restricting the kitten's access to a kitten-

proof area helps to avoid damage of household items and ensures the kitten's safety. The kitten should not have access to cupboards, shelves or drapes to climb on or to electric cords to chew. A scratching post or board should be placed near the cat's resting area. If the scratching post is the most appealing object in the restricted area, then no traditional training is necessary. Initially, the cat should be allowed out of this area only when supervised. This way, appropriate, immediate punishment can be applied if the cat scratches an inappropriate object. Once a preference for scratching the scratching post has developed and the cat has not attempted to scratch inappropriate items when out of the kitten-proof area under supervision, the cat can then have access to the rest of the living environment without supervision.

It is important to deny access to a preferred inappropriate scratching item (Landsberg, 1991c). This can be done either by removing it from the living space for a period of time or by covering it. Replacing the inappropriate scratching item with an appropriate scratching post is preferred, but may not always be feasible. If the cat scratches the wall or a heavy piece of furniture which cannot be easily moved, the object can be covered with netting, plastic, aluminum foil, double-sided cellophane tape or an extremely loose fabric to make it less appealing (Landsberg, 1991c). If the previously removed item must be refurbished, a new material, less attractive to the cat, should be chosen (Landsberg, 1991c). A tightly woven knobby material or an extremely smooth, impenetrable finish has been suggested to be less attractive for scratching (Landsberg, 1991c).

Recommendations for appropriate scratching items

Number of scratching items

Landsberg (1991c) points out that there are individual differences in the amount of scratching a cat engages in and consequently differences in the number of scratching posts a cat needs. Some cats may require multiple scratching posts, with one in each room, while some cats return to the same object for scratching.

Placing

A scratching post is more likely to be used if is it placed in a prominent area the cat uses frequently (Landsberg, 1991c). It should be close to the sleeping area, as cats tend to scratch and stretch after waking (Landsberg, 1991c).

If a cat has already scratched household items the new appropriate scratching post should either replace the household item or be placed directly in front of the damaged object (Landsberg, 1991c). This will allow the cat to keep the location habit. Scratch pads should be hung or mounted directly onto a wall, door or item of furniture. Once the cat begins to scratch the post, the post can be gradually relocated to a more appropriate spot (Landsberg, 1991c).

Material

Empirically, cats tend to prefer a loosely woven material for scratching, so that claws can hook into the fabric and tear it up (Landsberg, 1991c). Fabric, hemp or sandpaper has been suggested (Overall, 1998b). The orientation of the fabric weave should be longitudinal to provide the cat with the most efficient conditioning of each

claw (Beaver, 2003). Commercially available posts are often covered with a tightly woven material, such as carpet, for durability reasons (Landsberg, 1991c). Carpet can be problematic because cats' claws can get caught in the tight loops of the material resulting in discomfort or even injury for the cat (Landsberg, 1991c). A carpeted post can be covered with a securely fastened piece of upholstery to make it more appealing to the cat (Landsberg, 1991c). While the cat rips through the upholstery into the carpet, the carpet begins to take on the cat's foot pad odor and becomes rougher and frayed, possibly increasing the attractiveness of the underlying scratching post (Landsberg, 1991c).

Other commercially available posts and pads may be surfaced with sisal, cardboard, wood or wood composite (Landsberg, 1991c). Bark from logs or a dead tree stump has also been suggested (Overall, 1998b). It has been suggested that a worn post is more appealing to a cat. Therefore, it should only be replaced when necessary (Landsberg, 1991c).

It is recommended to choose a scratching item out of a material the cat might have preferred in the past (Landsberg, 1991c; Overall, 1998b). The new post can be covered with a surface similar to the scratched surface. If furniture needs to be discarded or reupholstered, a portion of the scratched material can be salvaged and used to cover the scratching post (Landsberg, 1991c). While it has been discussed that using a scratching item with a surface similar to the surface of the furniture may lead to generalizing the scratching behavior to furniture, this has not been studied and may not be the case (Overall, 1998b).

Other qualities

Cats rest their back feet on the floor and extend their forelegs to scratch (Landsberg, 1991c). Therefore, the height of the post may have to be adjusted as the kitten grows. Orientation of the scratching surface to the ground (vertical or horizontal) may be important (Overall, 1998b). Catnip may encourage exploration of scratching items (Beaver, 2003).

How to teach a cat to use an appropriate scratching item

Training a cat to use a scratching post should happen shortly after waking, as this is when cats are more likely to scratch (Landsberg, 1991c). A toy or food can be used to lure the cat to raise his front feet on the scratching post. If the post has platforms or ledges for climbing, food toys or catnip can be placed on the ledges or hung from the post (Landsberg, 1991c). Rubbing the cat's paws gently on the post has been suggested to provide visual and olfactory cues that may attract the cat back for future scratching (Landsberg, 1991c; Overall, 1998b). Scratching of the appropriate object should be rewarded with a food treat (Overall, 1998b).

Punishment for scratching inappropriate items

Punishment needs to be administered immediately when the cat shows the undesired behavior (Landsberg, 1991c; Overall, 1998b). Shouting or striking the cat is likely to not be effective, as this type of punishment is associated with the owner's presence (Beaver, 2003) and the cat will continue to scratch the inappropriate item when the owner is not present (Landsberg, 1991c; Overall, 1998b). Therefore, owner

administered punishment needs to be administered while the owner is out of sight (remote punishment). Punishment has to be aversive enough to overcome the enjoyment of scratching (Landsberg, 1991c), but the mildest stimulus that interrupts the behavior should be used (Overall, 1998b). An adverse sound, such as an ultrasonic device, water sprayers, sirens, a noisy object, such as a tin can filled with marbles tossed next to the cat, or a soft object tossed directly at the cat have been suggested (Landsberg, 1991c; Overall, 1998b; Rodan et al., 2011). Environmental punishment, such as a motion detecting water spray device, or mats which administer a mild electric shock when touched are also available. Motion detecting alarm systems, such as child safety alarms may also be useful in punishing the cat as it approaches the item.

The easiest solution to ensure consistent punishment every time the cat scratches inappropriately is to restrict the cat's access to the item being scratched when the owner is absent (Overall, 1998b). If this is not feasible, concealed deterrents are necessary. Netting or loosely draped cloth, double sided cellophane tape, pull string firecrackers that spray confetti when popped, or small inflated balloons which make an aversive sound when punctured have been suggested for discouraging scratching behavior (Landsberg, 1991c; Overall, 1998b). Unpleasant odors, such as moth balls or commercially available cat repellents may be effective as well (Landsberg, 1991c). It is important to ensure that the cat is punished every time it attempts to scratch inappropriately. If concealed deterrents are used, they must be reset every time they are triggered (Landsberg, 1991c; Overall, 1998b).

Declawing

Declawing or onychectomy is the surgical amputation of all or part of a cat's third phalanges and the attached claws of the front paws only or all four paws (Price, 1961; Tobias, 1994). Estimates of percentage of declawed cats compared to the overall populations of pet cats in the U.S. vary. Between 20 to 50 % of domestic cats are declawed (Morgan, 1989: 24 out of 122 cats; Manning, 2011: 32 % of cats). Patronek et al. (1996) surveyed 281 households that relinquished cats to the humane society and 459 control households that owned a cat. Of the cats in control household 49.9 % were declawed, compared with 38.5 % of cats in households that relinquished ownership. Patronek (2001) reported that 14.4 million out of 59 million owned cats (24.4 %) have undergone onychectomy.

Legal situation

Declawing for non-medical reasons is prohibited in Brazil, some states of Australia and many European countries, including Switzerland and Germany (Brazilian Veterinary Medicine Association, 2008; Bundesministerium der Justiz, 1992; Federal Assemby of the Swiss Confederation, 1978; Minister for Regional Infrastructure and Service, 1996). Most European countries are bound to the European Convention for the Protection of Pet Animals (Statute of the Council of Europe, 1992), which only allows declawing for medical reasons or for the benefit of any particular animal.

Some Asian countries (Japan, Korea and China) do not regulate declawing of cats and declawing is a common practice in these countries. The United States is the only country of the western hemisphere where declawing for non-medical reasons is common

and not illegal. Attempts to outlaw declawing were made in California. The procedure was first banned in West Hollywood, California in 2003 (Anonymous, 2003). The California Veterinary Medical Association (CVMA) contested this bill, stating that the law infringed on veterinarians' state granted rights (Nolen, 2006). Although the CVMA initially prevailed, the law banning declawing in West Hollywood was reinstated in 2007 (Egelko, 2007). In 2009 several other California cities including San Francisco and Los Angeles passed ordinances banning declawing on the basis of animal cruelty (La Ganga and Colby, 2009). Since 2010, cities are prohibited from outlawing procedures "that fall within the scope of practice of a person licensed by the state Department of Consumer Affairs", thereby including onychectomy (California Senate, 2010). The new bill affects only laws passed after its introduction and does not overturn the previous laws in West Hollywood, San Francisco and other California cities.

In a recent poll of 1000 pet owners, 36% of all pet owners disagree with declawing and 18% favor a law banning declawing. Cat owners are more prone to favor a law banning the procedure, with 24 % favoring such a law. On the other hand, 60 % of pet owners would oppose a law banning declawing, partly because they feel the government should not interfere with decisions that are to be made by cat owners and veterinarians (Manning, 2011).

Reasons for declaw

The two most common reasons for declaw surgery are for prevention of scratching of furniture (Bennet, 1988) and protection of immunocompromised people from injury caused by human directed scratching behavior (Atwood-Harvey, 2005;

Landsberg, 1991a, b; Miller, 1998; Yeon et al., 2001). In one survey of 276 owners of declawed cats (Landsberg, 1991a), 86 % of owners reported household damage to such items as furniture, waterbeds, draperies, wallpaper or clothing as the primary reason for declawing. The second most common reason, occurring in 29 % of the declawed cats, was to prevent or reduce injuries to people, particularly during play, kneading, handling or petting. Being kept indoors was a factor in the decision for 9 % of the declawed cats, 8% were declawed for the safety of other pets and 1 % to reduce the need for punishment. Owners could give multiple reasons for declaw surgery in this study. In another study, Landsberg (1991b) found that 229 out of 230 veterinarians responding to a survey named furniture damage as the principal reason for declawing.

Attitudes towards declawing

Declawing is a controversial subject. Among cat owners and veterinarians, opinions are divided. According to Landsberg (1991a), most veterinarians discuss declawing as a last resort before surrendering or euthanizing a cat, but consider it to be preferable over losing the cat from the household (Morgan, 1989). In the past, a few veterinarians have recommended declawing routinely, with one study finding that 8 out of 276 cats were being declawed based on their veterinarian's recommendation (Landsberg, 1991a).

The American Veterinary Medical Association considers onychectomy justifiable in cats that use their claws destructively and cannot be trained otherwise, especially if declawing allows the cat to be kept in the household or when clawing presents a zoonotic risk for the cat owner (AVMA, 2006). The procedure should not be performed solely for

cosmetic reasons. The Canadian Veterinary Medical Association acknowledges that onychectomy may be the only option in cats that otherwise would be placed in shelters or euthanized. It emphasizes that only forepaws should be declawed and that it is important to relieve postoperative discomfort.

The statement that declawing is often the last resort for owners who have explored other behavioral options is challenged by the results of Landsberg (1991a). In his survey of 276 owners of declawed cats, he found that only 8 out of 276 owners stated that they had unsuccessfully tried scratching posts and only 12 out of 276 stated that their cats had to be declawed or they would not have been kept (Landsberg, 1991a).

A recent poll of American pet owners (Manning, 2011) revealed that nearly 60 % of American pet owners, including 55% of cat owners, state that it is acceptable to have a cat declawed.

In Landsberg's survey of 276 owners of declawed cats, only 4 % of owners had a negative opinion of declawing (Landsberg, 1991a). Seventy percent of owners reported an improved relationship with their cat. In another study, 20 % of cat owners reacted negatively to the question regarding declawing, even though the respondents' opinion was not requested (Morgan, 1989).

Declawing techniques

Amputation of the third phalanx can be performed with nail trimmers, scalpel blades or surgical lasers (Holmberg and Brisson, 2006; Mison et al., 2002; Price, 1961; Robinson et al., 2007; Tobias, 1994; Young, 2002). Although declaw surgery with a surgical laser has been discussed anecdotally to be superior to other techniques due to a

perceived lessening of postoperative pain and a more rapid recovery (AVMA, 2009), in controlled studies the clinically observed benefit of laser technique is minimal (Holmberg and Brisson, 2006; Mison et al., 2002).

Age for declaw surgery

The ideal age for the procedure is controversial (Overall, 1998b). It has been suggested that declawing at the time of spaying or neutering is advantageous, as it reduces the risk associated with a second anesthetic episode (McKeown et al., 1988). In one survey of 276 cat owners, cats declawed at one year of age or less exhibited fewer postoperative problems and recovered more rapidly than cats declawed greater than one year of age (Landsberg, 1991a). However, if in following with the recommendations of the AVMA that declawing is justifiable in cats that use their claws destructively and cannot be trained otherwise, it is unlikely that all behavioral options and training has been explored if kittens are declawed at the time of spay or neuter.

Behavioral consequences of declawing

In one study, owners of declawed cats reported decreased damage (87 %), decreased injury (30 %) and a better relationship with their pet (43%) as benefits of declawing (Landsberg, 1991a). In the same study, 4 % of cat owners reported a possible increase in biting or harder biting following declawing. However, all owners considered the biting less significant than the previous scratching problem (Landsberg, 1991a). In the same study, three out of 276 declawed cats showed significant behavior changes, which included house-soiling, no longer covering stools and resisting their paws being handled.

In another survey of 25 owners of declawed cats (Bennet, 1988), following declaw, one cat (4 %) began to defecate outside the litter box and three cats (12 %) began to bite. In one study comparing declawing to tendonectomy, one out of 18 (5 %) declawed cats and 2 of 20 cats that underwent tendonectomy exhibited inappropriate elimination or excessive chewing on the paws (Jankowski et al., 1998).

In a study addressing risk factors for relinquishment of cats to animal shelters, no statistically significant difference in aggression or inappropriate elimination was found between declawed and clawed cats relinquished to a shelter (Patronek, 2001). Sung and Crowell-Davis (2006) also did not find any evidence that declawed cats have elimination behavior problems more frequently than cats that were not declawed.

