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A survey of the management of inter-dog aggression by animal shelters in Canada

Jane S. Orihel, Rebecca A. Ledger and David Fraser
Animal Welfare Program, Faculty of Land and Food Systems, The University of British Columbia, Canada

Abstract

Identification and management of inter-dog aggression is important for animal rescue shelters to reduce the incidence of euthanasia and ensure the safe re-homing of animals. Forty-three shelters responded to a questionnaire which collected information about the management of dogs with inter-dog aggression in rescue shelters. Most shelters (33; 76.7%) admitted dogs reported by relinquishing owners as aggressive to other dogs. Most shelters reported inter-dog aggression as a common problem, affecting either 20–49 percent of dogs received (25 shelters; 58.1%) or 50 percent or more (7 shelters; 16.3%). Twenty-nine shelters reported that less than ten percent of adopted dogs are returned for inter-dog aggression, but some indicated much higher levels. Shelter employees generally reported that after admission, a dog’s level of aggression toward other dogs remains stable over time in the shelter. Management of aggressive dogs included humane destruction (37 shelters; 86%) and rehabilitation (20 shelters; 46.5%). Rehabilitation methods for inter-dog aggression included socialization, stress reduction, desensitization and distraction. Respondents expressed varied levels of confidence over the success of their programs. Rehabilitation techniques based on positive reinforcement were viewed as practical, affordable and effective for reducing inter-dog aggression, while less support was given for punishment-based methods. Factors preventing rehabilitation included financial constraints and lack of time, but shelters may be more likely to provide rehabilitation if a practical, scientifically validated program were available. Such a program could potentially increase both the welfare of aggressive dogs and the safety of the public.

Keywords: aggression, animal rescue shelters, dog, management, rehabilitation

Address for correspondence: Jane Orihel, Animal Welfare Program, Faculty of Land and Food Systems, The University of British Columbia, Vancouver, B.C., V6T 1Z4, Canada. E-mail: jorihel@interchange.ubc.ca.
Behavioral problems are a common reason why dogs are relinquished to rescue shelters (Patronek et al. 1996; DiGiacomo, Arluke and Patronek 1998). Of dogs surrendered to shelters, it has been reported that 30 percent of cases are due to behavior problems (Wells 1996). Moreover, many dogs adopted from shelters are returned because of misbehavior; one study found that of the dogs returned to a shelter, behavioral reasons were cited as the cause for return in 72 percent of cases (Ledger 1998). Two of the most common behavioral problems in returned dogs are aggression towards people (22%) and aggression towards other dogs (inter-dog or intraspecific aggression; 7%) (Ledger 1998).

Dog aggression poses a threat to the safety of people in the family and the community. For this reason, many countries prohibit the re-homing of dangerous dogs (e.g., UK’s Dangerous Dogs Act 1991, 1997). Consequently, many shelters have a legal as well as an ethical responsibility not to re-home aggressive dogs into the community. Where such policies exist, the aims are 1) to prevent harm to people and other animals by aggressive dogs, 2) to avoid prosecution for re-homing a dog that causes harm, 3) to safeguard the reputation of dogs in society, and 4) to reduce the number of dogs subsequently returned to shelters, thus reducing stress to the dog and owner and inefficient use of shelter resources (Ledger 2003).

As a result of these concerns, aggressive dogs are often kept long-term in the shelter, and/or ultimately euthanized (Hunthausen 1997; Tuber et al. 1999; Marston and Bennett 2003). Prolonged confinement reduces the welfare of the animal and is associated with stress in kennelled dogs (Beerda et al. 1999). Shelter facilities are often designed to provide physical containment and disease prevention rather than to promote the dog’s emotional well-being (Marston and Bennett 2003). Dogs are often housed individually in close proximity, a situation likely to cause or exacerbate existing aggression problems (Beerda et al. 1999). To reduce problems with liability and limited resources, many shelters have a policy to euthanize aggressive dogs. As a result, large numbers of animals are euthanized each year in rescue shelters.

