

## Aggression, behaviour, and animal care among pit bulls and other dogs adopted from an animal shelter

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### Abstract

Pit bull dogs are a focus of concern because of their reputation for aggression toward people and because they may be mistreated by owners who try to promote aggressive behaviour. This study followed 40 pit bulls and 42 similar-sized dogs of other breeds at an animal shelter. Three pit bulls and two dogs of other breeds were euthanised because of aggression toward people at the shelter, and the remaining 77 dogs were re-homed. Of these, one pit bull and ten dogs of other breeds were returned to the shelter because of alleged aggression. For the dogs that were retained for at least two months, owner reports of aggression in various situations (to strangers, to other dogs, etc) were similar for the two groups. Reported care of the two groups was also similar except that pit bulls were more likely to sleep on the owner's bed and more likely to cuddle with the owner. Pit bull adopters were more likely to be under the age of 30, to rent (rather than own) their home, and to be adopting their first dog, perhaps because of a bias against pit bulls among older adopters. The study provided no evidence of greater aggression or poorer care among adopted pit bulls compared to dogs of other breeds.

**Keywords:** aggression, animal shelter, animal welfare, breed, dog, pit bull

### Introduction

After an upsurge in serious dog-bite incidents in the 1980s, many jurisdictions instituted legislation limiting or banning ownership of certain dog breeds (breed-specific legislation). Affected breeds vary between jurisdictions, but 'pit bulls' (a generic term used for the bull terrier, pit bull terrier, Staffordshire bull terrier, American Staffordshire terrier, and the American pit bull terrier) have been a consistent feature in most breed-specific legislation.

Breed-specific legislation was first introduced at a national level in the United Kingdom with amendments to the Dangerous Dogs Act in 1991 prohibiting ownership and breeding of pit bulls and several other breeds. Several European countries, including Spain, Portugal, Belgium, Italy, Norway and The Netherlands then adopted national breed-specific legislation but with many variations. For example, Spain restricted the ownership of pit bulls; Norway, Portugal and The Netherlands banned pit bulls completely; and Italy banned or restricted ownership of many breeds. Some countries subsequently have repealed breed-specific laws. For example, The Netherlands and Italy repealed breed-specific legislation in 2008 and 2009, respectively, because it failed to reduce dog-bite incidence (Radio Netherlands/Expatica 2008; Government of Italy 2009).

Although public safety is the primary concern of legislators, the welfare of pit bulls is also of concern because pit bulls are thought to attract aggressive owners who keep the dogs for protection and use harsh training methods to promote aggressive behaviour. The risk of such treatment may explain why some animal sheltering organisations, including those not constrained by breed-specific legislation, choose to euthanise pit bulls rather than re-home them.

This study followed a sample of pit bulls and a matched sample of similar-sized dogs of other breeds at an animal shelter. The goals were to assess whether pit bulls were more likely to show aggression or other problematic behaviour, and to assess whether pit bulls received good care from their adoptive owners.

### Materials and methods

The study was conducted at an animal shelter of the British Columbia Society for the Prevention of Cruelty to Animals (BC SPCA) in Vancouver, Canada, one of 37 open-admissions shelters operated by this organisation. To accommodate re-homing, the BC SPCA often transfers adoptable dogs between its shelters. Some of the dogs in this study (both pit bulls and dogs of other breeds) were transferred to the Vancouver shelter from other shelters in Metropolitan Vancouver municipalities including shelters where local breed-specific by-laws precluded re-homing pit bulls. The

dog population was, therefore, drawn from inner-city, urban, suburban and rural communities in Metropolitan Vancouver's population of two million people.

No formal dog temperament screening programmes were in place at the shelter at the time of the research, but dogs with a history of biting, and dogs that were judged by animal care staff as unsuitable pets, were not considered adoptable.

### Study animals

Eighty-two dogs were admitted to the study as they entered the shelter over a four-month period. All dogs were checked for scars and other signs that they had been used as fighting dogs, and none were found. Dogs were judged to be eight months to six years of age, were medium to large in size, and had short to medium coat length. Fifty-three (65%) were male and 29 (35%) were female, a common gender ratio in shelter studies (Ledger 2000).

The dogs formed two groups. The 'Pit Bull' group (40 dogs) included all dogs considered to be American Staffordshire terriers, American pit bull terriers, pit bull terriers or crosses of these breeds. (No Staffordshire bull terriers came through the shelter during the study). Pit bull crosses were included in the study since such crosses are commonly included in breed-specific legislation. Because verification of breed is difficult for pit bulls and their crosses, candidates for the Pit Bull group were identified by both shelter and research staff based on morphological characteristics including facial structure, body shape and coat length. The 'Other Breed' group consisted of the 42 dogs that were admitted to the shelter during the same period and were similar to pit bulls in size and coat length. This group included mixed-bred German Shepherd Dogs (15), Rottweilers (9), Labrador Retrievers (9), Rough Collies (2), Chow Chows (2), Siberian Husky (1), Alaskan Malamute (1), Pointer (1), Doberman Pinscher (1), and Catahoula Leopard Hound (1).