Declawed cats continue to go through the motion of scratching furniture. In one study this was true for between 59 and 78 % of declawed cats (Yeon et al., 2001).

Medical consequences of declawing

Immediate postoperative problems

Declawing is a painful procedure and pre-or postoperative pain management is essential (Carroll et al., 1998; Carroll et al., 2005; Dobbins et al., 2002; Franks et al., 2000; Swiderski, 2002). Several protocols for pain management have been successful in reducing signs of immediate postoperative pain (Carroll et al., 1998; Carroll et al., 2005; Curcio et al., 2006; Dobbins et al., 2002; Franks et al., 2000; Gellasch et al., 2002; Romans et al., 2005). In one study, 34 % of declawed cats experienced some discomfort or problems, including being tender or sore, problems jumping or climbing, delayed healing or bleeding, not eliminating in litter boxes filled with strips of paper, infection

and house soiling when first discharged (Landsberg, 1991a). Seventy percent of cats recovered fully within a week, 90 % within two weeks and all but 3 cats were fully recovered within 2 months (Landsberg, 1991a).

In another study investigating complications after onychectomy at a teaching institution, 51% of cats had one or more complications immediately after surgery and early postoperative complications included pain (38.1%), hemorrhage (31.9%), lameness (26.9%), swelling (6.3%), or non-weight-bearing (5.6%) (Tobias, 1994).

A prospective study of 20 cats that underwent tendonectomy and 18 cats that underwent onychectomy reported that the median number of days until each cat walked normally was 2 days for cats with tendonectomy (range 1-30 days), and 6 days for cats that underwent onychectomy (range 1-21 days). Two cats were excluded from this analysis: One cat that underwent tendonectomy did not walk normally for 300 days after surgery and one cat that underwent onychectomy did not walk normally for 180 days. Short term complications in this study included hemorrhage and infection, each occurring in three cases (Jankowski et al., 1998).

In another study of onychectomy, 51 % of cats over 1 year of age had immediate problems compared to 29 % of cats declawed at 1 year of age or less (Landsberg, 1991a).

Problems after the initial recovery period

Landsberg (1991a) reported that 10 out of 276 cats (4%) developed or continued to have problems after the initial recovery period. In five of these cases the claws regrew and in one case one claw was inadvertently not removed. One cat had difficulty bearing weight for at least 4 months following surgery. Three cats showed behavior changes,

which included house-soiling, no longer covering stools and disliking their paws being handled. Ten out of 276 respondents (4%) reported a possible increase in biting or harder biting following declawing (Landsberg, 1991a).

In another study, limb function in 27 declawed cats was still significantly reduced 12 days after surgery (Romans et al., 2005). Persistent lameness was observed in less than one percent of declawed cats (five of 582, or 0.86 % - Patronek, 2001).

Out of 121 cats which were declawed at a teaching hospital and for which follow-up was available, 19.8% developed complications after release, including infection (11.6%), regrowth (7.4%), P2 protrusion (1.7%), palmagrade stance (1.7%) and prolonged, intermittent lameness (0.8%) (Tobias, 1994). Another study in a teaching hospital, reported a far lower complication rate, with 2.6 % of female cats and 0% of male cats that were declawed, developing postoperative complications (Pollari et al., 1996).

Hemorrhage, wound dehiscence, distal limb ischemia, radial nerve paralysis, claw regrowth, wound infection or flexor tendon contracture are possible consequences of improper surgical technique or postoperative care (Anderson and White, 2000; AVMA, 2009; Cooper et al., 2005; Fowler and McDonald, 1982; Martinez et al., 1993; Patronek, 2001; Tobias, 1994).

Chapter 2: Animals, materials and methods

Survey of veterinary general practitioners on attitude towards declawing

Location of study, subjects and data collection

A list of all veterinary practices in Athens – Clarke County and Oconee County, Georgia was compiled. Veterinary practices which did not offer feline neuter surgery, including practices limited to large animal medicine or referral small animal medicine and mobile practices, were excluded. Practice owners were contacted and asked if they were willing to participate in a survey regarding their attitudes about declawing.

Questionnaires for veterinary general practitioners about attitude towards declawing

The following information was obtained from all veterinarians working in each practice: Position (e.g. practice owner, partner, associate), sex, age, duration of time working as a veterinarian in years.

Veterinarians working in each practice were asked to collectively agree which of the following descriptions best described the practice philosophy about declawing.

1. We declaw cats upon client request without advising the client of alternatives.

2. We explain alternatives to declawing to clients, but are willing to declaw cats without any attempts by the client to try alternatives.

3. We give information on alternatives to clients and require that the client attempts at least one alternative before we perform the declaw procedure.

4. We absolutely refuse to declaw cats under any and all circumstances.

Practice owners were also surveyed regarding what techniques they used for onychectomy, i.e laser, radiofrequency, blade, nail trimmers, other and whether they performed tendonectomy in conjunction with neuter surgery or not. They were also asked to estimate the numbers of neuter surgeries with and without declaw the practice performed per month. For an example of the questionnaire, see Appendix A.

A second questionnaire was sent out to all veterinary practices which had sent back the questionnaire about attitude towards declawing to verify retrospectively the number of spay and neuter surgeries with and without declaw surgery as well as declaw surgeries without spay/neuter between 2/28/2011 – 4/23/2011 and from 5/1/2010 – 4/30/2011 (see Appendix B).

Survey of cat owners on feline scratching of household items, owner attempts to prevent it and owner attitudes towards declawing

Location of study

The study was performed at the Community Practice Clinic (CPC) of the University of Georgia, College of Veterinary Medicine. The CPC offers fourth year veterinary students the opportunity to assist experienced veterinarians in the primary care of cats and dogs. The primary investigator worked at the CPC, which facilitated the distribution of questionnaires to clients.

Subjects and data collection

A questionnaire (see Appendix C) was given to clients by either front desk personnel or veterinary students. Clients who reported that their cat was kept indoors for any part of their daily routine were eligible to receive a questionnaire, independent of the reason for visiting the CPC. Cat owners were instructed to complete the questionnaire only for the cat that was brought to the CPC that day, even if they owned multiple cats. Only one questionnaire was collected for each cat, even if the cat visited the CPC multiple times during the survey period. Cat owners who brought in multiple cats during the survey period were allowed to complete one questionnaire for each cat presented.

Owners received the questionnaire, a letter with information about the study and an envelope for the completed questionnaire in order to maintain owner confidentiality. Questionnaires were completed while owners were waiting for their cat to be discharged. Questionnaires were collected in a drop box at the front desk of the CPC. The informational letter ensured that all owners received the same instructions, independent of who supplied the owner with the questionnaire.

The survey period was from 5/23/2011 to 2/22/2012. In total, 140 questionnaires were distributed.

Questionnaires for cat owners

A pilot test of the questionnaire was conducted with 7 veterinary students and graduate students in animal behavior, and was modified based on feedback. The final questionnaire was composed of four sections.

Section 1: Information about cats in household

The age of the cat, duration of time the cat had lived in household, sex, neuter status, information about lifestyle (indoor or indoor/outdoor) and declaw status were obtained. If the cat was declawed, data recorded included the age of the cat at time of declaw, association of declaw surgery with neuter surgery and what feet were declawed (front feet or all feet).

The same information was obtained for all cats living in the household. The following sections referred only to the cat presented to the CPC.

Section 2: Scratching of inappropriate items

Owners were asked if their cat had scratched any items not designated for scratching since adoption. If they answered yes, owners were asked to fill out a table collecting data about what inappropriate items had been scratched. Information was collected on type of scratching item (sofa/s, chair/s, table/s or other furniture; carpet; wall/s or doorway/s; drapes, curtains or other hanging textile items; other), material of scratching item (cardboard; wood; carpet; leather; fabric; wicker; other) and how the surface the cat scratched was angled to the ground (vertical, e.g. the side of sofa; horizontal, e.g. carpet; angle to the ground). In addition, frequency of scratching of inappropriate items (once daily, more than once a week, every 1-2 weeks, every 3-4 weeks, once a month or less) was collected. In addition, owners could comment on why they thought their cat preferred this item. Owners were also asked to estimate the dollar amount of damage that was caused (more than $ 400, $ 201- $ 400, $ 100– $ 200, less than $ 100) and how they attempted to stop scratching of inappropriate items (yelled at

cat, sprayed water, spanked cat, shook a device which makes an unpleasant sound, other interruption, covered furniture with unattractive material, applied double sided tape on item being scratched, removed preferred furniture from living space for awhile, applied vinyl nail caps, bought designated scratching items, placed designated scratching items next to inappropriate scratching item, taught cat to use designated scratching items, none of the above, other). Owners were also asked who gave them advice on how to prevent scratching of inappropriate items (veterinarian; pet shop employee; books, TV, internet; cat breeder; cat owners; none received; other).

Section 3: Designated scratching items

The owners' were asked if the cat had any designated scratching items currently available. If yes, owners were to fill out a table collecting the following information: Type of scratching item (scratching post or pole, scratching pad, other), material of scratching item (cardboard, wood, carpet, sisal fabric, sisal rope, burlap, fabric, other), angle of scratching item to the ground (vertical, horizontal, angle to the ground), approximate length of scratching item, frequency of use (once daily, more than once a week, every 1-2 weeks, every 3-4 weeks, once a month or less), room in which scratching item is located (living or family room, bed room, guest room, hall way, kitchen, dining room, bathroom, other), comment on why owners think cat prefers this item. Owners were also asked how their cat was taught to use the scratching item (no training, sprinkled catnip flakes over scratching item or used catnip spray, used Feliway^{TM} Spray, verbal praise, treat, clicker training, put cat near scratching area, took front paws and scratched them over scratching item, tied a toy on scratching item, played with cat near scratching

item, played with cat so that cat would touch scratching item with paws during play, other).

Section 4: Declawing

Information was obtained about the amount of damage to furniture and household items, injury of people with claws and injury of pets with claws with a 4-point rating scale ('none', 'mild', 'moderate', 'severe'). If the cat was declawed, owners were asked to rate the behavior before and after declaw surgery. Owners were also asked, if someone in their household had an increased risk for infections as a consequence of being scratched by the cat e.g. as the person was immunocompromised.

Owners who had their cat declawed were asked why they chose declaw surgery (to prevent scratching of household items, to stop scratching of household items, to prevent injury of people by the cat's claws, to stop injury of people, to prevent injury of pets, to stop injury of pets, other) and what they would have done to solve the scratching problem, if declawing had not been available (keep the cat and allow scratching; not keep the cat – surrender, finding another home, euthanasia; other).

Owners whose cat was not declawed were asked why they decided against declaw surgery (because cat had not been destructive, because owner could not afford surgery, because cat is partly outdoor and needs claws, because owner was concerned about adverse effects, because owner felt declawing is wrong, other). Owners were also asked if they might have their cat declawed in the future if he/she began scratching furniture, people or pets or if they will not get their cat declawed in future, even if he/she scratched furniture, people or pets.

Ethical approval/Human subject research approval

The study was approved by the Human Subjects Office of the University of Georgia, Institutional Review Board.

Data management and analysis

All questionnaire data were entered into Microsoft Office Excel 2010. Repeated measures model and post hoc tests were performed with SAS V 9.2 (Cary, NC,USA). The remainder of the statistical analysis was performed with Stata/IC 10.1 for Windows, Stata Corp LP (Texas, USA). All hypothesis tests were 2-sided and the significance level was $\alpha = 0.05$.

Data from the survey of veterinary general practitioners about attitude towards declawing were analyzed descriptively.

Data from the survey of cat owners were analyzed mainly descriptively. If only part of the questionnaire was filled out, answers given were included in the analysis.

Age of cats at time of declaw (declawed at neuter vs. declawed not at time of neuter) was compared using a Mann Whitney-U-Test.

The raw agreement for the survey cat being declawed and at least one other cat in the household being declawed and for the survey cat not being declawed and no other cat in the household being declawed was calculated for multi-cat households. The difference between number of declawed cats living in a household where the survey cat was not declawed and a household where the survey cat was declawed was compared using the Mann-Whitney-U-Test.

Tables of type, material and angle of inappropriate scratching items were often not filled out correctly. Beds, boxsprings or mattresses were occasionally classified as furniture and occasionally as other. To be consistent, all of these items were retrospectively classified as furniture.

Owners were asked to fill out one line per each inappropriate item scratched. However, several times, data for multiple scratching items were filled out in one row, therefore not allowing clear assignment of type, material, angle and frequency of scratching.

For descriptive statistics whether or not cats scratched a certain type of item was analyzed. For this, all types of items scratched were included in the analyses, even if material, angle or frequency of scratching could not be assigned. Since most cats scratched furniture, which material of furniture was scratched and how the furniture was angled was analyzed if this information could be clearly assigned. The number of different types of items scratched as well as the item that had the highest rate of scratching frequency was recorded as well.

A repeated measures model that recognized multiple frequencies as belonging to the same cat was used to test for differences in scratching frequencies between characteristics (type, material, angle) of objects that were scratched inappropriately. Multiple comparisons were adjusted for using Tukey's test.

An unstructured covariance structure was used in all repeated measures models. All hypothesis tests were 2-sided and the significance level was $\alpha = 0.05$. The repeated measures analysis was performed using PROC MIXED in SAS.

For repeated measures models, data where frequency was not clearly connected to type of item, material or angle, e.g. because multiple answers were given in one category, were counted as missing values. If a type, material or angle was not mentioned in the survey, it was categorized as never scratched. If several frequencies were given for one type, material or angle only the highest frequency given was included in the analysis.

Amount of damage caused, attempts to stop the cat from scratching and the source of advice were analyzed descriptively.

To evaluate the effectiveness of attempts to interrupt scratching, strategies for disrupting scratching were grouped into disrupting the behavior (yelling at cat when scratching, spraying water at cat when scratching, spanking cat, shaking a rattle can or other device to make an unpleasant sound, other interruption), physically preventing the cat from scratching the item (covering the furniture with an unattractive material, applying double sided tape or other sticky material to furniture, removing furniture for a while, using vinyl nail caps), encouraging an alternative (buying designated scratching item, placing designated scratching item next to inappropriate scratching item, teaching cat to use designated scratching item) or no attempts. If strategies discussed under "other" fit into one of the first three categories mentioned above, they were grouped as such. Student's t-tests were used to compare the means of scratching frequencies between cats of survey participants who did and did not use specific strategies to control inappropriate scratching. The folded form F statistic was used to test if variances were equal between groups. If unequal, then Satterwaithe's approximation for degrees of freedom for the student's t-test was used.

