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Reasons People Surrender Unowned and Owned Cats to Australian Animal Shelters and Barriers to Assuming Ownership of Unowned Cats

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ABSTRACT

Most cats surrendered to nonhuman animal shelters are identified as unowned, and the surrender reason for these cats is usually simply recorded as “stray.” A cross-sectional study was conducted with people surrendering cats to 4 Australian animal shelters. Surrenderers of unowned cats commonly gave surrender reasons relating to concern for the cat and his/her welfare. Seventeen percent of noncaregivers had considered adopting the cat. Barriers to assuming ownership most commonly related to responsible ownership concerns. Unwanted kittens commonly contributed to the decision to surrender for both caregivers and noncaregivers. Nonowners gave more surrender reasons than owners, although many owners also gave multiple surrender reasons. These findings highlight the multifactorial nature of the decision-making process leading to surrender and demonstrate that recording only one reason for surrender does not capture the complexity of the surrender decision. Collecting information about multiple reasons for surrender, particularly reasons for surrender of unowned cats and barriers to assuming ownership, could help to develop strategies to reduce the number of cats surrendered.

KEYWORDS

Cat surrender; unwanted cat problem; shelter medicine; animal welfare; reasons for cat surrender

Millions of cats are surrendered to nonhuman animal shelters around the world every year and many are euthanized. The American Society for the Prevention of Cruelty to Animals (ASPCA) reported that approximately 3.4 million cats enter animal shelters in the United States every year and that approximately 1.4 million are euthanized (ASPCA, 2015). In 2012 and 2013, more than 49,000 cats were surrendered to Australian Royal Society for the Prevention of Cruelty to Animals (RSPCA) shelters alone and 39.5% were euthanized (RSPCA Australia, 2013). A study from the United Kingdom estimated that in 2010 and 2011, 131,070 cats entered UK welfare organizations, and of these, 5,064 were euthanized (Clark, Gruffydd-Jones, & Murray, 2012).

The proportions of shelter admissions classified as “stray” versus “owned” vary between shelters, regions, and countries, but the majority of reports worldwide indicate equal or greater proportions of stray cats compared with owned cats (Alberthsen et al., 2013; ASPCA, 2015; Casey, Bradshaw, Roberts, & Vandenbussche, 2009; Marston & Bennett, 2009; Miller, Staats, Partlo, & Rada, 1996; New et al., 2000). The large number of unwanted cats and the resulting euthanasia of healthy animals result in financial (Alberthsen et al., 2013; Australian Companion Animal Council, 2009), social, and moral costs (Baran et al., 2009; Regan, 1983; Rogelberg et al., 2007; Rohlf & Bennett, 2005), as well as welfare

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issues for the cats (Griffin, 2001), thereby highlighting the need for more research to address unwanted cat issues (Griffin, 2001).

Most research into reasons for cat surrender has been conducted in the United States (Coe et al., 2014), and although reports relating to cat surrender in Australia are available (Alberthsen et al., 2013; Marston & Bennett, 2009), there is little published information on reasons for cat surrender. It is likely that there are geographical differences in reasons for companion animal relinquishment (Coe et al., 2014), possibly as a result of cultural, environmental, economic, and social differences. Consequently, extrapolation of research about reasons for surrender from other countries may not provide an accurate foundation on which to base intervention strategies aimed at reducing cat surrender in Australia. Previous research internationally has shown that both human-related reasons (e.g., accommodation, personal, and financial reasons) and cat-related factors (e.g., unwanted kittens or cat health or behavior) contribute to the surrender of owned cats, although the relative frequency of these reasons differs between studies (Casey et al., 2009; DiGiacomo, Arnold, & Patronek, 1998; Patronek, Glickman, Beck, McCabe, & Ecker, 1996; Salman et al., 2000; Scarlett, Salman, New, & Kass, 1999; Shore, Petersen, & Douglas, 2003).

To the authors' knowledge, no published studies have explored reasons for people surrendering cats for whom they do not perceive ownership to shelters, even though these cats comprise the majority of cats admitted to most shelters in Australia and worldwide (Alberthsen et al., 2013; ASPCA, 2015; Casey et al., 2009; Marston & Bennett, 2009; Miller et al., 1996; New et al., 2000). Most stray cats in Australia are surrendered to animal shelters by the general public and are recorded as such because they are surrendered by a person who does not identify himself/herself as the caregiver or the caregiver's agent (Alberthsen et al., 2013).

Semiownership is a term used to describe the situation in which people provide care to cats for whom they do not perceive themselves to be the owner (Toukhsati, Bennett, & Coleman, 2007). This phenomenon has been widely reported, for example, in Australia (Toukhsati et al., 2007), Ireland (Downes, Canty, & More, 2009), Italy (Slater et al., 2008), and the United States (Haspel & Calhoon, 1990; Levy, Woods, Turick, & Etheridge, 2003). Semiowned cats are generally not neutered (Haspel & Calhoon, 1990; Toukhsati et al., 2007; Toukhsati, Phillips, Podberscek, & Coleman, 2012) and contribute considerably to the unwanted cat population (Alberthsen et al., 2013; Toukhsati et al., 2007) and to shelter intakes (Zito et al., 2016). Factors underlying semiowners' decisions to surrender rather than retain these cats and assume ownership have not been described.

Exploring the reasons for owned cat surrender (Casey et al., 2009; Patronek et al., 1996; Salman et al., 1998, 2000; Scarlett, New, Kass, & Salman, 2001; Scarlett et al., 1999) has resulted in recommendations for strategies to reduce this phenomenon. Similar benefits may be gained from obtaining equivalent information from surrenderers of unowned cats, particularly cat "semiowners." Human–cat bonds exist not only between cat guardians who perceive ownership and their cats, but also between cats and the people who care for them but do not perceive ownership, such as cat semiowners and cat colony caretakers (Centonze & Levy, 2002; Haspel and Calhoon, 1990; Toukhsati et al., 2007; Zasloff & Hart, 1998). An understanding of the reasons that human–cat bonds are weakened and cats are surrendered is important for the development of effective intervention strategies to reduce the number of cats surrendered (Scarlett, 2008; Sharkin & Ruff, 2011). The objectives of this study were threefold: to describe reasons for surrender of both unowned and owned cats to Australian animal shelters, to compare reasons for surrender between unowned and owned cats, and to describe the reasons people give for not wanting to keep/assume ownership of the cats they are surrendering. (Hereafter, these latter reasons are referred to as "barriers to assuming ownership.")