### Procedure

The dogs were housed, handled and made available for adoption according to normal shelter protocols. The dogs were housed in ground-level kennels, usually with another dog because of space restrictions in the shelter. Five dogs that entered the study attempted to bite members of the public or staff during normal husbandry procedures and were euthanised as a result. The remaining 77 dogs were spayed or neutered (if this had not already been done) and then rehomed. Dogs that had been relinquished by their owners were eligible for adoption immediately, while stray dogs were held for several days to make them available to be reclaimed by their owners, before becoming eligible for adoption.

To adopt a dog, prospective adopters submitted an application form to shelter staff who then accepted adoption fees and completed ownership transfer agreements. At the time of the study, the shelter did little other screening of potential adopters.

As each dog was adopted, the adopters were given information about the study and were invited to participate. Upon agreement, the adopters signed a consent form giving the researcher permission to contact them for an interview appointment. All adopters agreed to participate.

Adopters who returned their dogs to the shelter within the first two months were asked to provide a reason for the dog's return. Adopters who kept their dogs longer than two months were interviewed within four months after the date of adoption. Interviews, approximately 1 h in length, were conducted in the adopter's home and were audio-recorded for transcription. A questionnaire consisting of both open and closed questions was used to guide the interview. The participants were given freedom to direct the conversation at times and were encouraged to relate stories about their experiences with their dogs. Information conveyed during the interviews was used to supplement responses to formal questions.

Adopters were asked to provide demographic information including their age range, accommodation status (home owned or rented) and previous dog experience. They were also asked about breeds of dogs that they preferred and about their motivation for adopting a dog including whether adopters had been seeking a dog for protection or as a companion for themselves or for another pet.

Adopters were asked to use a four-point scale (always, often, rarely, or never) to indicate whether the dog responded aggressively (defined as a growl, snarl, bark, snap or bite: Sherman *et al* 1996) to the owners, strangers, other dogs, cats, children, skateboarders/cyclists and joggers, or over food, when stepped over, or when moved while sleeping (Table 1). In cases where owners reported aggression, they were asked to describe its severity, and if a bite occurred, whether it broke the skin. Also using the four-point scale, owners were asked to rate whether the dogs showed certain undesirable types of behaviour including destructive chewing or digging, escaping, eliminating in the house, excessive barking, jumping on people, over-excitability, mouthing or grabbing of clothing, and pulling or lunging while on the leash (Table 1). Finally, using the same four-point scale, owners were asked to characterise their interactions with their dog by indicating whether the dog commonly slept on the owner's bed, whether it spent < 4 h alone per day, and what forms of recreation were provided (Table 1).

Of the 66 adopters that retained their dogs for at least two months, 46 were contacted successfully, and 44 agreed to be interviewed. Thirty-four face-to-face interviews were completed. Ten respondents, for reasons of convenience, completed the questionnaire and returned it by mail, but were not interviewed. Information from the mailed questionnaires was analysed separately but, because no substantial differences were found between responses from interviews and mailed questionnaires, the results were pooled to give 23 respondents in the Pit Bull group and 21 in the Other Breeds group.

### Data analysis

For each scenario (dog acts aggressively to owners, strangers, etc; Table 1), dogs were considered to show aggressive behaviour if owners scored them as 'often' or 'always' responding aggressively in that situation on the four-point scale, or if owners used terms like 'sometimes' during interviews. Responses of 'rarely' or 'never' were

**Table 1** Variables included in the study, and the number of dogs in the Pit Bull group and Other Breeds group scored as 'Yes' or 'No' for each variable.

Variable	Pit Bull		Other Breeds		P-value
	Yes	No	Yes	No	
<i>Dog acts aggressively</i>					
To owners	0	23	3	18	~0.10*
To strangers	7	14	8	13	ns
To other dogs	6	17	9	12	ns
To cats	11	11	12	6	ns
To children < 12	3	17	4	14	ns
To skateboarders/cyclists	4	17	3	17	ns
To joggers	4	19	3	18	ns
Over food	2	16	3	12	ns
When stepped over	0	23	1	19	ns
When moved while sleeping	3	20	2	18	ns
<i>Other undesirable behaviour</i>					
Chews when left alone	8	14	6	15	ns
Digs in the yard	3	20	6	13	ns
Escapes	1	22	3	18	ns
Eliminates in the house	5	18	1	20	ns
Barks excessively	1	22	1	20	ns
Jumps on people	13	10	8	13	ns
Over-excitability	13	10	8	13	ns
Mouths/grabs clothing	10	13	8	13	ns
Pulls/lunges on leash	17	6	9	12	< 0.10
<i>Owner-dog interactions</i>					
Sleeps on owner's bed	13	7	5	14	< 0.05
Spends < 4 h alone daily	15	2	9	4	ns
Taken to off-leash parks	14	4	8	8	ns
Taken to dog parks	12	3	7	9	< 0.10
Taken swimming	8	10	6	10	ns
Plays tug of war	12	6	8	8	ns
Plays fetch	14	4	12	4	ns
Plays with other dogs	9	9	3	13	ns
Cuddles with owner	22	1	15	6	< 0.05*

Notes: 'Yes' includes always, often and sometimes; 'No' includes rarely or never. Sample size was 23 for the Pit Bull group and 21 for the Other Breeds group, but numbers vary because responses were not received from all participants on all items.