Tables to record type, material, angle, length and location of designated scratching items were also often not filled out correctly. Owners were asked to complete one line per each designated item provided. However, several times, data for multiple designated scratching items were filled in one row.

For descriptive statistics of types of designated items available, all types of designated items were included in the analyses, even if material, angle, length, room furnished or frequency of scratching could not be assigned. The number of different designated scratching items was recorded as well. If several items were filled in one row, number of designated items was estimated by number of rooms furnished. The highest scratching frequency for each cat was recorded as well. Material, angle, length and room furnished for each type of designated scratching item was described, if information could be clearly assigned. This was not the case in 7 surveys, as information for more than one scratching item was given per row. These surveys were excluded from further analysis. If one type of item was paired with multiple pieces of information in other categories, the extra information was deleted and treated as missing values. However, as the angle combination horizontal and vertical (with or without angle to the ground) and the material combination carpet and sisal rope (with or without additional materials) were given several times, new categories were designed for these. If a range of length was given, the lower end of the range was included in the analysis. A category of > than 150 cm was designed for items where length was not given but that were clearly larger than 150 cm, e.g. a door and door frame or floor to ceiling cat tree.

A repeated measures model that recognized multiple frequencies as belonging to the same cat was used to test for differences in scratching frequencies between

characteristics (e.g. type, material, length, angle and room furnished) of objects that were designated for scratching. Multiple comparisons were adjusted for using Tukey's test.

An unstructured covariance structure was used in all repeated measures models. All hypothesis tests were 2-sided and the significance level was $\alpha = 0.05$. The repeated measures analysis was performed using PROC MIXED in SAS.

For repeated measures, the same data set was used as described above, therefore counting fields, where frequency was not clearly connected to type of item, material or angle, e.g. because multiple answers were given in one category, as missing values. If a type, material, angle or room was not mentioned in one survey, it was categorized as missing value (as the owner did not provide this item to the cat and data therefore was not available). If several frequencies of scratching were given for one type, material, length, angle or room furnished only the highest frequency given was included in the analysis.

To evaluate the effectiveness of attempts to teach scratching of designated items these strategies were grouped in 1) using catnip flakes or spray with designated item, 2) praising cat for scratching, 3) giving the cat a treat (clicker training was included in this category, as clicker training is usually paired with a food reward), 4) placing cat near scratching area, 5) scratching front paws over scratching area, 6) using a toy to encourage scratching (included tying a toy on the scratching item, playing with the cat and toy near the area or in a way that the cat scratched the item) or 7) no attempts. None of the strategies mentioned under other fitted into one of these categories.

Student's t-tests were used to compare the means of scratching frequencies between cats of survey participants who did and did not use specific strategies to teach cats to scratch designated objects. The folded form F statistic was used to test if

variances were equal between groups. If unequal, then Satterwaithe's approximation for degrees of freedom for the student's t-test was used.

Amount of damage to furniture and amount of injury to people or pets caused by declawed and non-declawed tests was compared using Mann-Whitney-U-Test. Amount of damage to furniture and amount of injury to people or pets caused by declawed cats before and after declaw surgery was compared with Wilcoxon's signed rank test.

Chapter 3: Results

Survey of veterinary general practitioners about attitude towards declawing

Of all 28 veterinary practices in Athens – Clarke County and Oconee-County, 23 practices fulfilled the inclusion criteria. The questionnaire was returned by 20 practices (response rate 87 %). In these 20 practices, 44 veterinarians were employed (range 1 – 5 veterinarians, average 2.2 veterinarians per practice, 17 male veterinarians and 27 female veterinarians).

Veterinarians had between 1 and 40 years of practice experience (average 14 years). Position within the practice was not analyzed, as in 5 of 20 questionnaires the veterinarian's name was filled in instead of the position within the practice.

Regarding declaw attitude, 17 out of 20 practices agreed on the option: 'We explain alternatives to declawing to clients, but are willing to declaw cats without any attempts by the client to try alternatives.' One practice each chose 'We declaw cats upon client request without advising the client of alternatives.' and 'We give information on alternatives to clients and require that the client attempts at least one alternative before we perform the declaw procedure.' One practice could not agree on one option, but commented that "the decision depends on the situation". The option: 'We absolutely refuse to declaw cats under any and all circumstances.' was not checked by any practice. However, one practice commented, that one of the veterinarians "does not perform the surgery due to humane/ethical reasons". Two practices commented that they highly encourage alternatives, but do not require them. Two practices commented that they only

perform front declaws (one practice: “unless the owner is immunocompromised”) and one practice commented that cats have to be less than 4 years old for the surgery to be performed.

The majority of practices used nail trimmers or blades to declaw cats (5 practices: blades, 4 practices: nail trimmers, 5 practices: blade and nail trimmers, 2 practices: blades, nail trimmers or laser surgery). In one of the two practices where all three techniques were used, the decision depended upon who performed the surgery. The other practice offered laser surgery to cat owners for an extra charge and left the decision of surgery technique to the cat owner. Laser surgery only was performed in 2 practices. The remaining two practices referred cats for declaw surgery to practices that offered laser surgery (Fig. 1). None of the practices performed tendonectomy surgery.

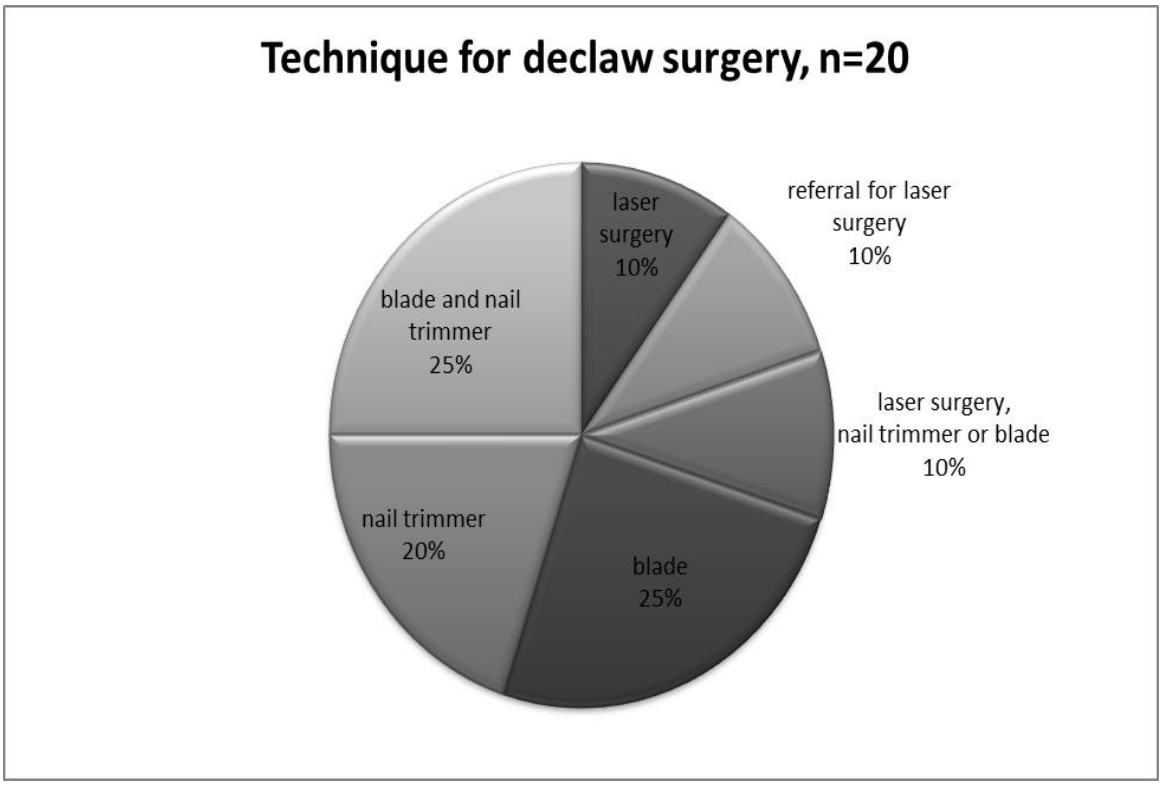

Figure 1: Surgery technique used for declaw by 20 veterinary practices in Athens - Clarke County and Oconee - County.

Estimated numbers of neuter surgeries with and without declaw were not analyzed. Instead, results of retrospective numbers of spays and neuters with and without declaw as well as numbers from declaw surgeries without spay/neuters are given for 11 veterinary practices from 2/28/2011 – 4/23/2011 (response rate 55 %) and for 10 veterinary practices from 5/1/2010-4/30/2011 (response rate 50 %). As the information was not given by several practices, the percentage of cats owned by rescue organizations was not analyzed.

Table 1: Spay/neuters and declaws from 2/28/2011-4/23/2011: Numbers of spays/neuters without and with declaw surgery and declaw surgery without spay/neuter surgery for 11 veterinary practices in Athens Clark County and Oconee – County.

	Numbers of cats spayed/neutered without declaw surgery Mean (Min – Max)	Numbers of cats spayed/neutered with declaw surgery Mean (Min – Max)	Numbers of cats declawed without spay/neuter surgery Mean (Min – Max)
Females	2.7 (0 – 9)	0.1 (0 - 1)	0.7 (0 – 3)
Males	2.6 (0 – 8)	0 (0 – 0)	0.1 (0 - 1)
Total	5.4 (0 – 17)	0.1 (0 - 1)	0.8 (0 – 3)

Table 2: Spay/neuters and declaws from 5/1/2010-4/30/2011: Numbers of spays/neuters without and with declaw surgery and declaw surgery without spay/neuter surgery for 10 veterinary practices in Athens Clark County and Oconee – County.

	Numbers of cats spayed/neutered without declaw surgery Mean (Min – Max)	Numbers of cats spayed/neutered with declaw surgery Mean (Min – Max)	Numbers of cats declawed without spay/neuter surgery Mean (Min – Max)
Females	18.2 (1 – 46)	2.3 (0 – 14)	2.9 (0 – 6)
Males	16.6 (2 – 30)	2.9 (0 – 11)	1.9 (0 – 4)
Total	34.8 (3 - 72)	2.3 (0 – 25)	4.8 (0 – 10)

Survey of cat owners on feline scratching of household items, owner attempts to prevent it and owner attitudes towards declawing

Response rate

During the 9 months survey period, 469 cats were seen at the CPC (multiple visits of the same cat were counted only once). During this period, 140 surveys were distributed, which means that a survey was given out to 29.9% percent of the clients. Of these 140 surveys distributed, 116 surveys (82.9 %) were returned.

Information about cats in household

Age of cats at the time of survey was unknown for 3 cats. For the remaining 113 cats mean age was 55 months or 4.6 years, median was 36 months or 3 years, with a range of 1 month to 216 months or 18 years. For 111 cats (for 5 surveys this information could not be analyzed due to being filled out in an unclear manner) time in household ranged from 0 months (adopted 2 days ago) to 204 months (17 years) with a median of 24.5 months and a mean of 44.5 months. Of 116 cats 66 were female and 50 were male cats. Neuter status was recorded for 115 cats: the majority of cats (85.2%) were neutered, 14.8 % of cats were intact.

Fifteen of 116 (12.9%) cats were declawed. Two of 15 cats had all four feet declawed. The other cats were declawed on their front feet only. Six cats were declawed at time of neuter and 5 cats were not declawed at time of neuter. For 4 cats this information was not available. Three of these cats had already been declawed when adopted by the current owner. Age of cats declawed at time of neuter ranged from 2-12 months with a median age of 6 months. Cats that were not declawed concurrently with

neuter were declawed at a median age of 12 months (range 10-72 months). Cats declawed at time of neuter tended to be significantly younger than cats not declawed at time of neuter (Mann Whitney-U-Test, z=-1.915, n_1=6, n_2=5, p=0.056).

Of 116 cats, 24 cats (20.7 %) had access to the outdoors and 92 cats were indoor only. One of the indoor/outdoor cats was declawed. On average, cat owners had 2.1 cats (median 2, range 1 to 7 cats, n=115, number of cats in household not given in 1 survey).

For households with more than one cat, data were analyzed in regard to the declaw status of the other cats in the household. Of 15 survey cats that were declawed, 8 lived in a multi-cat household. All of these households included at least one other declawed cat (raw agreement between declaw status of survey cat and at least one more cat in household declawed = 100 %). The average number of declawed cats in a multi-cat household where the survey cat was declawed was 1.4 cats per household excluding the survey cat (median 1, range 1-2, n=8). Of 101 survey cats that were not declawed, 55 lived in a multi-cat household. One owner did not provide information about the declaw status of the other cats living in the household and the survey was excluded from the analysis. Of 54 non-declawed cats in multi-cat households 45 cats lived together with non-declawed cats only and 9 cats lived together with at least one declawed cat (raw agreement between survey cat is not declawed and no other cat in the household is declawed = 83.33 %). On average, 0.2 cats in these households were declawed (median 0, range 0-3, n=54). The difference between number of declawed cats living in a household where the survey cat was not declawed and a household where the survey cat was declawed was statistically significant (Mann-Whitney-U-Test, n_1=54, n_2=8, z=-4.946, p>0.0001).

Scratching of inappropriate items

In four of 116 surveys information was not provided on whether the cat scratched inappropriate items. Scratching of inappropriate items was reported in 83.9 % (94 out of 112 cats) of cats, while 16.1 % (18 cats) did not scratch inappropriate items.

Out of the 94 surveys that referred to cats with a history of scratching inappropriate items, in 1 survey the table regarding inappropriate scratching items was not completed and in one survey the type of scratching item was not reported. Both surveys were excluded from the analysis of description of the inappropriate scratching item.

