Aggressive Behavior in Adopted Dogs (Canis Familiaris) that Passed a Temperament Test

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Introduction

In an effort to find an objective way to measure and predict an animal's behavioral adoptability and meet the demands of stakeholders, many shelters have adopted temperament testing. This is especially important because many dogs are surrendered to shelters because of aggressive behavior (Salman *et al* 2000; Wells & Hepper 2000). There are several tests to choose from, some published and some disseminated via conferences and personal communications. They vary in length and complexity and may be administered by highly trained personnel or people newly entering the shelter field (van der Borg *et al* 1991; Netto & Planta 1997; Sternberg 2003).

Thousands of dog bites occur in the United States each year and in addition to the injury to people, the rising frequency of litigation makes protecting the public from aggressive animals increasingly important (Weiss *et al* 1998). Although temperament testing is a controversial method of assessing the behavioral traits of dogs, it is one tool that can potentially be helpful in screening for aggression, especially in conjunction with relinquishment interviews and shelter staff observations (van der Borg *et al* 1991; Segurson *et al* 2005). However, when used to screen for aggression, temperament testing is not perfect. Animals in a shelter environment, despite shelters' best efforts to maintain good animal welfare, may be suffering from occult disease, sleep deprivation, noise pollution, social stress (either from isolation or competition), and unknown emotional distress. These additional stressors inherent in shelter life may inhibit some dogs with aggressive tendencies from exhibiting them while in the shelter and even for a variable period after adoption. Furthermore, the situations simulated within any given temperament test may not stimulate a dog's triggers for aggressive behavior.

The goal of this project was to evaluate the proportion of dogs passing a temperament test that exhibited behaviors associated with aggression in their adoptive home. Our hypotheses were that some dogs with aggressive tendencies would pass the temperament test and that aggressive behavior requiring a social bond (owner-directed aggression) or a defendable space (territorial or stranger-directed aggression), or stimulation of a chase sequence (predatory aggression) would not be reliably found on this temperament test.

Materials and Methods

In order to test these hypotheses, all dogs (279) were identified that were adopted between 3/5/04 and 1/6/05 from a local animal shelter. They had been tested with a modified version of Sternberg's (2003) standardized temperament testing protocol. These temperament tests were performed by one of two people - the first author or one well-trained shelter staff member with whom the senior author worked frequently. This staff member had tested numerous dogs before the study in conjunction with the Animal Behavior Clinic. The test was always administered in the same room in an area of the shelter where none of the dogs had been. It was performed according to a list including each dog's response to various physical manipulations (opening the mouth, stroking, and hugging), environmental manipulations (loud noises, presence of cats in cages), social manipulations (removal of food/toys/rawhide, approached by friendly dog), and novel stimulus presentation (toddler-sized doll). In order to be available for adoption each segment of the test had to be passed without snarling, growling, lunging, snapping, or biting. Any dog that snarled, growled, lunged, snapped, or bit in any situation (other than resource guarding) during the temperament test was not considered adoptable and was euthanized according to shelter policy.

A telephone interview was conducted within 13 months of adoption by a person who had not interacted with the dogs or the adopters prior to the telephone call. The interviewer called the owners of all dogs adopted during the testing period who had telephone access and had legible contact information. Approximately 60 per cent of the adoption sheets had this information. If the adopters were unavailable during the first telephone call, two more attempts were made to contact them during the study period. Using this method, approximately 24 per cent of the adopters were reached.

During this interview, the adopters answered questions about house-soiling, jumping up, and separation-related behavior. They were also asked a list of questions from a standardized aggression screen used routinely for behavioral consultations

at the Animal Behavior Clinic at Cornell University. This questionnaire addresses behaviors during various physical manipulations (push on dog, physical punishment, attach leash, etc.), social situations (approached when eating or chewing on toys/food/bones, push/pull off furniture, approached by other dogs on/off leash, around children/toddlers, etc.), and situations involving territorial behavior (strangers/familiar people in the yard, behavior on walks/at gas stations/toll booths, etc.).

For those dogs displaying aggressive or potentially aggression-motivated behaviors, the aggression type (territorial, resource guarding (to humans or animals), intra-specific, predatory, and owner-directed) was classified based on the situations that stimulated the behavior (functional definitions) or the target(s) of the behavior (context-specific definitions). Territorial, predatory, and intra-specific aggression were classified according to Landsberg *et al* (2003 Ch 19). Resource guarding was used as a category in order to combine food-related aggression and possessive aggression as defined by Overall (1997 p 513-516). Owner-directed aggression was used as a category to include aggression to the owner possibly due to a variety of motivations (including social status/dominance, conflict, fear, etc.) as described by Reisner (2002). Resource guarding was assessed separately from other situations stimulating owner-directed aggression. Overall aggression level was evaluated by the owners' responses to the questionnaire for each dog and was classified into one of four groups: no aggression, low (barking only), moderate (growling or lunging, +/- barking), and high (biting/snapping, +/- [growling, lunging, or barking]).

Data Analysis

The percentages of dogs displaying various types of behaviors and levels of aggression were calculated. Comparisons of the frequency of these aggressive behaviors were performed among age groups and among sexes of dogs and owners using the chi square test of independence. In order to evaluate whether the proportion of dogs observed with various types of aggression (with the exception of resource guarding) differed significantly from zero (on the assumption that they had been screened out) a one sample proportion test was used comparing the observed percentages to 1% (since the statistical program would not accept zero). For resource guarding, we compared the observed frequency after adoption to that observed among dogs on the temperament test. P values of 0.01 were considered significant after adjusting the alpha error rate for multiple comparisons using the Bonferroni correction.