Materials and methods

Study design and data collection

A cross-sectional study was conducted among people surrendering cats to Australian RSPCA shelters in Sydney, Melbourne, and Brisbane, Australia, from February 1, 2012, to September 30, 2012.

The study was approved by the University of Queensland Ethics Committee (Project #2011001160). The same methodology and participants ($n = 141$) were used as previously described in detail elsewhere (Zito et al., 2016). In brief, people surrendering cats were asked by admission staff at that time if they would participate in the study, and if they consented, all cats surrendered on that day by the participant were enrolled.

Surrenderers were only eligible for enrollment once, and if they had already participated, additional cats surrendered by them at later dates were not enrolled. Data were collected from consenting participants using a standardized questionnaire administered 1 to 8 weeks after the day they were asked to participate; the questionnaire was administered by telephone interview ($n = 128$ participants) or through a website ($n = 13$). To allow time for participants to recover from the potentially distressing experience of surrendering a cat and feel comfortable talking to an interviewer, participants were not contacted in the 1st week after the surrender. Eight weeks was allowed for the completion of interviews, as time was needed for the shelter staff to give the details of the participants to the research team and for participants to be contacted. If a participant could not be contacted and complete the questionnaire within 8 weeks of the surrender, they were excluded from the study to minimize the possibility of data errors due to surrenderers forgetting details of their interactions with the surrendered cats.

Both forced-choice and open-ended questions were used to obtain cat-level data (for answers, including reasons for surrender of the specific cat, see Table 1), which were collected for each cat being surrendered, along with surrenderer-level data (e.g., respondent demographics; Zito et al., 2016). The questionnaire was developed based on relevant literature and consultation with academic and industry experts. The reasons for surrender used in the questionnaire were developed with reference to those used in other published work (Alberthsen, 2014; Casey et al., 2009; Patronek et al., 1996; Salman et al., 1998, 2000; Scarlett et al., 1999, 2001) and the electronic database used by the participating shelters and others worldwide (Sheltermate/Shelter Buddy). Ten reasons for surrender of both owned and unowned

Table 1. Reasons for owners and nonowners taking the cat to the shelter and for nonowners not keeping the cat.

Question and variable details
<i>To what extent did the following reasons contribute to you taking the cat to the shelter?^a</i>
<i>All owned and unowned cats:</i>
<ul style="list-style-type: none"> • A litter of unwanted kittens • The cat's behavior was unacceptable (e.g., the cat was unfriendly, aggressive, house soiling, noisy) • The cat was unwell or injured • Reasons relating to your accommodation • Keeping the cat was too expensive • You were concerned about the risks the cat posed to a baby or child in the family • Allergies to the cat • Reasons (other than allergies) relating to your or your family's health • Other personal reasons • Other (the surrenderer was asked to give details of the "other" reason)
<i>Unowned cats only:</i>
<ul style="list-style-type: none"> • It was not your cat • You were concerned for the cat • You thought the cat would be better off in a shelter • You did not want the cat around your property
<i>Which of the following reasons contributed to you not keeping the cat and to what extent?^a</i>
<i>For unowned cats only:</i>
<ul style="list-style-type: none"> • You already have companion animals and cannot have another • You do not want a cat • You could not have a cat in your current accommodations • You think that having a cat is too expensive • You do not like cats • You did not like this particular cat • You think it is too much responsibility to have a cat • Other (the surrenderer was asked to give details of the "other" reason)

^a Answered on a Likert scale of 1 to 5, where 1 = "a lot" and 5 = "not at all."

cats were developed in this way. Reasons for surrender of unowned cats have not previously been described, as the surrender reason for these cats has traditionally been recorded as stray. Therefore, four additional surrender reasons specific to unowned cats were identified and developed for use in this study.

We conducted a pilot test by administering an early draft of the questionnaire to 10 test respondents (not enrolled participants). These people were invited to make comments on the structure and content of individual questions, which we reviewed when we developed the final draft. We also did a quick test of the reliability of the questionnaire by administering it to the same 10 people on two separate occasions, separated by approximately 1 week. We did not conduct a formal reliability analysis due to the low numbers but manually went through the data to look for areas of inconsistency. These data were also reviewed during development of the final instrument to provide face and content validity. The questionnaire is available from the first author upon request.

All responses were entered directly into a digitized questionnaire (Qualtrics, 2012). Data from the two data collection methods were pooled for analyses, as there were no major differences between these subgroups in distributions of surrender reasons.

Cats were divided into two groups based on the surrenderers' perceived ownership of the surrendered cat. They were divided based on level of agreement on a 5-point Likert scale with the statement, "I consider myself to be the owner of the cat." As responses to this question were bimodal and highly polarized, the Likert scale was converted to a dichotomous outcome; surrenderers who strongly or somewhat agreed with the statement were categorized as perceiving they owned the cat. Surrenderers who neither agreed nor disagreed or who somewhat or strongly disagreed with the ownership statement were categorized as perceiving they did not own the cat (and the surrendered cat was categorized as "unowned").

Each surrenderer was asked to rate how much each of a series of possible reasons for surrender contributed to their decision to surrender the cat(s) who they surrendered on the day they were asked to participate (on a Likert scale of 1–5, where 1 = "a lot" and 5 = "not at all"), referred to as "importance to surrender decision." Surrenderers of owned cats were offered 10 possible surrender reasons to rate (9 specific reasons and 1 "other"), while surrenderers of unowned cats were offered 14 possible reasons to rate (13 specific reasons and 1 "other"; Table 1). For the "other" reason, participants were asked to rate the importance of any other reason to their surrender decision and were given the option to explain their other reasons in a free-text field. Results for each possible reason are reported only for those surrenderers who rated the specific reason.

For simplicity of reporting, reasons with an importance to the surrender decision of "a lot" or "quite a lot" are referred to here as strong reasons, and those reasons with an importance to the surrender decision of "somewhat" or "a little" are referred to here as weak reasons. Those surrenderers who did not nominate other reasons or who answered "not at all" to "other" were considered not to have additional reasons for surrender of the cat.

Motivations for not wanting to keep (and assume ownership of) unowned cats being surrendered were considered to be potentially different than the reasons for surrendering the specific cat, as they are barriers to assuming ownership rather than reasons for surrender. Therefore, each surrenderer of an unowned cat was also asked to rate (on a 5-point Likert scale) how much each of a series of possible reasons contributed to their decision not to keep the cat (Table 1). The surrenderer was also given an "other" option, as they were for surrender reasons.