Types of inappropriate scratching items are given in figure 2. Most cats (81.5 %) scratched chairs, sofas, tables or other furniture including beds. Nearly two thirds of the cats that scratched inappropriate items scratched carpet (64.1 %). Scratching of doorways or walls and of drapes, curtains or other hanging textile items was less common (20.7 % and 18.5 % respectively). Other items that were scratched (8.7 %) included purses and backpacks (mentioned in 4 surveys), cabinet doors, clothes, a window screen and the back of LP albums (each mentioned once).

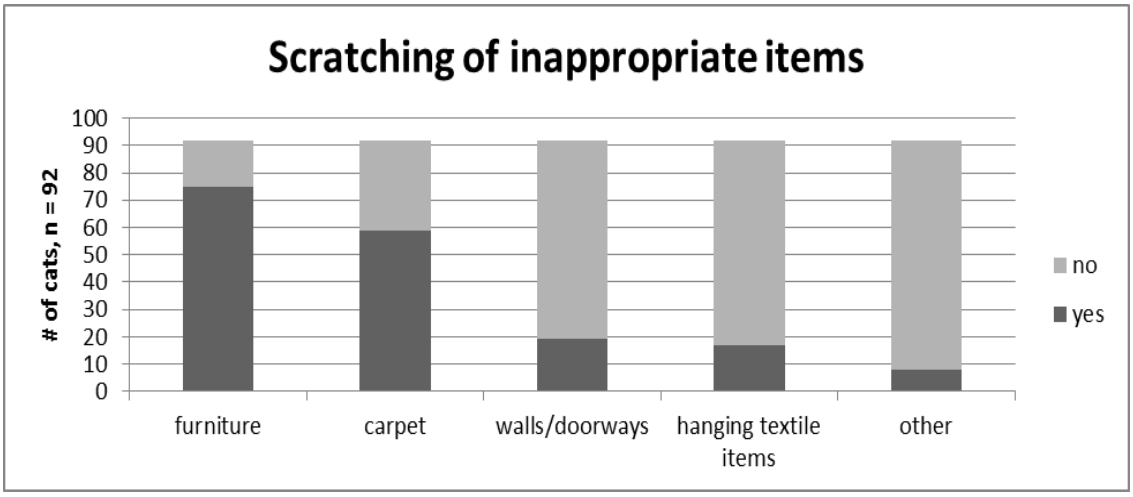

Figure 2: Scratching of inappropriate items, n=92 surveys

Most cats scratched one (31 out of 92 cats) or two (40 out of 92 cats) different type of items. Three or more different types of items were scratched by 21 cats.

Data on material of furniture were available for 62 out of 75 cats that scratched furniture. Data on angle of furniture was available for 61 out of 75 cats. Most cats scratched furniture made out of or covered with fabric, followed by leather, carpet, wood, wicker and other materials (Fig. 3).

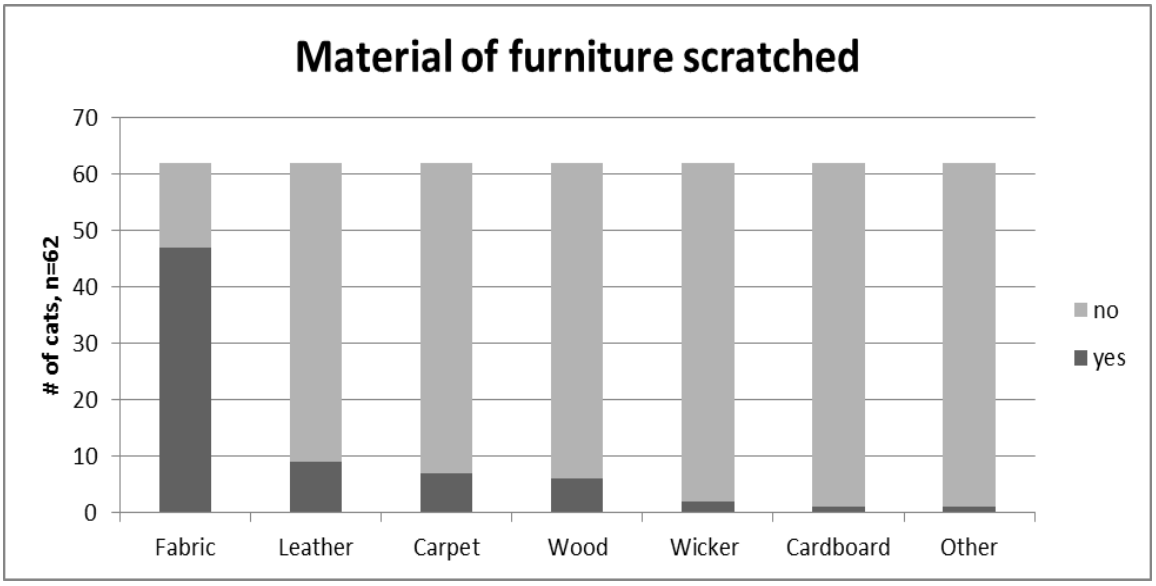

Figure 3: Material of scratched furniture, n=62 cats, multiple answers were possible

Most cats scratched furniture where it was angled vertical, followed by furniture with a horizontal angle to the ground and angled to the ground.

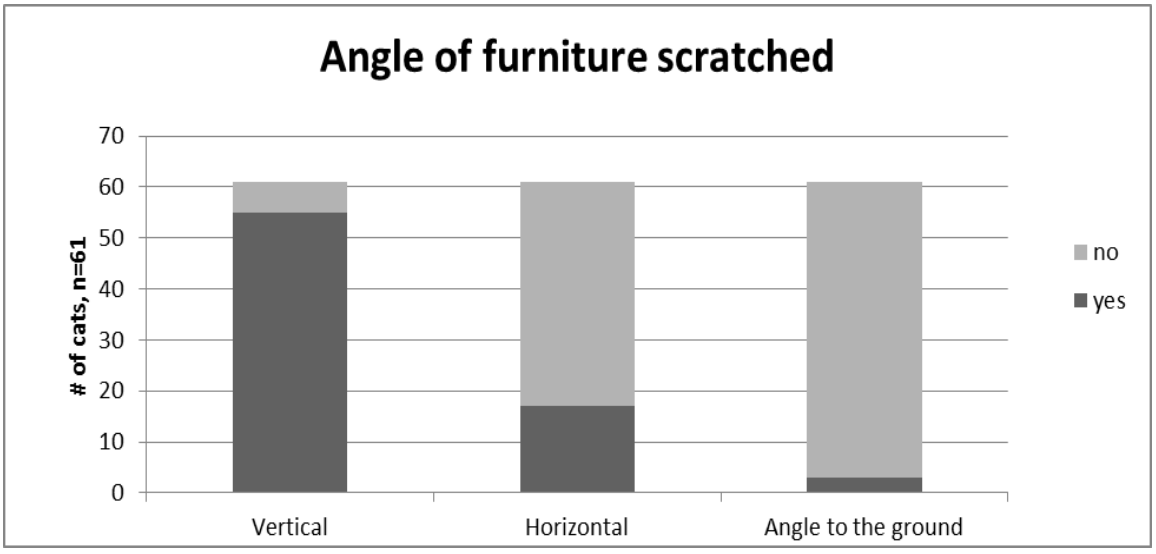

Figure 4: Angle of scratched furniture, n=61 cats, multiple answers were possible

Most cats that scratched inappropriate items (55 out of 92 cats) scratched at least once daily, 25 cats scratched more than once a week, 9 cats scratched every 1-2 weeks and 2 cats scratched every 3-4 weeks. No cat scratched once a month or less and in 1 survey the frequency of scratching items was not reported (Fig. 4).

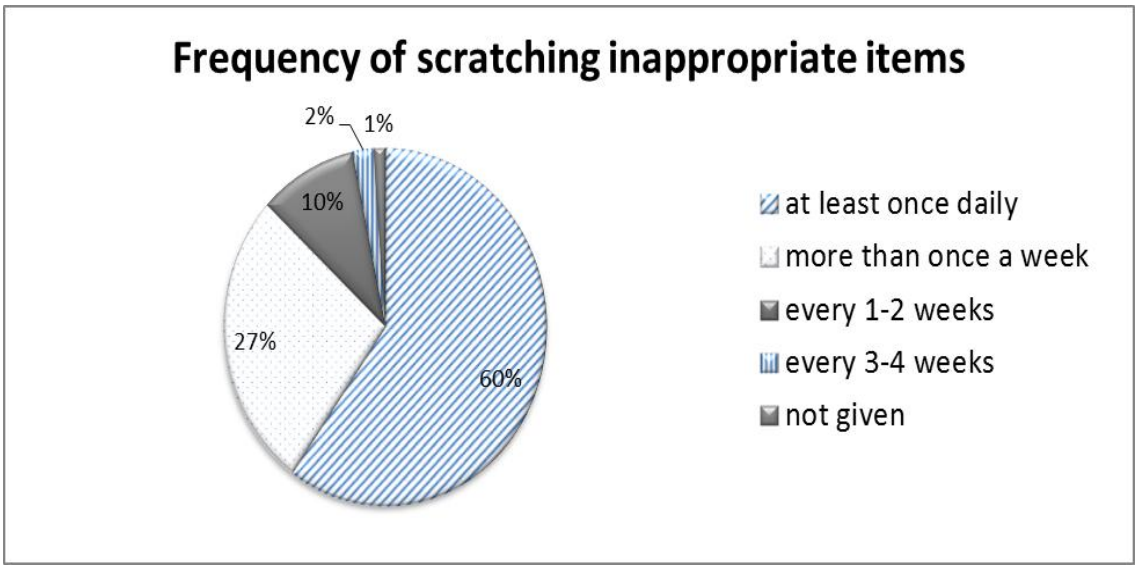

Figure 5: Frequency of scratching inappropriate items, n=88 cats.

There were significant differences in the frequency of scratching between types of inappropriate items ($p<0.0001$). Sofa/s, chair/s, tables or other furniture (type a) were scratched significantly more frequently than carpet (type b), walls or doorways (type c), drapes, curtains or other hanging textile items (type d) or other items (type e) ($p<0.0001$ for all). Carpets were scratched significantly more than walls or doorways, drapes, curtains or other hanging textile items or other items ($p<0.0001$ for all).

Table 3: Least square means of frequency of scratching of inappropriate items by type.

Least Squares Means of Frequency of Scratching of Inappropriate Items by Type						
Effect	**type**	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
Type	a	3.3718	0.1698	303	19.85	<.0001
Type	b	2.1268	0.1780	303	11.95	<.0001
Type	c	0.3827	0.1667	303	2.30	0.0223
Type	d	0.1829	0.1656	303	1.10	0.2703
Type	e	0.2644	0.1608	303	1.64	0.1012

There were significant differences in the frequency of scratching between materials of inappropriate items ($p<0.0001$). Carpeted items were scratched significantly more than cardboard, wood, leather, wicker, or other items ($p<0.0001$ all). Fabric items were scratched significantly more than cardboard ($p<0.0001$), wood ($p<0.0001$), carpeted ($p=0.0081$), leather ($p<0.0001$), wicker ($p<0.0001$) or other ($p<0.0001$) items.

Table 4: Least squares means of frequency of scratching of inappropriate items by material.

Least Squares Means of Frequency of Scratching of Inappropriate Items by Material						
Effect	**Material**	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
Material	Cardboard	0.1538	0.1432	494	1.07	0.2830
Material	Wood	0.5172	0.1464	494	3.53	0.0004
Material	Carpet	2.2692	0.1546	494	14.68	<.0001
Material	Leather	0.3412	0.1481	494	2.30	0.0217
Material	Fabric	3.0548	0.1598	494	19.11	<.0001
Material	Wicker	0.05682	0.1456	494	0.39	0.6965
Material	Other	0.09783	0.1424	494	0.69	0.4923

There was a significant effect of angle to the ground on frequency of scratching inappropriate items ($p<0.0001$). Inappropriate items that were angled vertically were scratched significantly more than those angled horizontally ($p=0.0013$) or at an angle to the ground ($p<0.0001$). Inappropriate items that were angled horizontally were scratched significantly more than those at an angle to the ground ($p<0.0001$).

Table 5: Least squares means of frequency of scratching of inappropriate items by angle.

Least Squares Means of Frequency of Scratching of Inappropriate Items by Angle						
Effect	**angle**	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
Angle	A	3.2400	0.1993	143	16.26	<.0001
Angle	B	2.2192	0.2020	143	10.99	<.0001
Angle	C	0.05747	0.1850	143	0.31	0.7565

The following answers were provided in regard to the open ended question why owners think their cat prefers the item. Most owners felt that a preference was related to the material of the scratched item. Specifically, the following materials or characteristics were mentioned as desirable: leather, wood, cloth, sisal, jute and cardboard, specific texture, especially rough fabrics or materials that sharpen nails well or grip nails and material that is thick and resistant. Backpacks and purses were mentioned as preferred scratching items as well. Some owners felt that their cats preferred the angle of the scratching item or that cats prefer long items and items that allow stretching.

A preference for attacking dangling items or playing with things that hang was named as a reason for preference of a certain item. Owners also felt that cats scratched to claim items, such as purses, bags or shoes. Several times interactions between cats were

named as reason for scratching a specific piece. For instance, owners hypothesized that the behavior may have been taught by an older cat in the household or may have been due to a cat preferring material that has the scent of other cats on it or was used by another cat. Owners also felt that cats scratched to get attention, when they wanted outside, when they were trying to get through doors or when they were trying to clean their paws.

Of 94 cats that scratched inappropriate items, 12.8 % caused more than $ 400 damage, 11.7 % caused damage in the range between $ 201 and $ 400, 12.8 between % $ 100-$ 200 and 58.5 % caused less than $ 100 damage, while 4 (4.3 %) out of 94 owners did not provide an answer to this question.

Ninety-one surveys reported answers for how owners attempted to stop scratching. Most owners (69.2 %) yelled at their cat when it scratched inappropriately or bought a designated scratching item (70.3 %). Only about a third of owners (36.3 %) placed the designated scratching item next to the inappropriately scratched item or taught the cat how to use the designated scratching item (36.3 %). Other strategies to interrupt undesired scratching behavior included spraying water (37.4 %), spanking (15.4 %), shaking a rattle can (13.2 %) or others (26.4 %). Comments under other interruptions included; clapped at cat, clapped and yelled, moved cat to other location, distracted with toys, hissed, petted, sprayed with bursts of air, saying “no” firmly, tossed a sock, made vocal noise, made noised with mouth, picked cat up, blew on cat’s face and pushed cat away or snapped fingers.