Results

Of the tested dogs, 67 dogs were eligible and their owners responded to a standardized telephone interview completed within 13 months of adoption. At the time of the telephone interview, 89.2 per cent of the dogs were still in their homes. One owner did not complete the entire questionnaire. This left 66 owner/dog pairs in the final analysis for the aggression screening questions.

Based on these interviews, types of aggressive behavior were estimated in the population. Situations that could stimulate territorial behavior elicited aggression (barking, growling, lunging, and biting) in over half of the dogs. Of dogs with territorial behaviors, the majority were in the low aggression group. In situations related to predatory behavior, approximately 14 per cent of the dogs exhibited behaviors associated with aggression (barking, growling, lunging, and biting). Most of the dogs with predatory behavior were in the moderate aggression group. Aggression to the owner was rarely reported. Among dogs with owner-directed aggression, all had moderate aggression. Resource guarding to people also occurred rarely, as did aggression over food/rawhides/toys to other dogs or cats. Only one dog was reported to be aggressive to the owner in social situations and over resources. Intra-specific aggression was reported in less than 17 per cent of the dogs.

The overall aggression level was assessed for each dog as described previously. In this assessment, the majority of the dogs were reported to exhibit behaviors that could be consistent with aggression; however, most of these dogs were in the low or moderate category. Dogs were reported only rarely to bite or snap on one or more of the aggression screen questions.

The proportions of dogs displaying territorial, intra-specific, and/or predatory aggression were all significantly higher than the expectation of no aggression ($p < 0.01$). Ideally, all aggression (except resource guarding to people) would be screened and eliminated from the adopted population by the temperament test.

Discussion:

Our results strongly suggest that there are certain types of aggressive tendencies that are not exhibited reliably during temperament testing using the techniques described above. A significant number of dogs passing this temperament test exhibited aggressive tendencies in situations suggesting motivations such as territorial, predatory, and intra-specific aggression.

Assigning dogs exhibiting barking behavior without concurrent lunging, growling, snapping, or biting to the low aggression group could be controversial since one cannot tell reliably from owner descriptions whether the dog is being aggressive as opposed to attention-seeking, etc. However, since some of the barking dogs could be barking as part of an aggressive behavioral pattern they were included in an attempt to account for as many potentially aggressive dogs as possible. Although it was assessed separately from growling, baring teeth, snapping, biting, and piloerection, including barking as a possibly aggressive behavior was also done in the van der Borg *et al* (1991) study following temperament tested dogs after adoption. Spain *et al* (2004) also included barking in their assessment of aggression in dogs when evaluating the behavioral and medical effects of early-age gonadectomy. Dogs in the low aggression category must have been barking in response to an item on the aggression screen (i.e. strangers in the yard, other dogs, at toll booths, etc.). Dogs barking when left alone or in situations not addressed on the aggression screen were not included in the overall aggression levels.

When compared to other studies investigating temperament, the adopted dogs in our study were more likely to have behaviors consistent with aggression to strangers, but less likely to have intra-specific aggression than the dogs in a study by Hsu and Serpell (2003). Compared to Wells and Hepper's (2000) study which was composed of a larger population of mostly intact animals, it is interesting that the percentage of dogs in our study exhibiting potentially aggressive behaviors (barking, snarling, growling, snapping, lunging, or biting) is much higher than the combined percentages of aggression to dogs and humans in their study. The high percentage of dogs exhibiting aggressive behaviors of any level in our study population is similar to the findings of Spain *et al* (2004).

It was hypothesized that post-adoption, owner-directed aggression would be relatively common in the population of dogs passing the temperament test. Many situations that could stimulate owner-directed aggression are evaluated in this temperament test, but the dogs presumably do not have a relationship with the temperament tester prior to testing and the evaluation quickly advances to physical manipulation of the dog. It is of interest that few dogs were reported to have owner-directed aggression during the post-adoption interview, even with these inherent limitations in the temperament test.

This may be because the post-adoption questions that related to owner-directed aggression (such as petting the dog, staring at the dog, hugging the dog, etc.) were sufficiently similar to the elements of this temperament test (stranger petting the

dog, staring, veterinary technician hug, etc.). Dogs that reacted aggressively on the test would have failed and, therefore, not been available for adoption. Alternatively, the adopters that were contacted may not have reported accurately due to recall bias, fear of repercussion for the dog, and/or concern about whether they would be blamed for the behavior.

Alternatively, the adopters that were contacted may not have reported accurately due to recall bias, fear of repercussion for the dog, and/or concern about whether they would be blamed for the behavior. These psychological influences on the reporting adopter could lead to data bias in this study. For the reasons listed above, it is likely that owners did not report some aggressive behaviors. In addition, owners of some dogs that were temperament tested during this time could not be contacted for the telephone interview. There may be a variety of logistical and emotional reasons that adopters could not be contacted. One of these is that the owners did not want to discuss the dog's behavior or disposition.

Conclusion

Despite the limitations, this study strongly suggests that significant numbers of dogs with certain types of aggression have the potential for escaping the notice of shelter workers even when employing a standardized temperament test and combining its results with shelter observation, histories, and strict euthanasia policies. The majority of dogs with aggression-associated behaviors were in the low aggression category (barking only); however, many of the dogs were in the moderate category (growling and/or lunging) and some did exhibit high levels of aggression (biting/snapping). These findings are important as we continue to refine evaluation of adoption suitability in order to protect public health and the public image of shelters and shelter dog adoptions, to improve adoption stability and retention rates, and to decrease the number of adoptable dogs euthanized each year.

Key words

Aggression, bark, dog, shelters, temperament testing

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