Statistical analyses

Statistical analyses were performed using Stata (Version 12.1, StataCorp, College Station, TX). Among owned cats, distributions of responses were compared between reasons with pairwise Wilcoxon's matched-pairs signed-rank tests, using the Stata `-signrank-` command. The *p* values were adjusted for

multiple pairwise comparisons using the Benjamini-Hochberg Step-Up False Discovery Rate method, with the Etcetera module in WinPepi (Version 11.11; Abramson, 2011). The same methods were used separately for unowned cats.

Distributions of responses for each potential surrender reason were compared between owned and unowned cats using proportional odds models, with the `-ologit-` command in Stata. Robust standard errors that accounted for clustering cat with surrenderer were used. The exponentiated coefficients from these models estimated the effect of being owned (relative to unowned) on the odds of cats having a particular degree of contribution (i.e., a little, somewhat, quite a lot, or a lot) or higher compared to the odds of a lower degree of contribution. They were based on the assumption that the ratio of these odds would be the same if each degree of contribution was used as a cut point (the proportional odds assumption). For each potential reason, this assumption was checked by comparing the log likelihoods of the proportional odds model and the corresponding multinomial logit model, using the likelihood ratio test without accounting for clustering cat with surrenderer.

For the possible surrender reason of the cat's behavior, there was evidence of nonproportional odds as indicated by a low p value from the likelihood ratio test, so results from the multinomial logistic model (rather than from the proportional odds model) with robust standard errors that accounted for clustering cat with surrenderer were used. For two variables (cat allergies and concern about the risk the cat posed to a baby or child), most surrenderers selected "not at all," resulting in sparse or zero counts for some answer combinations, and so distributions of binary variables (with each cat falling into either a lot/quite a lot or somewhat/a little/not at all) were compared between surrenderers of owned and unowned cats using exact logistic regression. Conditional probability tests were used; p values were calculated using the mid- p rule as recommended by Agresti (2007). Where surrenderers did not provide a response for a particular surrender reason, the cats were excluded from analyses of that possible reason because it was not possible to know what response category they fell into.

Correlations in responses to different possible surrender reasons among cats were assessed using Spearman's correlation coefficients, with Stata's `-spearman-` command. The p values were also calculated for each of the correlation coefficients. For each pair of possible reasons, all cats (owned and unowned) for whom the surrenderer selected a response for both possible surrender reasons were included. Correlations were considered important if they had a correlation coefficient of .4 or greater (either positive or negative) and a p value $< .05$.

The number of strong reasons that each surrenderer identified as having contributed to the surrender was calculated for all cats. Mean numbers of strong reasons were then compared between owned and unowned cats using linear regression, with surrenderer fitted as a random effect using Stata's `-xtreg-` command. For unowned cats, surrenderers were offered four more possible reasons ("not my cat," "concerned for cat," "thought cat would be better off in shelter," and "did not want cat around"), so the comparison of the numbers of strong reasons was repeated and accounted for by converting the number of reasons for each respondent to a proportion of the total number of possible reasons offered (10 for owned cats and 14 for unowned cats). The distributions of these proportions were then compared between surrenderers of owned cats and those of unowned cats using the Mann-Whitney U test.

All cats were retained in the descriptions and analyses rather than just one cat surrendered by each respondent, as answers to cat-level questions were specific to each individual cat. Some of the statistical procedures used in analysis (Wilcoxon's matched-pairs signed-rank tests, exact logistic regression models, Spearman's correlation coefficients, and the Mann-Whitney U test) did not account for clustering cat with surrenderer. Accordingly, p values from these analyses may be smaller than if all cats had been statistically independent of each other. However, these procedures were used because they were otherwise the most appropriate approaches and because the effects of disregarding this clustering on our calculated p values were probably small, as the mean number of cats per surrenderer was close to 1 (1.29 when all cats and surrenderers were considered).

Results

Demographics of surrenders and cats

During the 8-month study period, 2,752 eligible cats were surrendered to the participating animal shelters. It was not possible for us to determine from the shelter's records the number of eligible people who surrendered during the study period. In total, 197 people surrendering these cats were approached and consented to participate in the study. Not all people were invited to participate by shelter staff. Reasons given by shelter staff for not approaching potentially eligible people surrendering cats were that they did not feel comfortable doing so when the surrenderer was upset or aggressive, they forgot, or they were too busy. In addition, some staff were not trained or briefed about the research and so approached no one.

No follow-up was possible for 56 enrolled participants (28%) because they could not be contacted (due to incorrect or illegible phone numbers [$n = 48$] or failure to sign the consent form/provide contact details [$n = 3$]) or were unwilling to participate ($n = 5$). We were unable to replace losses to follow-up with additional participants because the animal shelters were unable to continue approaching people for consent; our study imposed extra work on the shelter workers, which became untenable during the busiest time of year (summer; October–February). Additional details regarding the study response rate and results have been presented elsewhere (Zito et al., 2016).

In total, 140 surrenderers were enrolled in the study. (One participant was excluded, as the majority of the cat-level data for the cat they surrendered were missing.) The enrolled participants surrendered a total of 177 cats on the days they were asked to participate: 116 respondents surrendered 1 cat, 14 surrendered 2 cats, 9 surrendered 3 cats, and 1 respondent surrendered 6 cats. For 55 of these cats, the surrenderer considered himself or herself to be the owner; for the remaining 122 cats, the surrenderer considered himself or herself to not be the owner. Of the 24 respondents who surrendered multiple cats, all but 1 surrendered only owned or only unowned cats; 1 respondent surrendered both an owned cat and an unowned cat.

Most respondents (66%; 91 of the 138 respondents who recorded their sex) were female and aged 36 to 55 years old (93%; 114/122), and the majority (62%; 86/139) were employed. Of those 55 cats whose surrenderers identified themselves as the owner, 5% (3/55) had been owned by the surrenderer for less than a month, 56% (31/55) had been owned by the surrenderer for 1 month to < 12 months, and 38% (21/55) had been owned by the surrenderer for > 12 months. Of those 122 cats whose surrenderers identified themselves as nonowners, 3 cats did not have their association time with their surrenderer recorded. Of the remaining 119 cats, 61% (73/119) had been associated with their surrenderer for less than a month, 34% (41/119) had been associated with their surrenderer for 1 month to < 12 months, and 4% (5/119) had been associated with their surrenderer for > 12 months. The sex of the surrendered cat was known for 78% of owned cats (43/55) and 26% of unowned cats (32/122). Of these, the majority of both owned cats (26/43) and unowned cats (17/32) were male.