Other strategies to stop scratching of furniture included applying double sided tape or other sticky material to furniture (16.5 %), covering furniture with unattractive

material, such as plastic or foil (12.1 %), removing furniture from living space for a while (5.5 %), applying vinyl caps, such as Soft paws® (5.5 %), no strategy (2.2 %) or others (18.5 %). Comments under other included using a spray designed to keep cats away, declawing, behavior stopped once cats were older, placing obstacles in front of the scratching area, telling the cat no, buying toys to occupy cats, trimming nails, covering with blanket and tapping the nose.

There were no significant differences in frequency of scratching in cats of survey participants that attempted to teach cats to not scratch inappropriate times by any method, interruption, deterrent or remove furniture or encouraging an alternative.

Forty-four of 91 cat owners (48.4 %) received no advice on how to stop scratching, 24.2 % used the internet or books as resources, 16.5 % received advice from other cat owners, 16.5 % from their veterinarian, 4.4 % from cat shop employees and 1.1 % from cat breeders. Other sources (11.0 %) included friends, family, a veterinary technician class, trial and error and life experience.

Designated scratching item

Of 116 surveys, 3 did not report the designated scratching items. Of the remaining 113 surveys, 86 (76.1 %) reported that the cat had at least one designated scratching item available, and 27 cats (23. 9%) had no designated scratching item available. For the 86 cats that had a designated scratching item available a total of 141 designated scratching items were provided (range 1-5, mean 1.6, mean 1).

Most cats (69.8 %) had a scratching post or pole available, followed by a scratching pad (51.2 %) and other type of item (19.8 %) (Fig. 6). Other designated

scratching items included cat trees, a climbing tower, newspaper, a toy with scratch pad, a wooded door, a door frame, cardboard attached to a doorway, a cloth ball, wicker baskets, outdoor deck, carpet, an S shaped scratcher, a cardboard house and a couch.

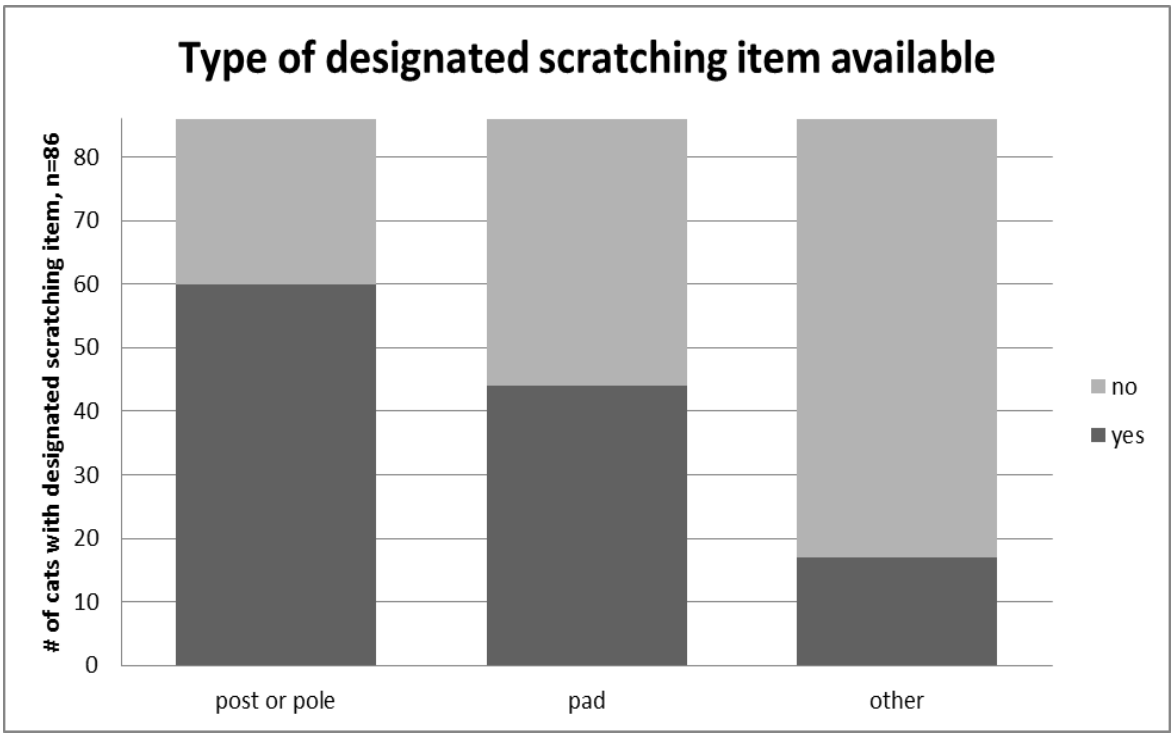

Figure 6: Number of cats having a designated scratching item available.

Designated scratching items were used by 59.3 % of the cats (51 out of 86 cats) at least once daily, by 19.8 % of the cats more than once a week, by 1.2 % every 1-2 weeks, by 2.3 % every 3-4 weeks, by 11.6 % of the cats once a months or less, by 1.2 % of cats never and 4.7 % did not provide an answer to this questions.

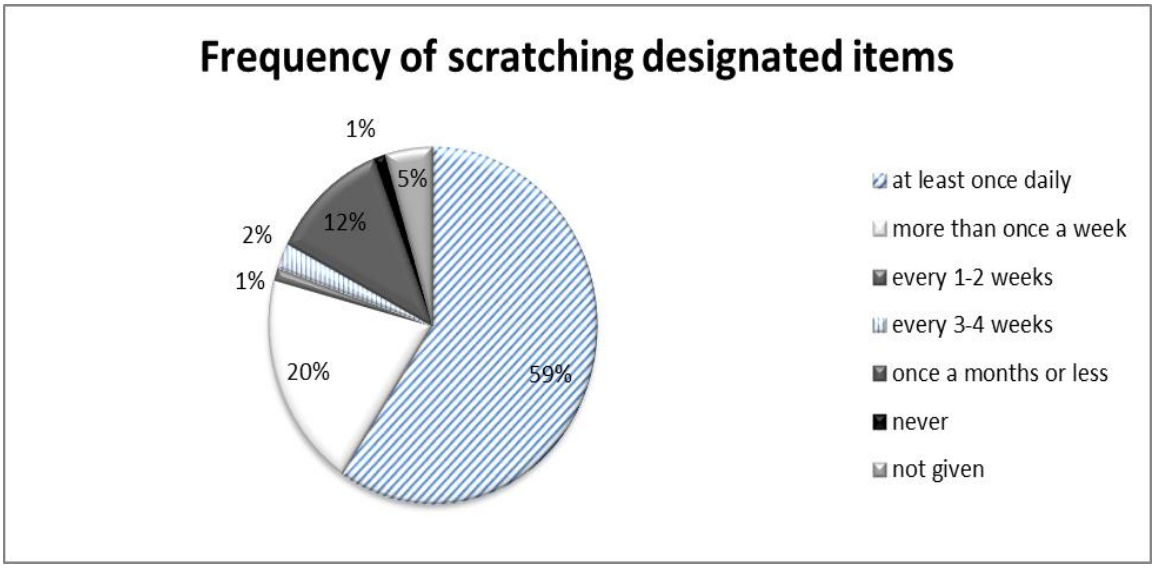

Figure 7: Frequency of scratching designated items, n=86 cats

For 7 surveys, type, material, angle, length and frequency could not be assigned to each other and they were excluded from further analysis. Data on 121 designated scratching items were available for analysis.

Twenty of 62 scratching posts (32.3 %) were made out of carpet, 19.4 % were made out of sisal rope, 20.4 % were made out of a combination of carpet and sisal rope, 9.7 % were made out of sisal fabric and the rest were made out of cardboard, burlap, a combination of several materials or the answer was not given. As expected, most scratching posts (72.6 %) were angled vertical to the ground, while 9.7 % were horizontal, 3.2 % were at an angle to the ground, 12.9 % were vertical and horizontal to the ground and for one scratching pole or post orientation was not provided. The average length of scratching posts or poles was 82.2 cm (median 62.3 cm, range 30.5 – 198.1).

Twenty-three of 39 scratchpads (59.0 %) were made out of card board and 15.4 % were made out of carpet. The remaining scratch pads were made out of sisal, wood, burlap, fabric or a combination of several materials or the answer was not given. More than half (56.4 %) of the scratch pads were angled horizontal to the ground, 25.6 % vertical, 5.1 % were at an angle to the ground, 5.1% were angled horizontally and vertically and for 7.7 % the answer was not given. Average length of scratch pads was 47.6 cm (median 45.72cm, range 12.7 – 76.2 cm).

Data on 20 other scratching items were provided and included cat trees, a climbing tower, newspaper, a toy with scratch pads, a wooden door, a door frame, a couch designated for scratching, wicker baskets, carpet designated for scratching, a cardboard house, an S-shaped scratcher, cardboard attached to a door and a cloth ball. These items were made out of cardboard, wood, carpet, sisal rope, burlap, fabric or other materials.

Items were located in the living or family room (47.1 %), in the bedroom (22.3 %), in the hallway (6.6 %), in the kitchen (5.8 %), in other rooms (TV room, outdoor deck, sun room, basement, closet - 5.8 %), in the dining room (3.3 %), in the bathroom (2.5 %), in the guest room (1.7 %) and for 5.0 % an answer was not provided.

There were significant differences in the frequency of scratching between types of designated items ($p=0.0064$). Scratching posts (a) ($p=0.0156$) and other items (c) ($p=0.0193$) were scratched significantly more than scratching pads (b). There were no significant differences in the frequency of scratching between material, angle, length or room of the designated item. The table below displays the least square means for

frequency of scratching by type of scratching item. Least square means are adjusted means for missing values.

Table 6: Least square means of frequency of scratching of designated items by type.

Least Squares Means of Frequency of Scratching of Designated Items by Type						
Effect	**Type**	**Estimate**	**Standard Error**	**DF**	**t Value**	**Pr > |t|**
Type	A	4.2242	0.1863	19	22.68	<.0001
Type	B	3.5164	0.2109	19	16.67	<.0001
Type	C	4.5716	0.3289	19	13.90	<.0001

In regard to the question of how cat owners taught their cat to use the scratching item, 49 of 86 owners (57.0 %) stated that they put their cat near the designated scratching item, 51.2 % praised them for scratching, , 44.2 % sprinkled catnip flakes over the scratching item or used catnip spray, 36.0 % took their cat's front paws and moved them over the scratching item, 22.1 % gave their cat a treat for scratching, 1.2 % used Feliway™ Spray, 29.1 % of cat owners played with their cat and a toy near the scratching area, 14.0 % played with their cat in a way that the cat touched the scratching items with its paws during play, 15.1 % tied a toy on the scratching item, 1.2 % used clicker training, 27.9 % of owners did not do any training at all and 5. 8 % of cat owners

used another technique, including scratching the item with their own nails and making a scratching noise with their own nails.

The frequency of scratching designated items was significantly lower in cats of survey participants that attempted to teach their cat to scratch these items by putting the cat near the item (yes 3.8, no 4.6, p=0.0135). There were no significant differences in frequency of scratching appropriate items in cats of survey participants that attempted to teach cats to scratch appropriate items by any other method, including catnip, praise, treat, scratched paws, or toy.

Most cat owners received no advice on how to train their cat to use the designated scratching item (55.8 %), 24.4 % received advice from books, TV or the internet, 16.3 % from other cat owners, 10.5 % from their veterinarian, 3.5 % from pet shop employees, 1.2 % from cat breeders and 5.8 % from other sources, such as friends.

Declawing

Of 116 surveys, 30 surveys did not have 100 % completion of the section regarding declaw. In 26 of the 30 incomplete surveys, the first page only of the declawing section was not completed (24 non-declawed cats, 2 declawed cats) and 4 did not complete any of the declaw portion of the survey. In total, 15 cats were declawed. Of 73 non-declawed cats and 13 declawed cats data on the amount of damage caused to furniture, people or pets were available. Of 13 declawed cats, data were available for 10 cats regarding amount of damage before and after declaw surgery. Three of the 13 cats were declawed prior to adoption by the current owner.

Figure 8 illustrates the percentage of cats causing damage to furniture. The median for 73 non-declawed cats was mild damage, and ranged from no damage at all to severe damage. The median for 13 declawed cats was no damage and ranged from no damage to mild damage. The difference between non-declawed and declawed test in regard to amount of damage to furniture caused was statistically significant (Mann-Whitney-U-Test, n_1=73, n_2=13, Z=3.5, p=0.0005) with declawed cats doing less damage to furniture.

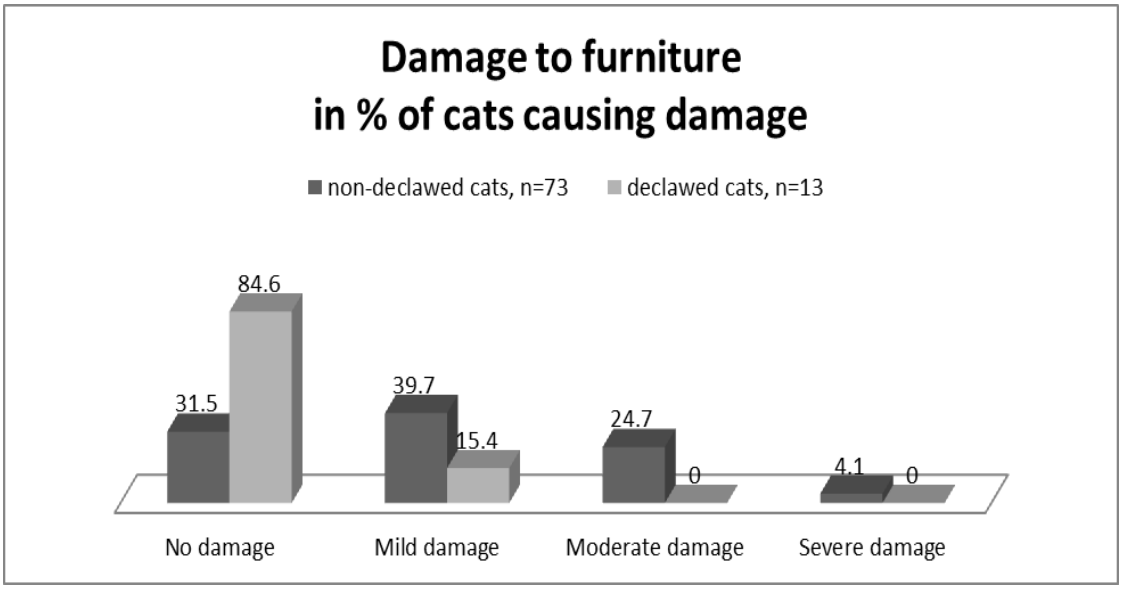

Figure 8: Percentage of cats causing damage to furniture.