Veterinarians and animal welfare agencies are showing increased interest in behavioral therapies to treat canine aggression (Voith 1991; Overall 1997; Tuber et al. 1999). Numerous recommendations for the treatment of inter-dog aggression in clinical practice have been published (Voith 1980; Hart and Hart 1985; Blackshaw 1991; Overall 1997) and treatment of this behavioral problem has been relatively successful (Mugford 1992; Sherman et al. 1996). Rehabilitation for behavioral problems is also gaining the attention of animal rescue organizations, perhaps partly because of the recent shift towards “no-kill” policies (Arluke 2003).
Although many shelters are committed to improving the welfare of relinquished and stray dogs, they are often ill-equipped to provide intervention for behavioral problems. Receiving a large number of unwanted pets each year, shelters are constrained by space and funds (Moulton, Wright and Rindy 1991; Marston and Bennett 2003) which must be directed primarily towards housing and health care. Additionally, the absence of structured rehabilitation programs for dogs in animal shelters is preventing widespread application, particularly for serious problems such as aggression.

Little information is available on how shelters are currently managing aggressive dogs, and whether rehabilitation is a feasible option. This paper describes a survey conducted to gain insight into the current management of aggressive dogs in animal shelters, and to explore how shelter staff perceive the challenges and feasibility of implementing rehabilitation for inter-dog aggression.

**Methods**

**Participants**

A questionnaire was distributed by post to 95 member organizations of the Canadian Federation of Humane Societies (CFHS) with kennel facilities for dogs. Seventy-six shelters with Internet services that had not responded within one month of receiving the questionnaire were re-contacted via email and encouraged to complete either the paper questionnaire or an electronic version. Thirty-three shelters replied by post and ten completed the electronic version, giving a total of 43 shelters (45%) which formed the basis of the dataset. These included shelters from all provinces of Canada, with the highest number of responses from British Columbia (15). A subset of eight shelters with rehabilitation programs for inter-dog aggression and 14 without rehabilitation were subsequently contacted by telephone for additional information and discussion. The questionnaire was completed by a staff member in a managerial position (32 cases), a shelter animal behaviorist (3), an animal care worker or technician (6), or a person of unknown position (2).

**Questionnaire**

The questionnaire consisted of 24 open and closed questions regarding two types of aggression problems: inter-dog aggression and general aggression (any form including aggression towards people). Information was collected on the shelter’s intake process for dogs with aggression, the incidence and perception of inter-dog aggression, and management practices for aggressive dogs. Participants also rated the suitability of various treatment techniques for inter-dog aggression.
Introductory questions asked respondents to report on: 1) the number of available dog kennels in the shelter, 2) the number of dogs typically received per year, and 3) the number of staff members employed by the shelter. The following information was collected about the intake process: 1) whether owners were required to indicate on the shelter intake form whether their dog is aggressive towards other dogs, 2) how often the shelter admits dogs reported by their owners as aggressive towards other dogs, and 3) whether the shelter conducts a behavioral assessment of dogs for aggression towards other dogs. Respondents also estimated 1) the number of newly admitted dogs that demonstrate inter-dog aggression upon intake, 2) the proportion of dogs returned to the shelter by new owners because of inter-dog aggression, and 3) the proportion of owners they believe are concerned about inter-dog aggression. Five scenarios (Table 3) were used to describe how a dog’s behavior towards conspecifics can change over time in the shelter. Participants rated each scenario on a 5-point Likert-type scale (1 = “never,” 2 = “rarely,” 3 = “sometimes,” 4 = “very often” and 5 = “always”) (Likert 1932).

A multiple response question was used to ask whether aggressive dogs are generally 1) put up for immediate adoption, 2) placed into foster homes, 3) rehabilitated within the shelter before adoption is allowed, or 4) humanely destroyed. An open-ended “other” category was included to allow participants to report management methods besides those listed.

Regarding the management of dogs with inter-dog aggression, respondents were asked whether these dogs were housed differently, were excluded from group exercise areas, or were subjected to special handling restrictions. Participants were asked whether the shelter performed obedience training or rehabilitation for inter-dog aggression, and, if so, how successful they judged the rehabilitation to be at reducing inter-dog aggression. Respondents who indicated that they did not presently rehabilitate dogs for inter-dog aggression were asked whether such a program would be feasible to implement in the shelter and what factors prevented them from implementing rehabilitation. In a follow-up telephone call to shelters without rehabilitation, a qualitative interview using open-ended questions determined whether participants would consider using a rehabilitation program if it was scientifically validated and designed specifically for use within animal shelters. Respondents were asked to comment on how implementing such a program may affect the number of dogs euthanized.