The majority of surrenderers of both owned (44/55) and unowned cats (100/122) considered the cats they surrendered to be adult cats. Of those cats whose surrenderers indicated the cat's specific age group (49 owned cats and 82 unowned cats; with age group categories of younger than 6 months old, 6–11 months old, 1–7 years old, and older than 7 years old), most owned cats were identified as being aged 1 year to 7 years old (43%; 21/49), and most unowned cats were aged 6 to 11 months old (38%; 31/82).

Reasons for surrender

Owned cats

For 53 of the 55 owned cats, the number of strong reasons that contributed to their owners' decisions to surrender them were able to be calculated (2 cats had missing data for these questions). For 49% (26/53) of these owned cats, multiple strong reasons contributed to their owners' decisions to surrender: 38% (20/53) had just one strong reason (Figure 1), and for 7 cats, the owners only offered reasons

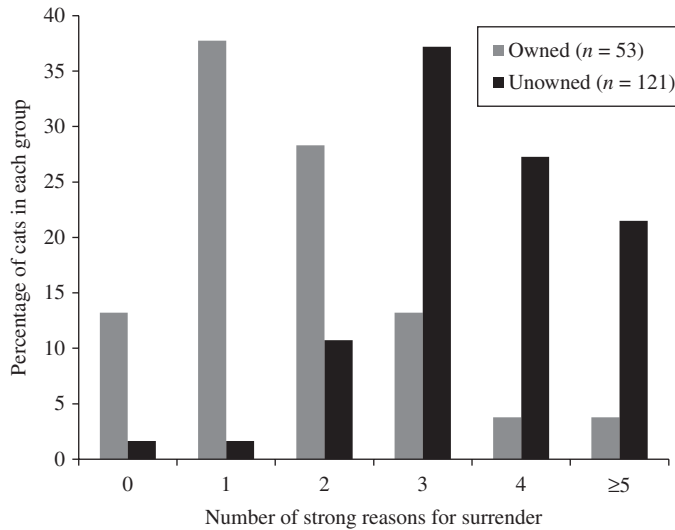


Figure 1. Number of strong reasons for surrender of owned and unowned cats, out of a potential 10 reasons for owned cats and 14 reasons for unowned cats.

that contributed weakly to their decision. The most commonly reported strong reasons were accommodation-related (47%; 24/51), personal (such as relationship breakdown, job loss, tragedy, 28%; 14/50), and financial (24%; 11/50; Table 2). Of the 24 cats whose owners cited accommodation-related reasons as a strong reason contributing to the surrender, a specific reason was recorded for 19 cats. Reasons that were consistent with an inability to find suitable accommodation predominated and were reported by 79% of surrenderers (15/19). For example, cats were not allowed, the accommodation available was too small for the number of cats, or the accommodation available was shared with other people who did not want the cats.

Table 2. Reasons for surrender of owned cats.

Surrender reason ^{a,b}	Contribution of reason for decision to surrender owned cats: % (n)			Pairwise comparisons of surrender reason distributions ^c
	A lot/quite a lot	Somewhat/a little	Not at all	
Accommodation-related reasons (n = 51)	47 (24)	10 (5)	43 (22)	
Other personal reasons ^d (n = 50)	28 (14)	22 (11)	50 (25)	b, e, g
Financial reasons (n = 51)	24 (12)	6 (3)	71 (36)	c, d, e
Unwanted kittens (n = 16)	19 (3)	6 (1)	75 (12)	a, b, c
Cat allergies (n = 50)	18 (9)	0	82 (41)	a, d, g
Other reasons (n = 55)	18 (10)	2 (1)	80 (44)	b, e, f, g, h
Cat's behavior (n = 51)	16 (8)	10 (5)	75 (38)	a, c, f
Cat's health (n = 50)	8 (4)	0	92 (46)	a, f
Concern about the risk cat posed to a baby or child (n = 50)	8 (4)	2 (1)	90 (45)	a, d
Human health reasons ^e (n = 49)	6 (3)	6 (11)	88 (43)	a, d, h

^a Percentages do not always sum to 100% due to rounding.

^b Numbers are less than 55 when some surrenderers did not select a response for the cat.

^c The distribution for each surrender reason without a common letter differed significantly (*p* value adjusted for multiple pairwise comparisons < .05) from the distribution for each other surrender reason. For example, the distribution of accommodation-related reasons differed significantly from all other surrender reasons except other personal reasons, unwanted kittens, and other reasons (all of which have "b" in common). These pairwise comparisons do not indicate the magnitudes of differences between the variable distributions, just whether they were significantly different.

^d Other personal reasons included reasons such as relationship breakdown, job loss, personal tragedy, etc.

^e Other than allergies.

Cat behavior strongly contributed to the surrender decision for 16% (8/51) of owned cats and most commonly included aggression and house soiling (which contributed to owned cat surrender for three and four cats, respectively). It was uncommon for cat allergies, cat health, concern about the risk the cat posed to a baby or child, and human health reasons to contribute to the decision to surrender an owned cat.

For 10 owned cats, “other reasons” strongly contributed to the decision to surrender (18%; 10/55), and for most of these (7/10), the surrenderer gave reasons that indicated they did not feel they could care for the cat appropriately (lack of time to provide care, lack of appropriate facilities for a cat, inability to provide adequate care for the number of cats).

Of the 55 owned cats, 11 were considered by their owners to be kittens. A litter of unwanted kittens strongly contributed to the decision to surrender 2 of these kittens, but it did not for the remaining 9 kittens. The strong reasons given for surrender for these kittens were the expense of keeping the kitten (6/11), personal reasons (4/11), accommodation-related reasons (3/11), the kitten’s behavior (3/11), risk to a child or baby (2/11), allergies (2/11), and respondent health (1/11).

Unowned cats

For 121 of the 122 unowned cats, the number of strong reasons that contributed to respondents’ decisions to surrender the cats were able to be calculated. (One cat’s surrenderer cited only reasons that contributed weakly to their decision to surrender.) Nearly all surrenderers of the remaining unowned cats (96%; 117/121) cited multiple strong reasons for their decision to surrender (Figure 1). The mean number of strong reasons per cat (3.4) was significantly higher than the mean for owned cats (1.6), as were the proportions of the total number of possible reasons offered (14 possible reasons for unowned cats and 10 for owned cats; Figure 2; $p < .01$ for both analyses).