Injury of pets is described in figure 9. The median for 73 non-declawed cats was no injury and ranged from no injury at all to severe injury, the median for 13 declawed cats was no injury, with no cats reported to cause injury. The difference between non-

declawed and declawed cats in regard to amount of injury to pets was statistically significant (Mann-Whitney-U-Test, n_1=73, n_2=13, Z=2.1, p=0.04).

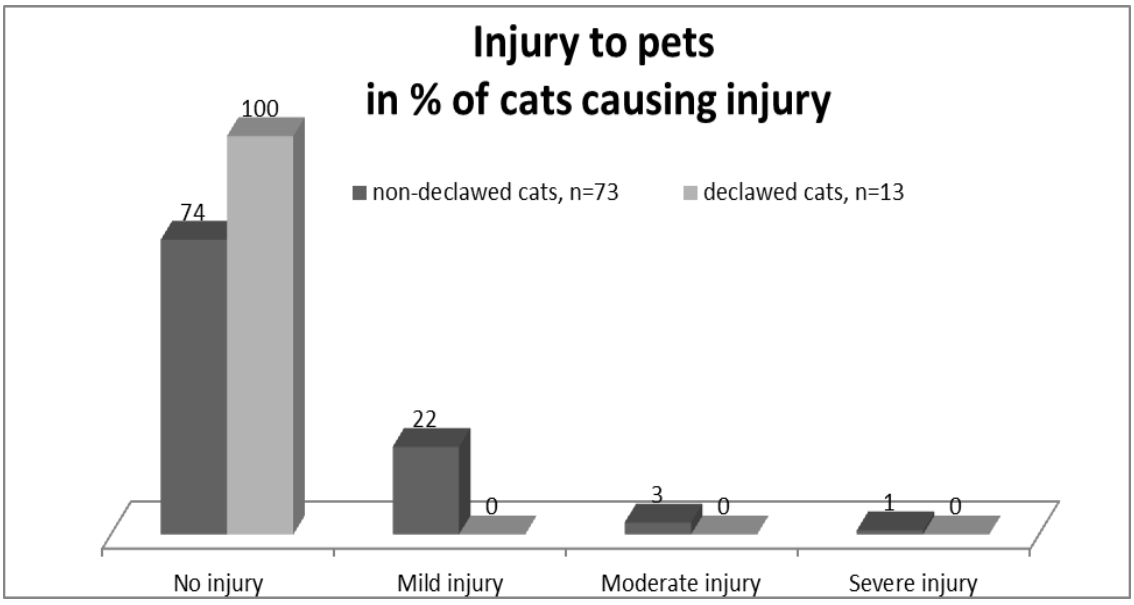

Figure 9: Percentage of cats causing injury to pets

Figure 10 gives the percentage of cats causing injury to people. The median for 73 non-declawed cats was 2 or mild injury, ranging from no injury at all to severe injury, the median for 13 declawed cats was 1 or no injury, ranging from no damage to mild injury. The difference between non-declawed and declawed cats in regard to amount of injury to people caused was statistically significant (Mann-Whitney-U-Test, n_1=73, n_2=13, Z=3.3, p=0.001).

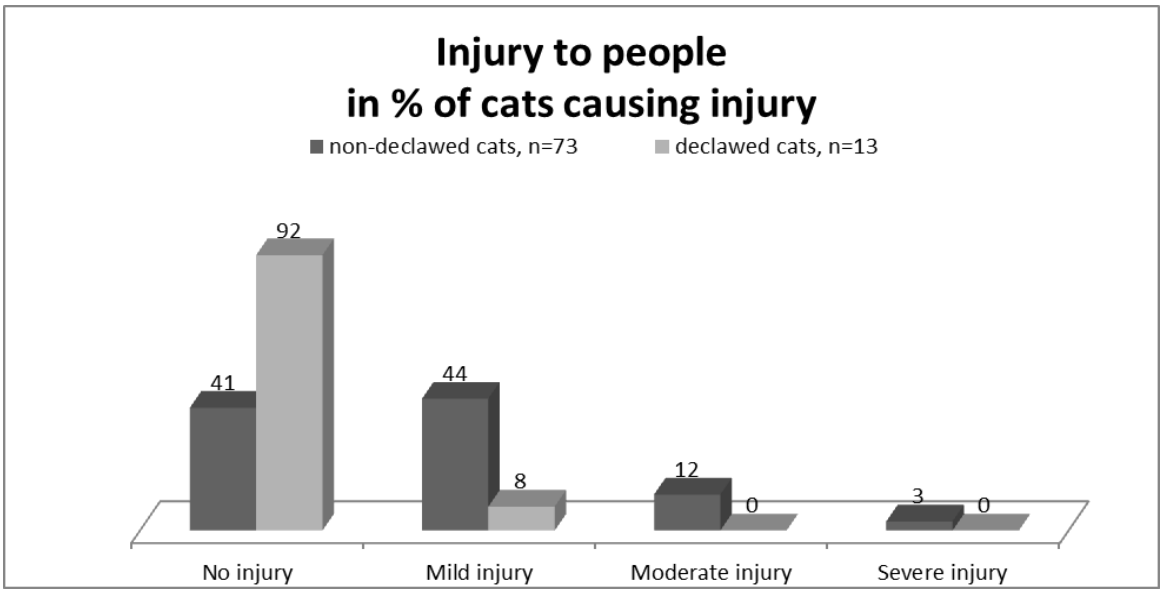

Figure 10: Percentage of cats causing injury to people

Figure 11 compares the data regarding to damage to furniture before and after declaw surgery as percentage of cats causing damage. The median damage before declaw surgery was 2.5, ranging from no damage to severe damage, the median after declaw surgery was 1 or no damage, ranging from no to mild damage. The difference between amount of damage caused before and after declaw surgery was statistically significant (Wilcoxon's signed rank test, n=10, z=2.8, p=0.005).

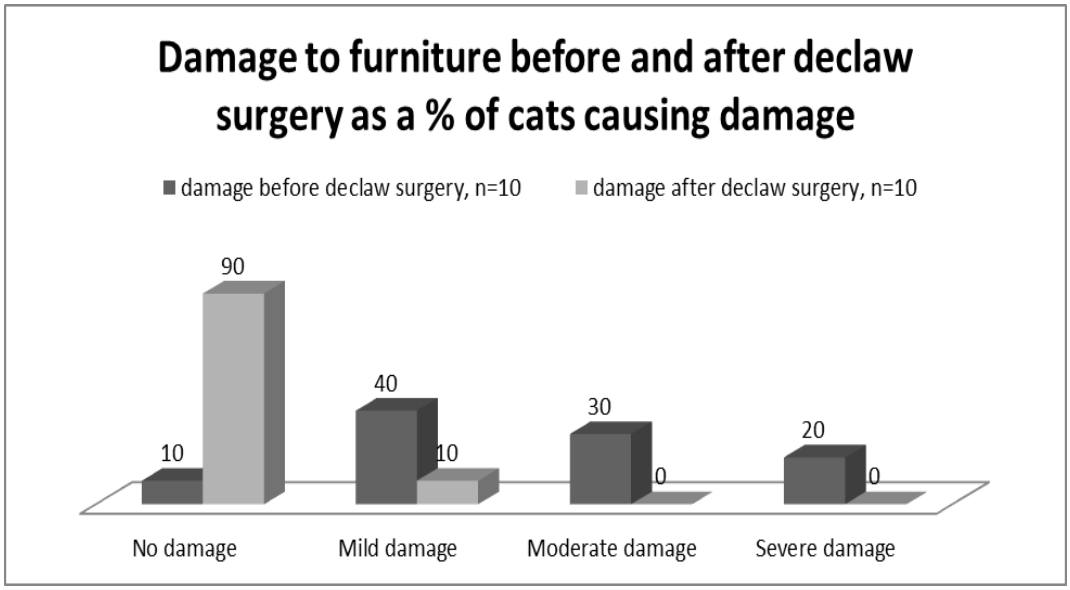

Figure 11: Percentage of cats causing damage to furniture before and after declaw surgery

Amount of injury to pets before and after declaw surgery is shown in figure 12. The median before declaw surgery was 1 or no injury, ranging from no injury to moderate injury. The median after declaw surgery was 1 or no injury, with no cat causing mild or more severe injury. There was no statistical difference between the amount of damage caused before and after declaw surgery (Wilcoxon's signed rank test, n=10, z=-1, p=0.3)

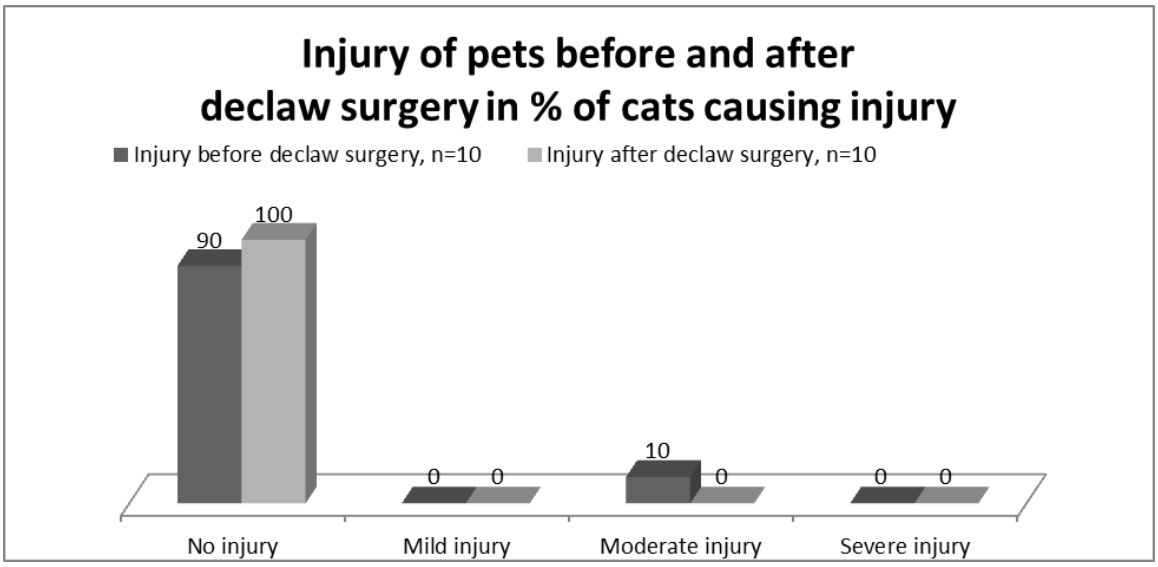

Figure 12: Percentage of cats causing injury to pets before and after declaw surgery

Figure 13 shows the reported injury to people before and after declaw. The median injury before declaw surgery was between no injury and mild injury, ranging from no injury to moderate injury. The median injury after declaw surgery was no injury, with no cats reported to cause injury. The difference between amount of damage caused before and after declaw surgery was statistically significant (Wilcoxon's signed rank test, n=10, z=2.2, p=0.03)

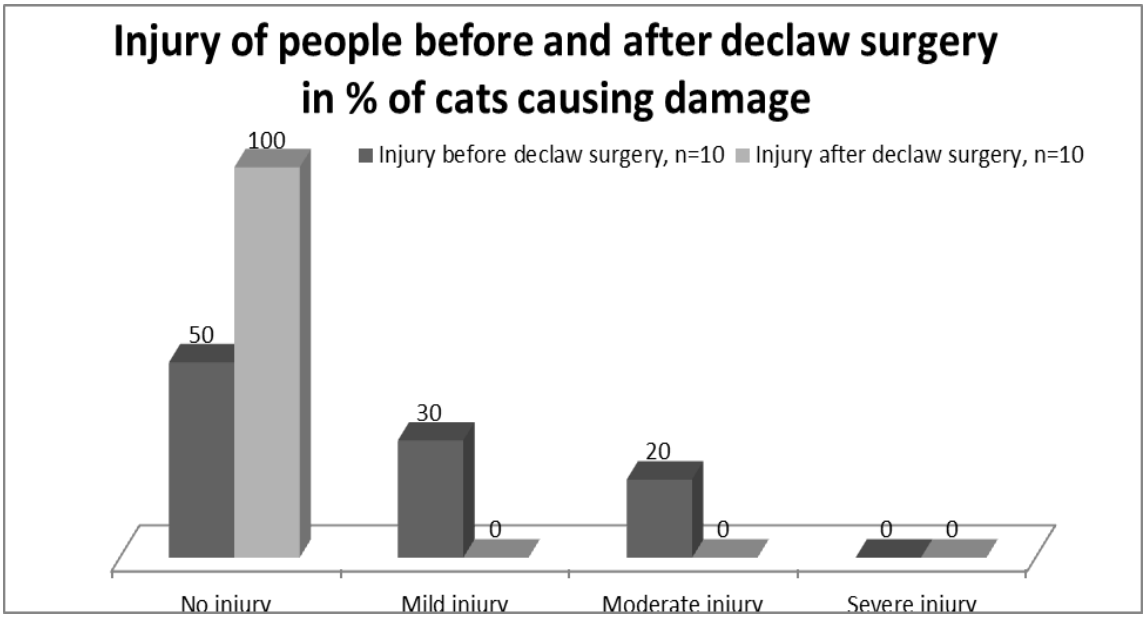

Figure 13: Percentage of cats causing injury to pets before and after declaw surgery

Of 86 surveys in which the first page was completed correctly, only one cat owner checked that someone living in their household had an increased risk for infections as a consequence of being scratched by the cat. This person owned a non-declawed cat.