Finally, participants were given a list of various treatment approaches for reducing inter-dog aggression (Table 1). The techniques were based on
a number of commonly recommended treatments (Voith 1980; Hart and Hart 1985; Blackshaw 1991; Mugford 1992; Overall 1997), including positive reinforcement, desensitization, counter-conditioning, correction of aggressive behavior, and distraction. Two additional practises that may influence aggression where included: obedience training, which is often used as a preventative measure for canine aggression or in combination with treatment based on behavior modification (Blackshaw 1991; Reisner, Erb and Houpt 1994; Cameron 1997; Overall 1997), and increased exercise and/or play, which is sometimes included in shelter enrichment programs as it may affect the psychological well-being of dogs (Reid, Goldman and Zawistowski 2004). Participants were asked to rate the degree to which they believed the treatment would be effective (how successful it would be at reducing inter-dog aggression), practical (its ease of use, and the availability of qualified staff and space) and affordable (financially possible) within the shelter.

**Table 1.** Descriptions provided in the questionnaire of techniques used in the rehabilitation of inter-dog aggression.

<table>
<thead>
<tr>
<th>Technique</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obedience training</td>
<td>The dog responds to cues given by a trainer by performing basic behaviors (e.g., recall, sit and stay).</td>
</tr>
<tr>
<td>Positive reinforcement</td>
<td>Non-aggressive behavior is rewarded with something that the dog will work to gain at a given moment (e.g., food or attention).</td>
</tr>
<tr>
<td>Desensitization</td>
<td>The dog is repeatedly exposed to an unfamiliar dog at increasing proximity, as long as the dog being treated remains non-aggressive. Non-aggressive behavior is rewarded. The procedure is repeated with other unfamiliar dogs.</td>
</tr>
<tr>
<td>Counter-conditioning</td>
<td>The dog is taught a behavioral response other than the original aggressive response in the presence of another dog (e.g., sitting upon command).</td>
</tr>
<tr>
<td>Increased exercise and/or play</td>
<td>Increasing the frequency or duration that the dog is exercised or engaged in play.</td>
</tr>
<tr>
<td>Correction of aggressive behavior</td>
<td>Each time that an aggressive signal is produced by the dog in the presence of another dog (e.g., growling, staring or lunging), the trainer orients the head and/or body of the dog being treated away from the second dog.</td>
</tr>
<tr>
<td>Distraction</td>
<td>A distracting stimulus (e.g., rattle can or a spray of citronella) is used to interrupt an aggressive encounter when the dog being treated has initiated a threat signal towards another dog.</td>
</tr>
</tbody>
</table>
Data Analysis

Statistical analysis was performed using SPSS 11.0. To test whether shelters receiving more dogs per year experience a higher incidence of inter-dog aggression, Spearman rank-order correlation was used. Fisher’s exact test of proportions was used to determine whether shelters with rehabilitation for inter-dog aggression have a lower proportion of dogs returned for this behavior problem. A similar analysis tested whether shelters that assess dogs for inter-dog aggression are more likely to perform rehabilitation. The Kruskal-Wallis test for independent samples was used for ordinal and categorical variables with more than two possible values, and corrected multiple comparison tests were performed to identify significantly different pairs (Siegal and Castellan 1988). All tests were two-tailed with an alpha value of 0.05.

Results

Shelters had a range of 5–100 dog kennels (median = 16), received 40–3,700 dogs per year (median = 442) and had 1–60 salaried employees (median = 6).

Intake Process of Aggressive Dogs

Of the 43 shelters that responded, 42 (97.7%) reported that they require relinquishing owners to indicate on the intake form whether their dog tends to be aggressive toward other dogs. Thirty-three shelters (76.7%) admitted dogs reported by their owners as aggressive towards other dogs, and ten (23.3%) rarely admitted such dogs. No shelter indicated that dogs reported as aggressive to other dogs are never admitted. Thirty-two shelters (74.4%) conducted behavioral assessments of the dogs, 28 of which included testing for aggression towards other dogs (65.1%). Fifteen shelters (34.9%) relied exclusively on owner reports as their source of information about the dog’s level of inter-dog aggression.