For unowned cats, the most common strong surrender reasons were “not my cat” (85%; 99/117), concern for the cat (72%; 83/116), and the surrenderer’s belief that the cat would be better off in the shelter (59%; 68/116 cats), while financial reasons, accommodation-related reasons, concern about the risk the cat posed to a baby or child, and the cat’s health did not commonly contribute to the decision (Table 3).

A litter of unwanted kittens contributed to the decision to surrender 29% (30/104) of unowned cats. Of the 22 unowned cats that the surrenderers considered kittens, a litter of unwanted kittens strongly

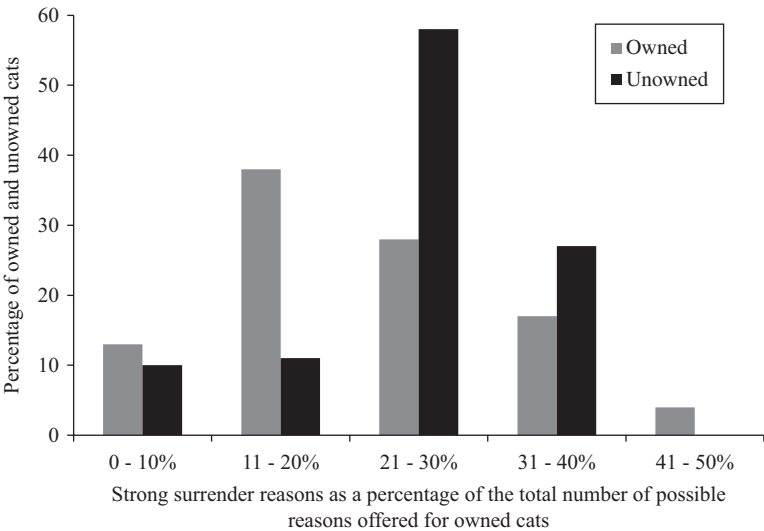


Figure 2. Percentage of owned ($n = 53$) and unowned ($n = 121$) cats for whom strong reasons for surrender were given, as a percentage of the total number of possible reasons offered.

Table 3. Reasons for surrender of unowned cats.

Surrender reason ^a	Contribution of reason to decision to surrender unowned cats: % (n)			Pairwise comparisons of surrender reason distributions ^b
	A lot/quite a lot	Somewhat/a little	Not at all	
Not my cat ^c (n = 117)	85 (99)	9 (11)	6 (7)	a
Concerned for cat ^c (n = 116)	72 (83)	18 (21)	10 (12)	a
Thought cat would be better off in shelter ^c (n = 116)	59 (68)	23 (27)	18 (21)	
Did not want cat around ^c (n = 116)	45 (52)	9 (10)	47 (54)	b
Unwanted kittens ^d (n = 104)	29 (30)	7 (7)	64 (67)	c, d
Other reasons (n = 122)	26 (32)	2 (3)	71 (87)	b, d
Cat's behavior (n = 116)	26 (30)	6 (6)	69 (80)	c
Financial reasons (n = 74)	16 (12)	14 (10)	70 (52)	c, e
Accommodation-related reasons (n = 75)	13 (10)	6 (4)	81 (61)	e, f
Cat's health (n = 89)	12 (11)	1 (1)	87 (77)	e, f
Other personal reasons ^d (n = 74)	4 (3)	5 (4)	91 (67)	f, h
Cat allergies (n = 74)	1 (1)	3 (2)	96 (71)	g, h
Human health reasons ^e (n = 74)	1 (1)	3 (2)	96 (71)	g
Concern about the risk cat posed to a baby or child (n = 74)	0	3 (2)	97 (72)	g

^a Numbers are less than 122 when some surrenderers did not select a response; percentages may not always sum to 100% due to rounding.

^b The distribution for each surrender reason without a common letter differed significantly (p value adjusted for multiple pairwise comparisons $< .05$) from the distribution for each other surrender reason except for surrender reasons with common letters. For example, the distribution of "not my cat" differed significantly from the distributions for the other surrender reasons except "concerned for cat," which has "a" in common with "not my cat." These pairwise comparisons are not an indication of the magnitudes of differences between the variable distributions, just whether they were significantly different.

^c These options were only given to surrenderers who were surrendering cats they considered unowned.

^d Other personal reasons included relationship breakdown, job loss, personal tragedy, etc.

^e Other than allergies.

contributed to the decision to surrender 13 of these kittens but not the remaining 9 kittens. The strong reasons for surrender given for these kittens were concern for the kitten (14/22), the kitten did not belong to them (13/22), the kitten was unwell (11/22), the kitten would be better off in the shelter (8/22), they did not want the kitten around their property (6/22), the kitten's behavior (5/22), or the expense of keeping the kitten (5/22).

Unacceptable cat behavior contributed to the decision to surrender 26% (30/116) of unowned cats. For the 30 unowned cats for which cat behavior contributed strongly to the decision to surrender, the predominant behavioral reasons were aggression to other animals (12/30) and soiling in the house or garden (11/30). For slightly more than a quarter (32/122) of unowned cats, the surrenderer volunteered "other reasons" as strong contributors to their decision to surrender, with reasons relating to other companion animals (9/32) and concerns about wildlife (9/32) predominating.

Comparisons of owners' and nonowners' reasons for surrender

Accommodation-related reasons contributed more strongly to the decision to surrender for owned cats than for unowned cats (OR = 5.6; 95% CI [2.3, 13.7]; $p < .01$). Personal reasons also contributed more strongly to the decision to surrender owned cats than to the decision to surrender unowned cats (OR = 9.9; 95% CI [3.5, 28.1]; $p < .01$), as did allergies (OR = 15.7; 95% CI [2.5, 358.5]; $p < .01$) and perceived risk to a child or baby (OR = 8.3; 95% CI [1.4, infinity]; $p = .01$). The contributions of other reasons for surrender did not differ significantly between owned and unowned cats.

Correlations between surrender reasons

Negative correlations were found between three pairs of variables: surrenderer's concern for the cat and not wanting the cat on their property (r [correlation coefficient] = $-.45$; Table 4); surrenderer

Table 4. Correlations between possible reasons for surrender.