Data regarding why owners had their cat declawed was available for 10 cats, as 3 out of 15 cats were declawed prior to adoption by the current owner and information for 2 cats was not provided. Most owners (7 out of 10 owners) had their cat declawed to stop scratching of furniture. Of these seven owners, 1 also reported the desire to stop the scratching of people and commented that the landlords required declawing. One also wanted to stop scratching of people and other pets.

Prevention of scratching furniture was the reason for declaw for 2 out of 10 owners. One of these also wanted to prevent scratching of people and pets and

commented that a reason for declaw was that the other cat in the household was declawed. For one owner, none of these was a reason, but declawing was performed since the previous cat was declawed.

In regard to the question what owners would have done if declawing had not been available, data could be analyzed for 11 surveys (3 cats were adopted declawed, for 1 cat information was not given). Five out of 11 owners (45.5 %) would have kept their cat in the household and allowed scratching. Two owners would have given the cat up or euthanized it. One would have made it an outdoor cat, while one owner would have tried to train it to scratch other items appropriate for scratching. One owner would have bought a scratching post and one owner would have kept inexpensive furniture.

Owners of non-declawed cats (97 surveys, 4 surveys were not completed, 15 declawed cats) gave the following answers in regard to the question why their cat was not declawed: The majority (55.7 %) was concerned about adverse effects or felt that declawing was wrong (66.0 %), 30.9 % stated that their cat was not destructive. Outdoor access was a reason for 24.7 % of cat owners to not declaw their cat and 21.6 % highlighted "other" as a reason. Other reasons included that declawing was not necessary, as other techniques, such as nail trimming or soft paws were effective enough to prevent scratching, that owners felt that scratching is part of the natural behavior repertoire of cats, that they opted against declaw as the veterinarian did not recommend it, or as the owner felt that declawing was wrong.

Only a small percentage (7.2 %) would declaw their cat if their cat started to scratch, while 39.2 % of owners stated that they would not declaw their cat if the cat

started to scratch. Cost was an issue for 6.2 % of owners, as they stated that they could not afford the declaw surgery.

Owners had the opportunity to provide additional comments at the end of the survey. Comments of owners of declawed cats included that they had no problems as a consequence of declaw surgery, but would not declaw again, or that the cat still exhibited scratching behavior although declawed. Two owners of cats adopted declawed explicitly stated that their cat being declawed was not their decision.

Some owners of non-declawed cats stated that declawing should be illegal, is cruel, an animal welfare concern, barbaric and that veterinarians should discourage declaw surgery. One owner reported that she had a cat declawed that suffered from pain for years after the surgery. Another owner stated that she would prefer to not have her cat declawed but would do it if her husband gets too concerned about destruction in the house. Another owner stated that he/she would love to declaw if he/she was not so concerned about pain after surgery. Several owners emphasized the importance of appropriate training, socialization and providing alternatives to scratching inappropriate items as well as regular nail trimming and that scratching is a natural behavior/need in cats. Several owners stated that cats need their claws to be able to defend themselves if they have access to the outdoors.

Chapter 4: Discussion

Study design

A number of limitations are inherent in a survey study (Fowler, 2008). The survey for cat owners was only distributed in one practice that was different from other practices in several aspects. First, the practice was associated with a university. Clientele might be somewhat different in that people associated with the university might be more likely to bring their pet to this than to other practices. Therefore, clients might have been more educated about feline behavior than the average client and might suffer less from financial constraints. An attempt to control for this by including several practices in the Athens area was made with the initial study, but was unsuccessful due to low response rates.

Surveys were given out to 29.9 % percent of clients. It is unclear if students did not give the survey out to the remainder of the clients or if the clients declined. It is possible that clients with declawed cats or clients whose cats caused a lot of damage to furniture were uncomfortable with the topic and therefore more likely to decline a survey. This could have caused bias. It is also possible that students chose to give the survey only to clients that appeared more approachable or more interested in the topic, therefore causing bias. Due to the unique set up of the clinic, with students performing the majority of the procedures and associated longer wait times for the clients, most clients seem to be willing to use this time to fill out the survey. Therefore, effect of selection bias was hopefully low and the discrepancy between the number of clients visiting the practice and

of clients receiving a survey may have been caused by students forgetting to give out the survey.

The percentage of cats being neutered is representative of the general cat population, with about 85 % of cats being neutered (Patronek, 2001). Range and median of age of cats appears to be representative of the general population as well.

The survey design appeared to be confusing for some clients, as reflected by the rather high number of tables filled out incorrectly. Also, the first page of the section on declawing was not filled out in 22 % of surveys. This may have been due to the sensitivity of the topic. However, as the second page of this section, which included multiple choice questions, was filled out in these surveys, and as the first page contained several tables it is more likely that owners were unclear about how to complete this page. We attempted to test survey design with a small pilot study with 7 veterinary students who had no problems with the survey design. However, veterinary students might have taken more time to read the instructions than the average cat owner or might have been more familiar with the topic.

A lot of the data collected was subjective (such as amount of damage caused – mild, moderate, severe). In addition, recall bias is unavoidable in a self-reporting survey (Fowler, 2008). For example, we hypothesize that owners are less likely to report aversive training techniques, such as yelling at the cat for fear of being judged.

Survey of veterinary general practitioners about attitude towards declawing

The AVMA policy on declawing suggests that "declawing of domestic cats should be considered only after attempts have been made to prevent the cat from using its

claws destructively or when its clawing presents a zoonotic risk for its owner(s)"(AVMA, 2009). However, the majority of practices agreed upon that they explain alternatives to declawing to clients, but are willing to declaw without any attempts by the client to try alternatives, thereby not following the AVMA guidelines.

One practice each stated that they declaw cats upon clients request without advising the client of alternatives and that they require the client to attempt at least one alternative strategy before declaw surgery, while another practice stated that the decision depended on the situation. Our results are consistent with other findings that attitudes of veterinarians towards declawing vary, with some veterinarians being uncomfortable with their participation in the procedure (Atwood-Harvey, 2005; Fox, 2006). The debate is often emotional, with arguments pro or con on declawing derived from personal experiences with single cases (Anonymous, 1961; Miller, 1998; White, 1998). This may be partly due to the lack of data to either support or refute contentions of adverse long-term health and behavioral outcomes (Patronek, 2001).

A wide variety of surgery techniques to perform onychectomies were reported in our study. Surgery technique seemed to be dependent on surgeon's preference. Interestingly, two practices referred for declaw surgery to another practice that offers laser surgery, although evidence for laser technique actually being superior is limited (Holmberg and Brisson, 2006; Mison et al., 2002). Tendonectomy has been discussed as a recommended alternative to onychectomy based on owner evaluations of complications (Yeon et al., 2001), although regular claw trimming is necessary (Jankowski et al., 1998; Yeon et al., 2001). Jankowski et al. (1998) did not find any significant difference in owner satisfaction 5 months after surgery for tendonectomy (70%) compared to

onychectomy (89%). Two owners of tendonectomized cats elected to have their cats declawed later, as they were unsatisfied with the outcome of tendonectomy surgery. The American Veterinary Medical Association does not recommend tendonectomy as an alternative to onychectomy (Anonymous, 2006). This, combined with the inconvenience of regular nail trimming and possible adverse effects, if owners do not or are not able to perform regular nail trims, may contribute to veterinarians in our study not offering this procedure anymore.

The numbers of neuter surgeries in our study were very low. Most practices commented that surgery numbers had decreased and attributed this due to a nearby low cost neuter practice.

Survey of cat owners on feline scratching of household items, owners' attempts to prevent it and owner attitudes towards declawing

Scratching of inappropriate items

More than 80 % of cats scratched inappropriate items. This number is higher than the results of Morgan (1989) with 42 % of cats scratching furniture. Morgan (1989) conducted an online survey, thereby possibly receiving skewed results as cat owners that were especially interested in the subject may have been more likely to respond. In general, online surveys may interest a special group of people that may not be representative of the average population (Fowler, 2008).

Most cats preferred furniture for scratching. Unfortunately we could not collect data on the amount of items scratched. As an indoor environment may provide more opportunity to scratch furniture items than door frames or hanging textile items this may

have biased the results. Fabric items were preferred over other items. This is interesting, as fabric is a man-made material and different from tree bark or dirt that may be scratched outdoors (Landsberg, 1991c). However, fabric may allow cats to hook their claws into the fabric and tear it up, as empirically observed by Landsberg (1991c).

Carpet as a type and material was another preferred scratching object. Carpet and fabric have similar attributes in that they are softer than wood and may allow for greater destruction or visual marking. It is unclear if they keep scent better than other materials.

Cats appeared to prefer items that were vertical to the ground. This is consistent with observations outdoors where cats often scratch vertical objects (Landsberg, 1991c; Overall, 1998b). Objects angled to the ground were the least preferred.

The amount of damage caused was rated as less than $ 100 by the majority of owners. However, over a fourth of all cat owners felt their cats caused more than $ 200 damage. Interpretation of this information is somewhat limited as no further information was collected on how owners evaluated the amount of damage caused.

Statistically, no significant differences between strategies in regard to frequency of scratching were found. However, as we did not collect data pre and post attempts to stop scratching, and as it is unclear if the owners followed one approach consistently or not, further investigation on the effectiveness of certain attempts are necessary.

In regards to attempts to stop inappropriate scratching, most owners opted for positive punishment (yelling at the cat). As punishment needs to happen every time the undesired behavior occurs and not only when the owner is present, shouting at the cat does not meet the criteria for effective punishment (Beaver, 2003; Overall, 1998a). Other frequently used strategies to interrupt scratching included spraying water, spanking the

cat, shaking a rattle can or other interruptions by the owner that did not meet the criteria for effective punishment. Strategies that should be more effective, such as preventing the cat from scratching inappropriate items by removing furniture, making furniture less attractive for scratching by covering it with an unattractive material or double sided tape - as suggested by Landsberg (1998c)- were less common.

Although veterinarians should educate owners about preventative behavioral health, only a small portion of the cat owners received advice from their veterinarian. We did not collect data on previous visits and therefore do not know if the client had brought the cat to a veterinarian before. For clients that chose the CPC as their primary care veterinarian, the results may have been confounded as the survey was performed at a teaching hospital. Senior students may be less time effective than experienced veterinarians, and therefore less likely to spend time with discussing prevention of behavior problems. On the other hand, it seems likely that veterinarians who do not practice education about behavior health during veterinary school will not implement it in general practice later on. The most common source of advice was the internet or books. Volk et al. (2011) found that 39 % of pet owners look online first if a pet is sick or injured. Therefore, pet owners may not only seek medical, but also behavioral advice online, before they talk to their veterinarian. Online information may be flawed. These results demonstrate the importance of easy to use behavioral information for veterinarians.

Scratching of designated items

Most cats had at least one designated scratching item. Cats preferred scratching posts and other scratching items over scratch pads. Although cats did not prefer a certain angle when data were analyzed for this factor, scratching posts were usually angled vertically to the ground, while more than half of scratch pads were angled horizontally. As cats preferred vertical objects for scratching in regard to inappropriate items preference for scratching posts may, in fact, be a preference for vertical objects. Other scratching items were often chosen by the cat (couch, door frame, newspaper, cloth ball, wicker baskets) and then retrospectively assigned as a designated scratching item by the owner. Cat trees and climbing towers were also included under others. They probably resemble most scratching posts, thereby supporting our results that scratching posts are preferred.

Interestingly, cats did not show a preference for a certain material. A wide variety of materials were available. However, not all cats had all materials available. Carpet and sisal were the most frequently used materials for scratching posts. Cardboard was most frequently used for scratching pads. It is unclear if the non-preference for scratch pads is due to angle, cardboard being a less effective material for scratching, or possibly the smaller size of scratch pads. Also, cats appear to prefer objects that are stable for scratching and this criteria may be more commonly fulfilled with scratching posts than with scratch pads (Landsberg, 1991c).

Most owners placed scratching items in the living or family room or in the bed room, thereby in a frequently used area as recommended by Landsberg (1991c). Therefore, it is important that designated scratching items not only offer desired attributes

to encourage scratching but also meet owners' expectations in regard to appearance. Only about a third of owners placed the designated scratching item next to the inappropriately scratched item, although most cats develop a preference for a certain location and putting the designated item right next to the inappropriately scratched item is recommended (Landsberg, 1991c). This finding again indicates the importance of educating owners about effective strategies to encourage appropriate scratching behavior.

Owners that put their cats near the designated scratching items appeared to be less successful in teaching their cat to use the item. Several explanations are possible. Some cats may not appreciate being picked up and placed near an item and may possibly learn an aversion to the item. To teach a cat to use a certain designated scratching item it is important that the item is placed near a location where the cat has scratched before. Owners that had to pick their cat up and place it near the designated item might have placed the item in a less accessible location, therefore reducing the likelihood of the cat scratching the object on its own. However, statistical analysis of this part of the survey has to be interpreted with caution, as data pre- and post-intervention were not collected. It is possible that owners of cats that did not use the designated scratching item on their own engaged in several different attempts to teach the cat how to use the item. On the other hand, if owners picked a desirable scratching item for their particular cat, they might have not felt the need to attempt any training as the cat performed scratching behavior in a high frequency without it.

It is interesting to note that although most owners bought a designated scratching item, most owners did not attempt to introduce the item to the cat. It is likely that strategies that do not include physical manipulation of the cat, such as picking it up or

scratching its paws over the item, are more effective in teaching the cat. However, only about a third cat owners introduced their cat to the scratching item with toys, while about 44 % used catnip. It appears that owners are not educated about appropriate strategies to teach cats to use a designated scratching item. This is not surprising, considering that advice on how to teach a cat to use a designated scratching item was scarce, with the internet being the main source of advice.

Declawing

At 12.9 % of the population, the percentage of declawed cats was lower than the approximately 25 - 50 % previously reported (Dohoo and Dohoo, 1996; Patronek, 2001; Wagner and Hellyer, 2000). Declawing has been discussed as a controversial topic in recent years and it is possible that this is reflected by a decrease in numbers of declawed cats. It is also possible that owners of declawed cats were less willing to fill out a survey on feline scratching behavior, although the client information letter clearly stated that declawed cats were included in the study.