Incidence and Perception of Inter-Dog Aggression

The majority of respondents (25; 58.1%) reported that inter-dog aggression was moderately common, affecting 20–49 percent of dogs in the shelter (Table 2). Most respondents estimated the proportion of dogs returned to the shelter because of inter-dog aggression as less than ten percent (Table 2), but three shelters reported a very high proportion of dogs returned for this reason. Thirty-one of the 43 shelters (72.1%) considered that more than 20 percent of owners are concerned about inter-dog aggression (Table 2). No correlation was found between the estimated proportion of dogs with inter-dog aggression and the number of dogs received per year at the shelter.
Respondents indicated how a dog’s behavior towards other dogs is likely to change after admission to the shelter (Table 3). The reported frequency of the five scenarios differed significantly ($H = 59.1$, $df = 4$, $p < 0.001$). Pairwise comparisons showed that respondents believed that the case where a dog “starts off not aggressive and stays the same” was more common than any of the other scenarios provided ($p < 0.05$).

### Management of General Aggression

The most frequently cited management practise for dogs showing any form of aggression was humane destruction (37 shelters; 86%), followed by rehabilitation within the shelter before adoption is allowed (20 shelters; 46.7%) and placing the dog in foster care (15 shelters; 34.9%). Only two shelters (4.7%) reported putting the dog up for immediate adoption. Twenty-three shelters (53.5%) also selected the “other” category; 16 of these reported that they performed an assessment of the dog, ten rehabilitated the dog outside the shelter, seven placed the dog in quarantine, one transferred the dog to another shelter, one consulted a behavior specialist,
and two placed the dog for adoption either with restrictions on potential adopters or with a warning regarding the dog’s potential for aggression.

**Management of Inter-Dog Aggression**

Most shelters reported using special management methods for dogs with inter-dog aggression. Thirty shelters (69.8%) reported that dogs with inter-dog aggression are housed differently, such as singly in a kennel with adjacent kennels empty, or with a visual barrier between the aggressive dog and neighboring dogs, or by placing the dog in an area that minimizes contact with other dogs. Of the 40 shelters with areas where dogs can be exercised in groups, 33 shelters (82.5%) did not allow dogs to participate if they showed aggression to other dogs. Thirty-five shelters (81.4%) reported using special handling restrictions for dogs with inter-dog aggression, specifically by limiting handling to experienced staff, isolating the dog from other dogs when removed from the kennel, and restraining the dog on a leash at all times outside the kennel.

Of the 41 shelters that responded to the question about rehabilitation for behavioral problems, 26 (63.4%) reported performing rehabilitation and 14 (34.1%) indicated that they had rehabilitation specifically for inter-dog aggression. Most respondents described using a “socialization” process in which the aggressive dog is exposed to other dogs on a leash or through a fence. Other strategies included stress reduction techniques (providing more time outside, providing toys in the kennel, and isolating the dog from other dogs), desensitization (rewarding the dog for non-aggressive behavior during increasingly closer encounters with a stimulus dog) and distraction (providing the dog with a toy to carry in its mouth during exposure to other dogs). The majority of respondents described the frequency and duration of rehabilitation as variable, depending on the availability of staff, time and space. Of shelters that provided rehabilitation for inter-dog aggression, more than half (8 of 14) also performed obedience training.

Rehabilitation for inter-dog aggression was performed by 14 of the 18 shelters that assessed dogs for aggression towards other dogs, but by none of the eight shelters that did not perform assessments ($\chi^2 = 13.48, p < 0.001, n = 26$). Of the 14 shelters that used rehabilitation for inter-dog aggression, ten used standardized assessment tests, three relied on informal observations by staff and volunteers, and one provided no details.

Of the 13 shelters that described their rehabilitation program for inter-dog aggression, seven judged it to be “successful” or “very successful,” four rated it as either “unsuccessful” or “very unsuccessful,” and two reported that they were “uncertain” about the program’s success.
Interestingly, the estimated proportion of dogs returned because of inter-dog aggression was similar for shelters that performed rehabilitation for this problem (11 of 14 shelters reporting that less than 20% are returned) compared to those that did not perform rehabilitation (24 of 27 shelters reporting that less than 20% are returned).