	Not my cat ^a	Did not want cat around	Concerned for cat	Thought cat would be better off in shelter	Unwanted kittens	Cat's behavior	Cat's health	Accommodation-related reasons	Financial reasons	Concern about the risk cat posed to a baby or child	Cat allergies	Human health reasons ^c
Did not want cat around ^a	.39 (< .01) ^b											
Concerned for cat ^a	-.05 (.56)	-.45 (< .01) ^d										
Thought cat would be better off in shelter ^a	-.09 (.31)	-.30 (< .01)	.66 (< .01)									
Unwanted kittens	-.38 (< .01)	-.16 (.11)	.04 (.69)	-.15 (.14)								
The cat's behavior	.26 (< .01)	.60 (< .01)	-.56 (< .01)	-.44 (< .01)	-.21 (.02)							
The cat's health	-.18 (.10)	-.14 (.20)	.24 (.03)	.32 (< .01)	-.02 (.85)	-.08 (.33)						
Accommodation-related reasons	-.06 (.63)	-.21 (.08)	.23 (.05)	.29 (< .01)	-.34 (< .01)	-.08 (.37)	-.15 (.10)					
Financial reasons	.10 (.39)	-.16 (.18)	.05 (.68)	-.10 (.42)	.35 (< .01)	-.20 (.02)	-.08 (.39)	-.19 (.004)				
Concern about the risk cat posed to a baby or child	.00 (1.0)	.18 (.12)	.00 (1.00)	.06 (.61)	-.01 (.91)	.17 (.07)	.03 (.75)	.05 (.61)	.09 (.30)			
Cat allergies	.00 (1.0)	-.07 (.54)	.18 (.12)	.22 (.06)	.00 (.98)	-.17 (.06)	.06 (.49)	-.15 (.11)	.11 (.23)	.14 (.12)		
Human health reasons ^c	.00 (1.0)	.08 (.51)	.18 (.12)	.22 (.06)	-.17 (.14)	.01 (.89)	.10 (.26)	-.03 (.75)	.02 (.9)	.18 (.04)	.41 (< .01)	
Other personal reasons	.12 (0.32)	.07 (.57)	.07 (.57)	.15 (.15)	-.27 (.02)	-.03 (.71)	-.03 (.77)	.37 (< .01)	.11 (.22)	.28 (< .01)	.41 (< .01)	.26 (< .01)

Note. All cats where the surrenderer selected a response for both surrender reasons were included. Numbers of cats used in pairwise correlations varied from 73 to 138.
^a These options were only given to surrenderers who were surrendering cats they considered unowned.
^b Correlation coefficient (p value for testing the null hypothesis that the correlation coefficient is 0).
^c Other than allergies.
^d Bolded correlation coefficients are those considered important: a correlation coefficient of .4 or greater (either positive or negative) and a p value of < .05.

thinking that the cat would be better off in the shelter and the cat's behavior ($-.44$); and surrenderer's concern for the cat and the cat's behaviors ($-.56$). Positive correlations were found for four pairs of variables: the surrenderer not wanting the cat on their property and the cat's behavior (r [correlation coefficient] = $.60$); the surrenderer thinking that the cat would be better off in the shelter and concern for the cat ($.66$); cat allergies and human health ($.41$); and cat allergies and personal reasons ($.41$).

Barriers to assuming ownership of unowned cats (reasons for not wanting to keep unowned cats)

For 117 of the 122 unowned cats, the surrenderer responded to the question asking whether they considered keeping the cat. Of these, 13% had given keeping the cat a lot of consideration (15/117), 4% (5/117) gave it quite a lot of consideration, 7% (8/117) somewhat considered it, 24% (28/117) considered it a little, and 52% (61/117) did not consider it. It was common for multiple reasons to contribute a lot or quite a lot to the decision not to keep the cat (41%; 51/122). Of the 111 surrenderers who gave additional details about the reasons that contributed to their decision not to keep the unowned cat, the most common reason was already having companion animals and not being able to have another (48%; 53/111; Table 5). The surrenderers of 78 unowned cats reported a reason other than the choices provided that contributed a lot or quite a lot to the decision not to keep the cat and gave details. The most commonly described "other reasons" were the cat's behavior (lack of sociability, aggression to other cats or people; 19%; 15/78), family issues (13%; 10/78), and concerns about wildlife (12%; 9/78).

Discussion

This study highlighted important differences between people who perceived themselves as owners and those who perceived themselves as nonowners of surrendered cats. The most common reasons for surrender given by people who perceived themselves as cat owners were human-related—accommodation-related, personal, and financial reasons—results that are consistent with findings from other research into reasons for surrender of owned cats (Marston & Bennett, 2009; Miller et al., 1996; Salman et al., 1998; Shore et al., 2003). Accommodation and personal reasons contributed significantly more to the surrender decision of owned cats compared with unowned cats. The observation that for almost half of the owned cats, accommodation contributed strongly suggests that directing resources toward improving the availability of companion animal-friendly accommodations and providing adoption counseling that incorporates advice on companion animal-friendly accommodations would be worthwhile in reducing the numbers of owned cats surrendered (Shore et al., 2003).

Financial reasons also commonly contributed to owners' decisions to surrender their cats. It is possible that some of these owners may benefit from financial aid to care for their cats. Some animal welfare organizations provide food banks (Bi-State Pet Food Pantry, 2014; Sacramento Pet Food Bank, 2011) and low-cost health care (The Humane Society of the United States, 2014; Lort Smith, 2014) to

Table 5. Reasons that contributed to the decision to not keep/adopt unowned cats ($n = 111$).

Reason	Contribution of reason		
	A lot/quite a lot % (n)	Somewhat/a little % (n)	Not at all % (n)
Already have companion animals and could not have another	48 (53)	7 (8)	45 (50)
Did not want a cat	10 (11)	14 (16)	76 (84)
Could not have a cat in current accommodations	8 (9)	4 (4)	88 (98)
Think having a cat is expensive	7 (8)	6 (7)	87 (96)
Do not like cats	5 (5)	8 (9)	87 (97)
Did not like this particular cat	5 (5)	5 (5)	91 (101) ^a
Think that it is too much responsibility to have a cat	5 (5)	4 (4)	92 (102)

^a Percentages do not always sum to 100% due to rounding.

try to address financial issues leading to surrender, but access to these programs is very limited geographically.