Only 6 of 11 cats were declawed at time of neuter surgery while the remainder of cats were declawed at a later date. Compared to previous studies that reported between 21.8 % and 27.6 % of cats being neutered and declawed at the same time (Bennet, 1988; Pollari et al., 1996), this percentage appears low. Cats not declawed at the time of neuter tended to be older. An increase of age at time of declaw may be due to the owners attempting more behavior modification to address undesired scratching behavior before proceeding to declaw surgery.

As expected, declawed cats caused less damage to furniture, injury to pets and injury to people. Also, declawing was effective in reducing damage to furniture and injury to people when comparing data pre and post surgery.

Interestingly, although often discussed as a reason for declaw surgery(Atwood-Harvey, 2005; Landsberg, 1991a, b, c; Miller, 1998; Yeon et al., 2001), none of the owners of a declawed cat checked that someone living in their household had an increased risk for infections as a consequence of being scratched by the cat. This result, however, is possibly biased, as some owners may have been reluctant to divulge personal information, such as this fact, although no identifying data were collected.

Consistent with findings in the literature (Bennet, 1988; Landsberg, 1991a, b), all but one owners that made the decision to declaw their cat made the decision to prevent (2 out of 10 owners) or stop (7 out of 10) scratching of furniture. Another common reason was reducing injury to people, again reflected in the literature with 29 % of people in one study declawing their cat due to this reason (Landsberg, 1991a)**.** One owner's only reason to declaw their cat was due to the other cat in the household being declawed.

Owners that had one declawed cat in a multi-cat household had significantly more other declawed cats than owners for whom the survey cat was not declawed, again suggesting that decision for declaw surgery may be more affected by the owner's preference than actual damage caused.

Although declawing is often discussed as a last ditch effort in preventing surrender or euthanasia of owned cats (Landsberg, 1991b; Morgan, 1989), only 2 out of 11 owners would have opted for this, while one owner would have made his or her cat an outdoor cat.

Attitudes of cat owners towards declawing varied widely and reflected the whole spectrum of views. In one study the majority of owners that opted for onychectomy or tendonectomy in their cats had a positive attitude regarding surgery after the immediate postoperative period (Yeon et al., 2001). A recent poll revealed that over a third of 1000 polled pet owners disagree with declaw surgery (Manning, 2011). Most of the owners of non-declawed cats were concerned about adverse effects or that their cats could not defend themselves when allowed outdoors. Two studies found that declawed cats were not less likely to have outdoor access than non-declawed cats (Clancy et al., 2003; Landsberg, 1991a). At least one study reported no problems with self-defense in declawed cats having outdoor access (Landsberg, 1991a).

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Appendix A: Questionnaire for veterinarians about attitude towards declawing

Address of Veterinary Clinic
(Individualized questionnaire)

How many spays and neuters in cats <u>without declawing the cat at the same time</u> do you perform on average per month?
_____surgeries per month

How many spays and neuters in cats <u>with declawing the cat (front feet or all feet)</u> do you perform on average per month?

_____surgeries per month

Do you perform Tendonectomy surgery in conjunction with spay/neuter surgery?

0 Yes,_____ surgeries per months 0 No

Please give the following information about the veterinarians working in your practice: (Please do not list relief veterinarians.)

Position, e.g. practice owner, partner, associate)	Sex	Age in years	Time working as a veterinarian in years
EXAMPLE Practice owner	Male	65 years	40 years

What is your practice philosophy about declawing? Please choose only one answer. Please check the answer most of the veterinarians working in your practice would agree on. Please comment below.

0 We declaw cats upon client request without advising the client of alternatives.

0 We explain alternatives to declawing to clients, but are willing to declaw cats without any attempts by the client to try alternatives.

0 We give information on alternatives to clients and require that the client attempts at least one alternative before we perform the declaw procedure.

0 We absolutely refuse to declaw cats under any and all circumstances.

If you perform declaw surgery, which of the following techniques do you use? Please check all that applies.

0 Laser
0 Radiofrequency
0 Blade
0 Nail Trimmers
0 Other. Please state_____

Comments?

_____
_____
_____
_____

Thank you very much for your participation.

Appendix B: Questionnaire for veterinarians about numbers of spay/neuters with and without declaw

Address of Veterinary Clinic Athens,….
(Individualized questionnaire)

Dear staff of….,
thank you for participating in the "Survey on feline scratching behavior" by the University of Georgia Veterinary Behavior Service.
The survey period ended on 4/23/2011. If you were able to collect one or more questionnaires, please put them in the enclosed self-addressed and stamped envelope and send them to the University of Georgia Behavior Service.
In addition we would appreciate, if you could provide us with the following information. If you do not have the information, please return the surveys anyway.

1) **During survey period – 2/28/2011 - 4/23/2011**

	Total number of cats	**Of total number of cats, cats "owned" by rescue including those adopted but not yet brought home at time of surgery**
Female cats spayed		
Declawed at the time of spay		
Male cats neutered		
Declawed at the time of neuter		
Female cats declawed without concurrent spay surgery		
Male cats declawed without concurrent neuter surgery		

2) During last year - 5/1/2010 – 4/30/2011

	Total number of cats	**Of total number of cats, cats "owned" by rescue including those adopted but not yet brought home at time of surgery**
Female cats spayed		
Declawed at the time of spay		
Male cats neutered		
Declawed at the time of neuter		
Female cats declawed without concurrent spay surgery		
Male cats declawed without concurrent neuter surgery		

Please fill out the tables and use the envelope provided to send the information back to the University of Georgia Behavior Service.
Thank you again for participating in this survey.
If you want to receive further information on the outcome of the study please check here. ( )

Alexandra Moesta, Dr. med. vet., Behavior Resident

Veterinary Behavior Service
College of Veterinary Medicine
University of Georgia

Appendix C: Questionnaire for cat owner

1. Information about cats in household

Please complete the following table for the cat you presented to the Community Practice Clinic today.

Name of cat *(you can also assign a nick name or number)*	Age in years *(if younger than a year: age in months)*	Living in your home since what age?	Sex *Please circle one*	Neutered/ spayed? *Please circle one*	Is your cat declawed? *Please circle one*	If declawed: *Please circle one*	If declawed: Was your cat declawed at time of neuter/spay? *Please circle one*	If declawed: Age at which declawed?	Lifestyle *Please circle one*
			Male Female	Yes No	Yes No	front feet only all four feet	Yes No		indoor indoor/outdoor outdoor

If you have more than one cat, please fill out the following table for all other cats currently living in your home. If you have more than five cats, please fill out the table for the most recently acquired cats..
(Do not fill in data for deceased cats.)

Name of cat *(you can also assign a nick name or number)*	Age in years *(if younger than a year: age in months)*	Living in your home since what age?	Sex Male Female	Neutered/ spayed? Yes No	Is your cat declawed? Yes No	If declawed: front feet only all four feet	If declawed: Declawed at time of neuter/spay? Yes No	If declawed: Age at which declawed?	Lifestyle indoor indoor/outdoor outdoor

PLEASE ANSWER THE FOLLOWING QUESTIONS ONLY FOR THE CAT YOU PRESENTED TO THE COMMUNITY PRACTICE CLINIC TODAY! If you are presenting more than one cat to the CPC today, please fill out the questionnaire for the youngest cat.

2. Scratching of inappropriate items

Did your cat scratch any items not designated for scratching (inappropriate items) since adopted? Please circle one answer.

A) No.→ Please move on to section 3. B) Yes. → Please complete the following table.

What inappropriate items (items not designed for scratching) has your cat scratched? Please fill out one line per each inappropriate item scratched by your cat.

Type of scratching item A) sofa/s, chair/s, table/s or other furniture B) carpet C) wall/s or doorway/s D) drapes, curtains or other hanging textile items E) other (please specify)	Material of scratching item A) cardboard B) wood C) carpet D) leather E) fabric F) wicker G) other (please specify)	How is the surface your cat scratches mostly angled to the ground? A) vertical (e.g. the side of sofa) B) horizontal (e.g. carpet) C) angle to the ground (see laminated card for explanations)	How often did your cat scratch this item? A) At least once daily B) More than once a week C) Every 1-2 weeks E) Every 3-4 weeks F) Once a month or less	Why do you think your cat prefers this item? e.g. - prefers the material - long item - was used by other cat before *Please note why you think your cat prefers this item.*
EXAMPLE Ⓐ	Ⓓ	Ⓐ	Ⓑ	likes leather items for scratching

What amount of damage was caused? Please consider all items you had to replace due to being damaged by scratching AND the loss in value of items you did not replace. (Please circle one answer.)

A) More than 400 $ B) 201-400 $

C) 100-200$ D) Less than 100 $

How did you try to stop your cat scratching inappropriate items? (Please check all that apply, even if what you attempted was not successful in interrupting the scratching behavior.)

0 Yelled at cat when scratching
0 Sprayed water at cat when scratching
0 Spanked cat when scratching
0 Shook a rattle can or another device which makes an unpleasant sound at cat when scratching
0 Other interruption, please specify_____
0 Covered furniture with unattractive material, such as plastic or foil
0 Applied double sided tape or other sticky material to furniture
0 Removed furniture preferred for scratching from living space for awhile
0 Applied vinyl nail caps, such as Soft paws®, on my cat's nails
0 Bought designated scratching items
0 Placed designated scratching item next to inappropriate scratching item
0 Taught cat to use designated scratching items
0 None of the above
0 Other, please specify_____

vinyl caps

Who gave you advice on how to stop your cat scratching inappropriate items? (Please check all that apply.)

0 Veterinarian 0 Pet Shop employee 0 Books, TV, Internet
0 Cat breeder 0 Cat owners 0 None received
0 Other, please specify_____

3. Designated scratching items

The following section refers to the items your cat is supposed to scratch (designated scratching items).

Does your cat have any designated scratching items currently available? Please circle one answer.

A) No. → Please move on to section 4. B) Yes. → Please complete the following table.

The following table refers to the items your cat is supposed to scratch (designated scratching items). Please list all items your cat has currently available. Please fill out one line per designated scratching item your cat has available.

Type of scratching item A) scratching post or pole B) scratching pad C) other (please specify) *Please see laminated card for explanations*	**Material of scratching item** A) cardboard B) wood C) carpet D) sisal fabric E) sisal rope F) burlap G) fabric H) other (please specify)	**How is the surface of your cat's scratching item angled to the ground?** A) vertical B) horizontal C) angle to the ground *Please see laminated card for explanations*	**What is the approximate length of the scratching item in inches?**	**How often does your cat use this scratching item?** A) At least once daily B) More than once a week C) Every 1-2 weeks D) Every 3-4 weeks E) Once a month or less	**In which room is the scratching item located?** A) living or family room B) bed room C) guest room D) hall way E) kitchen F) dining room G) bathroom H) other (please specify)	**Why do you think your cat prefers this item?** e.g. - prefers the material - long item - was used in conjunction with cat nip - was used by other cat before . . .
EXAMPLE Ⓐ	Ⓑ	Ⓐ	40 inches	Ⓐ	Ⓐ	has a toy hanging from the top

How did you teach your cat to use the scratching items? (Please check all that apply, even if what you attempted was not successful in teaching your cat to use the scratching items.)

0 No training
0 Sprinkled catnip flakes over scratching items or used catnip spray
0 Used Feliway Spray
0 Praised him/her for scratching
0 Gave him/her a treat for scratching
0 Clicker training
0 Put him/her near scratching area
0 Took his/her front paws and scratched them over scratching post
0 Tied a toy on scratching item
0 Played with my cat and a toy near the scratching area
0 Played with my cat in a way that he/she touched the scratching items with his/her paws during play
0 Other, please specify_____

Who gave you advice on how to stop your cat scratching inappropriate items? (Please check all that apply.)

0 Veterinarian
0 Cat breeder
0 Other, please specify_____
0 Pet Shop employee
0 Cat owners
0 Books, TV, Internet
0 None received

4. Declawing

Please circle "Before" or "After" in the column that best describes your cat. The terms None, Mild, Moderate and Severe refer to how much damage or injury your cat has caused. If your cat is not declawed, please circle only the "Before" section of the table. If your cat is declawed, please circle the term that best describes your cat's behavior the time before and after declaw surgery.

	None	Mild	Moderate	Severe
Damage to furniture and household item	Before	Before	Before	Before
	After	After	After	After
Injury of people with claws	Before	Before	Before	Before
	After	After	After	After
Injury of pets with claws	Before	Before	Before	Before
	After	After	After	After

Please check, if applicable:
0 Someone living in my household has an increased risk for infections as a consequence of being scratched by my cat
(e.g. immunosuppressed person, person suffering from Diabetis mellitus or other disease)

If you (and not the previous owner) decided to have your cat declawed, please fill out the rest of this page. If your cat is not declawed, please continue on the next page (page 7).

I decided to have my cat declawed … Please circle one box per row

To prevent scratching of household items BEFORE my cat started to scratch household items	To stop scratching of household items AFTER my cat started to scratch household items	Scratching of household items was not a reason to have my cat declawed
To prevent injury of people by my cat's claws BEFORE my cat started to injure people	To stop injury of people by my cat's claws AFTER my cat started to injure people	Injury of people was not a reason to have my cat declawed
To prevent injury of pets by my cat's claws BEFORE my cat started to injure pets	To stop injury of pets by my cat's claws AFTER my cat started to injure pets	Injury of pets was not a reason to have my cat declawed

0 I had my cat declawed for another reason. Please specify_____

If declawing had not been available, what would you have done to solve the scratching problem? (Please circle one answer.)
A) Kept him/her in the household and allowed the scratching
B) Not kept him/her in the household (Surrender to shelter, finding another home or euthanasia)
C) Other (please write in what you would have done)_____

If your cat is not declawed, please check all that apply.

My cat is not declawed…

0 because he/she has not been destructive with his/her claws

0 because I could not afford the declaw surgery.

0 because my cat has access to the outdoors and therefore he/she needs his/her claws.

0 because I was concerned about adverse effects such as pain or postoperative complications.

0 because I feel that declawing a cat is wrong.

0 Other. Please specify_____

0 I might have him/her declawed in the future, if he/she scratches furniture, people or other pets.

0 I will not get him/her declawed in the future, even if he/she scratches furniture, people or other pets.

ANY OTHER COMMENTS?

_____

_____

_____

_____

Thank you very much for your time and efforts!

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