**Feasibility of Rehabilitation for Inter-Dog Aggression**

Of the 29 shelters without a rehabilitation program for inter-dog aggression, 17 indicated that such a program would not be feasible to implement in the shelter. The two most frequently cited obstacles were “lack of time” and “financial constraints” (both reported by 28 shelters), followed by “lack of expertise” and “lack of facilities” (21 shelters), “danger to other dogs” (19 shelters) and “lack of equipment” (14 shelters). Respondents also expressed concern about the liability and risk associated with releasing a dog into the community if the dog had shown inter-dog aggression in the shelter. Beyond the liability issue, other respondents expressed concerns about the effect of releasing aggressive dogs on the public’s perception of dogs and animal organizations. As one respondent noted, “Adoption of an aggressive dog may ultimately reflect badly on the dog community in general should there be an untoward display of aggression.” Another reported that dogs that have been deemed vicious are “difficult to rehabilitate” and that there would be a degree of “uncertainty of rehabilitation success.” One respondent stated that it would be “unethical to re-home an animal without serious rehabilitation.”

When 14 shelters without rehabilitation programs for inter-dog aggression were subsequently contacted by telephone, all participants reported that they would consider using a validated rehabilitation program designed specifically for use in shelters. Most respondents predicted that such a program would significantly decrease (9 respondents) or marginally decrease (two respondents) the number of dogs that would otherwise be euthanized at the shelter. As one respondent reported, “If the program was effective, then more dogs would be put up for adoption, and approximately half of the dogs that are now euthanized would be rehabilitated.” Three of the 14 respondents stated that the number of dogs euthanized would not be greatly affected; however, these were shelters that either had very low euthanasia rates (less than 10%), did not euthanize dogs for inter-dog aggression, or reported a relatively low incidence of inter-dog aggression in the shelter. Despite high levels of interest in a rehabilitation program, respondents indicated that the feasibility of such a program would depend on its efficiency and practicality within the shelter: “Implementing it would depend on how easy it is and how long it would take for each dog to improve.” Another respondent foresaw a
Figure 1. Ratings by survey participants of the (a) effectiveness, (b) practicality and (c) affordability of various techniques for the rehabilitation of inter-dog aggression.
formal rehabilitation program as a means to educate new owners and potentially increase the adoption rate of dogs with behavioral problems: “People are more receptive to adopting dogs with issues if they are given information, advice and training techniques on how to handle them and work with them.”

Effectiveness, Practicality and Affordability of Rehabilitation Techniques

The Kruskal-Wallis test showed significant differences between the seven possible rehabilitation methods in ratings of their effectiveness \( (H = 36.14, df = 6, p < 0.001, \text{Figure } 1a) \) and practicality \( (H = 17.54, df = 6, p < 0.01, \text{Figure } 1b) \), but not affordability \( (H = 9.74, df = 6, p = 0.136, \text{Figure } 1c) \). Pairwise comparisons were not significant.

Positive reinforcement was rated very or somewhat effective by 38 of the 40 shelters that commented on this method (95%), desensitization by 38 of 41 shelters (92.7%), obedience training by 37 of 40 shelters (92.5%), and counter-conditioning by 36 of 42 shelters (85.7%), whereas less support was given to correction (21 of 41 shelters; 51.2%) and distraction (27 of 42 shelters; 64.3%). Respondents rated positive reinforcement as the most practical (33 of 39 shelters; 84.6%) and affordable (31 of 39 shelters; 79.5%) of the methods; correction received the least support for practicality and affordability (20 of 40 shelters on both; 50%). Respondents showed the most uncertainty regarding the effectiveness, practicality and affordability of distraction and correction.

Discussion

This survey found that the management of inter-dog aggression is an important issue for many shelters. Respondents represented shelters which differed in size, practises, and regions. All shelters were found to admit aggressive dogs, and many acquired information about aggression from owner reports and assessment tests. Interestingly, a shelter’s total intake was not correlated with the estimated proportion of dogs with inter-dog aggression, suggesting that both large and small shelters experience the problem to a similar extent.

The incidence of inter-dog aggression was generally reported as moderate, with the majority of participants estimating its presence in 20–49 percent of dogs. Most respondents estimated that less than ten percent of dogs are returned to the shelter because of inter-dog aggression, but a few reported much higher levels. The results are comparable to the seven percent returned for aggression reported by Ledger (1998), and slightly lower than the 16 percent identified by Wells and Hepper (2000). On the other
hand, van der Borg, Planta and Netto (1991) found that inter-dog aggression was one behavioral problem shown by newly adopted shelter dogs that did not result in the dog being returned.