In contrast, for unowned cats, the surrenderer most commonly gave reasons that were related to concern for the cat and his or her welfare, with the majority believing the cat would be better cared for by the shelter. There was also a positive correlation between the surrenderer thinking that the cat would be better off in the shelter and concern for the cat. These findings suggest that the surrenderers of unowned cats in this study commonly acted because they cared for the cats, as has been reported for nonowners who feed/care for cats and who continue to feed/care for the cats and do not surrender them (Zasloff & Hart, 1998). It seems that nonowners surrendering cats also believed surrender would result in a good outcome for the cats. In reality, the outcome for stray cats is more often euthanasia than rehoming (Alberthsen et al., 2013). Anecdotal evidence suggests that when a shelter informs an owner surrendering their cat that the cat will be euthanized, it does not change the owner's mind and they nevertheless still surrender the cat (Scarlett, 2008). It has been suggested that the reason may be because the owner has struggled with the decision for an extended period before the surrender (DiGiacomo et al., 1998), but it is unknown if this reason is also true for nonowners. Such an approach, however, may result in a poor outcome for the cat; it carries a risk that the surrenderer will take the cat somewhere else or abandon him or her.

In this study, most surrenderers of unowned cats and nearly half of the surrenderers of owned cats gave multiple strong reasons for their decision to surrender. This finding is consistent with research investigating the surrender of owned cats (DiGiacomo et al., 1998; Scarlett et al., 1999; Shore et al., 2003) and dogs (New et al., 1999), and it highlights the complexity and multifactorial nature of the decision-making process that precedes surrender as well as the intractable nature of the problem. The number of reasons involved in the decision to surrender differed significantly between people who perceived themselves as nonowners and those who perceived themselves as owners, with slightly more than half of owners offering only one reason. DiGiacomo et al. (1998) studied the reasons for surrender of owned cats and concluded that if only one reason was given, that reason may not be the primary reason for relinquishment. The authors of a recent systematic review and meta-analysis of reasons for surrender of dogs to shelters recommended that owners should be given the option to provide multiple reasons for surrender, that the number of reasons given should be reported by the shelter, and that data be collected by shelters using standardized and systematic methods (Lambert, Coe, Niel, Dewey, & Sargeant, 2015).

The complex nature of surrender decisions and the multiple contributing reasons demonstrated in our study suggest that it would be beneficial if shelters implemented admission procedures that facilitate the recording of multiple surrender reasons for cats, such as incorporating a presurrender interview. Surrender interviews would also help shelter staff to determine if assistance can be provided to owners, which might help the owner avoid the surrender and allow them to retain their cat. Assistance could be provided for a number of common concerns that lead to surrender, such as providing affordable food and health care for the cat and providing help with behavioral problems or family–pet conflicts (e.g., concerns about the introduction of the cat to a new baby). This strategy may be cost-effective for the shelter, as it avoids the costs of admitting, caring for, and rehoming surrendered cats. However, this strategy would only be effective if the shelter understood the reasons for the surrender and if they are reasons that can be resolved with a shelter's assistance.

The addition of surrender interviews to the admission procedure for unowned cats would be also beneficial, as it allows a shelter to ask if the surrenderer may be able to offer assistance, such as fostering the cat until more space is available at the shelter or until kittens are weaned. If the surrenderer is in a position to help, it may help avoid overcrowding at the shelter and euthanasia of healthy but unweaned kittens, which are often not accepted by shelters. Surrender interviews need not be rigidly implemented; flexibility may be necessary to protect a cat's welfare in situations where surrender is urgent and an interview is not possible. Some shelters have already introduced surrender interviews to try to prevent surrender, with some apparent success, and they are offered with assistance (Animal Welfare League of Queensland, 2011; Jacksonville Humane Society, 2014; RSPCA Queensland, 2014).

For example, live release rates (percentages of surrendered cats who leave the shelter alive through adoptions, outgoing transfers, or returning to their owners/guardians) for cats in Queensland RSPCA shelters increased from 56% to 81% since surrender interviews with assistance were introduced (executive manager, RSPCA Queensland, personal communication, October 2014). In this case, the specific contribution of surrender interviews to this improvement is not known, as other changes in policy were implemented during the same time period, including a change in policy to increase the rehoming rate of cats who have had “cat flu”; changes in the way a cat’s behavior is assessed and addressed; improvement of shelter medical protocols; and the use of managed admission, intershelter transfers, off-site adoption locations, and other methods to maximize utilization of available capacity for care. In addition, some organizations (such as RSPCA Queensland and Animal Welfare League of Queensland) have implemented other initiatives to reduce surrender and abandonment through community education/outreach programs and provision of affordable veterinary care (executive manager, RSPCA Queensland, personal communication, October 2014; Animal Welfare League of Queensland, 2011).

Our finding that for both owned and unowned cats, the most common cat behaviors contributing to surrender were aggression and soiling is consistent with other reports about owner-surrendered cats (Casey et al., 2009; Salman et al., 1998). However, the cat’s behavior was given as a reason for surrender for only 8% of owned cats compared with 26% of unowned cats. In previous reports, behavioral reasons contributed to the surrender of widely varying percentages of owned cats, including 8% (Luke, 1996), 16% (Casey et al., 2009), and 33% (Salman et al., 1998). The finding that owners predominantly gave human-related reasons for their decisions to surrender and were less likely to report behavior-related reasons than nonowners may be explained, in part, by the fact that compared with nonowners, owner surrenderers were less willing to divulge reasons (such as behavioral problems) that could jeopardize the chances of their cat finding another home, as has been previously suggested (Casey et al., 2009; DiGiacomo et al., 1998).

Animal shelters usually record only one reason for each cat’s surrender (RSPCA and Animal Welfare League of Queensland staff, personal communication, February 2011), with the surrender reason for unowned cats generally being recorded simply as “stray” (RSPCA staff, personal communication, October 2014). Findings from the current study indicate that these data are incomplete and are unlikely to capture the full complexity of the reasons for the surrender. Collecting more detailed data on surrender reasons, for example, through the use of surrender interviews, may be worthwhile for shelters; the information could be helpful for assessing the adoptability of the cat and allowing surmountable issues to be addressed before the cat is placed for adoption.

In addition, statistical analysis of detailed surrender data may reveal valuable trends and information to help guide future strategies to reduce cat surrenders. For example, if behavioral problems were found to be a common reason for cat surrender, the shelter might consider hosting cat behavior clinics for owners or may consider educational programs that reach out to nonowners and offer guidance for dealing with unwanted behaviors. In this way, some potential surrenderers of unowned cats may be more likely to adopt their stray cats.

Similarly, concerns about the effects of a cat on wildlife—which were expressed by owners and nonowners in this study and others (Grayson, Calver, & Styles, 2002; Toukhsati et al., 2012) — can be addressed by education programs that promote indoor cats and cat enclosures (Australian Government Department of the Environment, 2014; Calver, Thomas, Bradley, & McCutcheon, 2007; Toukhsati, Young, et al., 2012). Examples of such education programs are the “Cats Indoors” initiative from the American Bird Conservancy (2016), which encourages keeping cats confined to protect wildlife and cats, and the Indoor Pet Initiative, which offers information on how to provide good health and welfare for indoor cats (The Ohio State University, 2015). There are also alternative potential solutions available for people who are reluctant to confine their cats, such as collar-mounted predation deterrents, which can help to prevent and reduce predation by cats who are allowed access to the outdoors (Calver & Thomas, 2011; Calver, Thomas, Bradley, & McCutcheon, 2007; Gordon, Matthaei, & van Heezik, 2010; Hall, Fontaine, Bryant, & Calver, 2015; Nelson, Evans, & Bradbury, 2005; Ruxton, Thomas, & Wright, 2002; Willson, Okunola, & Novak, 2015).

Although it was uncommon for cat health, human health, or concern about the risk the cat posed to a baby or child to contribute to the surrender decision for either owners or nonowners, the latter reason contributed significantly more to the surrender in owned compared with unowned cats. Cat allergies also contributed significantly more to the surrender decision of owners than those of nonowners. Cat allergies and a new baby have been previously reported as reasons for owners to surrender their cats (Casey et al., 2009; Scarlett et al., 1999), and it is not surprising that these reasons are more common for owners compared with nonowners, as owners are more likely to be in closer contact with the cats for a longer period of time, which would allow time for allergies to develop and become problematic or for concerns associated with young children to surface.

Unwanted kittens have been previously identified as commonly contributing to surrender of owned cats (Casey et al., 2009; Miller et al., 1996). In our study, unwanted kittens contributed strongly to relinquishment in 19% and 29% of owned and unowned cats, respectively. This finding is almost certainly due to large numbers of unwanted kittens bred in the community, and programs that reduce numbers of unwanted kittens born would also be expected to reduce numbers of surrendered cats. If the surrenderer is surrendering kittens but has retained the mother cat, it is particularly important to ensure that the mother is sterilized.

Sterilization of the mother of the kittens could perhaps become a condition of bringing in the kittens. Alternatively, cat semiowners could be offered free or low-cost cat sterilization by the shelter or through welfare organization/local government programs. Internationally, similar approaches are already being applied—for example, the “Million Cat Challenge” initiative in the United States includes a “return to field” program where healthy unowned shelter cats are sterilized, vaccinated, and returned to their locations of origin as an alternative to euthanasia (UC Davis Koret Shelter Medicine Program & Maddie’s Shelter Medicine Program at the University of Florida, 2014).

In our study, 17% of the unowned cats had a surrenderer who seriously considered keeping the cat, indicating a substantial potential new adopter population among people surrendering stray cats. However, for nearly half of these cats, the predominant reason for not adopting the cat was that they already had companion animals and could not have another. The fact that these surrenderers had assessed the potential issues involved (such as their capacity for care and not taking on a cat who would not be compatible with their current companion animal) implies that they are responsible owners, thereby supporting another of our findings, that the surrenderers of unowned cats predominantly cared about the cats. Knowing that the majority of surrenderers of unowned cats care about the cats they surrender indicates that this cohort of people may be amenable to social marketing messages about the consequences of feeding nonsterilized animals and the desirability of sterilizing these animals.

As is common in studies of this nature (Rohlf, Bennett, Toukhsati, & Coleman, 2010; Toukhsati, Phillips, et al., 2007; Toukhsati et al., 2012), recruitment of surrenderers to complete our questionnaire was difficult. Surrenderers may be distressed or feel guilty at the time of surrender, which makes many reluctant to discuss the surrender. Due to the necessity for voluntary participation, this results in both a small sample size and uncertainty about the representativeness of the sample for the general population of surrendered cats. Consequently, although the findings presented in this study provide valuable preliminary data that can guide shelters and future research, similar studies with larger and more representative samples are needed to confirm our findings.

When determining reasons for cat surrender, misclassification bias may have occurred due to respondents’ perceptions of the social desirability of their reasons and actions. Cat caretakers and surrenderers may not be entirely honest about their actions or reasons for surrender due to a desire to present themselves in a more favorable light by giving what they believe to be more socially acceptable answers (Coe et al., 2014; DiGiacomo et al., 1998). The interview process, in which the participant did not meet the interviewer face to face and knew that their answers would not impact the outcome for the surrendered cat, may have helped minimize this bias in our study, but shelters collecting this kind of data at cat admission need to be aware of the potential for misclassification errors and should take steps to minimize them.

Conclusions

Respondents surrendering unowned cats to the animal shelters studied most commonly gave reasons that related to their concern for the cat and his or her welfare. Our results confirm previous findings that surrenderers of owned cats primarily cite human-related reasons for the surrender (personal, accommodation, and financial), perhaps pointing to a reluctance in owners to divulge cat-related surrender reasons that may jeopardize the chances of the cat finding a home. Multiple reasons contributing to the decision to surrender are common for both owners and nonowners, but surrenderers of unowned cats have more reasons for surrender than owners, highlighting the complexity and multifactorial nature of the decision process involved in surrender. A single surrender reason usually recorded at admission can be misleading or incorrect; additional surrender reason data collected at admission are warranted to gain a fuller understanding of this complex issue.

Presurrender interviews may facilitate the collection of these data and may enable the shelter to determine if assistance could be offered, which might avoid the surrender or delay it until the likelihood for a positive outcome (adoption rather than euthanasia) is greater. Unwanted kittens commonly contributed strongly to the reasons for surrender of both owned and unowned cats to animal shelters in Australia. Reducing the numbers of unwanted kittens bred in Australia represents a major potential point of intervention for reducing the numbers of cats surrendered to shelters.

It is common for surrenderers of unowned cats to seriously consider adopting the cat prior to surrender. Barriers to assuming ownership were largely related to the surrenderer's inability to responsibly care for the animal, reinforcing the finding that nonowners cared for the cats they surrendered.

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