Most shelter employees believed that a dog’s level of aggression toward other dogs remained relatively stable over time in the shelter. This suggests that dogs starting off not aggressive towards other dogs are unlikely to develop aggression while in the shelter and that dogs showing inter-dog aggression upon admission would not normally worsen or improve over time in the shelter. This implies that most dogs with inter-dog aggression could be identified within a short time after admission to the shelter. In line with this result, Ledger and Baxter (1997) found that shelter dogs’ responses to other dogs the day after admission to the shelter corresponded with inter-dog aggression after adoption.

Over half of shelters in this survey were found to conduct some form of behavioral assessment for aggression towards other dogs, and these shelters were more likely to use a standardized assessment test and provide rehabilitation for inter-dog aggression, presumably because behavioral therapy is often chosen on the basis of a behavioral assessment (van der Borg, Planta and Netto 1991). The remaining shelters did not perform behavioral testing before re-homing, instead relying on owner reports. Despite efforts by shelter workers to obtain accurate records of behavioral problems through intake documents, it has been suggested that relinquishing owners may be under-reporting the presence of behavioral problems in their pets (DiGiacomo, Arluke and Patronek 1998; Wells and Hepper 2000; Ledger, Stephen and von Keyserlingk 2004), particularly if owners suspect it will result in euthanasia. More widespread use of standardized assessment tests by shelters to objectively assess canine aggression could improve the identification of dogs that may be unsafe to return to the community.

The most common management practise for aggressive dogs appears to be euthanasia, both in this study and others (Olson et al. 1991; Patronek et al. 1996). However, the results indicate that many shelters are currently applying behavioral intervention: 20 shelters reported rehabilitating aggressive dogs within the shelter, and 14 of these conducted some form of rehabilitation for inter-dog aggression. However, descriptions of rehabilitation methods were varied, and the frequency of rehabilitation depended on available resources. Respondents did not appear confident in the success of their rehabilitation programs as almost half (6 of 13) indicated their program was unsuccessful or were uncertain about its success.

Many shelters reported that a lack of resources prevented them from implementing rehabilitation programs. However, strong interest was
expressed for scientifically validated rehabilitation methods for shelter dogs. Shelters anticipated that such a program would likely reduce the number of dogs euthanized for aggression or released from the facility with a predisposition towards aggression. However, some respondents noted that even if an effective program were available, some uncertainty would remain about the safety of returning an aggressive dog to the community. The implementation of rehabilitation programs can broaden the function of shelters beyond housing abandoned pets (Wells and Hepper 2000), and also provide a resource for owners facing problem behavior in their pets (Tuber et al. 1999).

Of the rehabilitation techniques listed, positive reinforcement was rated as the most effective, feasible and affordable, whereas distraction and correction received the lowest ratings. Respondents were more confident in techniques such as desensitization, obedience training and counter-conditioning which are based on rewarding the dogs for desirable behavior (positive reinforcement). This result is consistent with commonly recommended treatments for aggression between unfamiliar dogs (Voith 1980; Hart and Hart 1985; Sherman et al. 1996; Overall 1997).

Distraction and correction were consistently rated lowest in effectiveness, practicality and affordability compared to other techniques. The perceived infeasibility of these methods was surprising as the equipment required (e.g. head collars and rattle cans) is inexpensive compared to the cost of staff time necessary for desensitization or increased exercise. While survey participants did not judge punishment to be a suitable treatment method, Borchelt and Voith (1985) suggest that punishment can effectively reduce an animal’s motivation to engage in inappropriate behavior if sufficient opportunities for acceptable behavior are provided. However, the lower overall ratings may reflect unfamiliarity with these techniques, or a reluctance to accept punishment-based methods.

**Conclusion**

Although most shelters humanely destroy dogs with aggression as a result of policies or liabilities associated with the re-homing of aggressive dogs, many shelters are now using rehabilitation as well. However, rehabilitation programs for inter-dog aggression varied in methods and the amount of reported success, and were hindered by a lack of resources. Considerable interest was shown for a scientifically validated rehabilitation program for reducing inter-dog aggression in shelter dogs. Such a program could potentially provide shelters with a tool for reducing the number of aggressive dogs that are adopted and the number that are returned to shelters for inter-dog aggression.
Acknowledgements

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