\* By the Fisher exact test; all other significant differences by the Chi-squared test.

taken to indicate non-aggressive responses. Other descriptions in the interviews, for example that the dog was 'good with cats' were taken to show a lack of aggression in that context. The data thus provided 2 × 2 tables with Pit Bulls vs Other Breeds, and aggressive vs non-aggressive behaviour for each scenario. These were analysed by the Chi-square test for 2 × 2 tables in most cases, and by the Fisher exact test if one or more of expected values was < 5 (Siegel 1956). Other results (other undesirable behaviour, indicators of

owner-dog interactions, demographics) were analysed in the same way. Statistical significance was accepted at  $P < 0.05$  (two-tailed) and interesting trends were noted at  $P < 0.10$ .

## Results

Of the five dogs euthanised in the shelter for attempting to bite a person, three were pit bulls and two were dogs of other breeds. Of the remaining 77 dogs, all of which were re-homed, eleven were returned to the shelter within two months

**Table 2 Demographic features of owners adopting dogs in the Pit Bull and Other Breeds groups.**

Variable	Pit Bulls		Other Breeds		P-value
	Yes	No	Yes	No	
Age < 30 years	14	8	4	14	< 0.01*
Living single	9	14	3	16	ns
Child < 12 years in the household	1	17	2	14	ns
Rents home	15	7	5	11	< 0.05*
Lived with a dog as a child	18	4	16	2	ns
Previously owned dog as adult	8	14	15	5	< 0.05*
No breed preference when adopting	18	5	14	7	ns

\* By the Chi-squared test.

because of reported aggressive behaviour. These comprised one of the 37 pit bulls and ten of the 40 dogs of other breeds ( $P < 0.02$  by Chi-squared test).

There was no significant difference between breed groups in how many animals were reported to respond aggressively in the different situations (Table 1). The number of dogs reported to have displayed aggression towards their owner was 0 of the 23 pit bulls and 3 of the 21 dogs of other breeds ( $P \sim 0.10$ ). Similar numbers of dogs from each group were reported to display aggression in other contexts (Table 1).

Of the dogs that were reported to display aggression, there was no apparent difference between breed groups in the reported severity of the behaviour. Three dogs in the Other Breeds group, but none in the Pit Bull group, had bitten their owners with enough force to break the skin. One pit bull and three other dogs were reported to have bitten a stranger, with only one of the bites (by a dog in the Other Breeds group) severe enough to break the skin. Adopters reported no bites or injury to other animals.

There were no differences between the breed groups in other common types of undesirable behaviour, except that pit bulls showed a trend to pull more while on the leash ( $P < 0.10$ ; Table 1).

Most indicators of owner-dog interactions were similar for the two breed groups. All the dogs in the study lived indoors year round and most had free range within the home. The majority of dogs in both groups spent < 4 h alone per day. At night, significantly more pit bulls were reported to sleep on the owner's bed ( $P < 0.05$ ). More pit bulls were reported to cuddle with their owners ( $P < 0.05$ ; Table 1).

The frequency and type of exercise received by both groups were similar. Most pit bulls were provided with exercise in off-leash parks (parks with designated off-leash times) and dog parks (enclosed areas exclusively for dog activity), and most played tug-of-war and fetched objects. During inter-

views, several pit bull owners also indicated that they had taken their dogs camping, hitchhiking or on road trips. Results were similar for dogs in the Other Breeds group except that slightly fewer were taken to dog parks ( $P < 0.10$ ).

Certain aspects of adopter demographics differed between the two breed groups (Table 2). Pit bull adopters were more likely to be under the age of thirty ( $P < 0.01$ ) and to rent their place of residence ( $P < 0.05$ ). In both groups, few adopters had children under the age of 12 in the household. Most adopters in both groups had experience with family dogs when they were children but fewer pit bull adopters had previously owned a dog as an adult ( $P < 0.05$ ; Table 2).

There were no substantial differences between groups in reasons for adopting. Most adopters (30/34) stated that they were seeking a dog as a companion for themselves; fewer cited their reasons as protection (8), companionship for children (6) or companionship for another pet (5). Most participants who adopted pit bulls (18 of 23) were not looking for a specific breed when they entered the shelter, but instead were prepared to consider any breed. During the interviews, some pit bull adopters stated that they had felt cautious about adopting a pit bull but that the dog's personality had won them over. Although 14 of 21 other adopters were not looking for a particular breed when they entered the shelter (Table 2), three adopters indicated during the interviews that they had not been open to adopting a pit bull.

## Discussion

The shelter population used in this study may be different from the average dog population. Many shelter dogs are relinquished to animal shelters because of behavioural problems including aggression (Jagoe & Serpell 1996; Salman *et al* 1998; Wells 2000). Thus, dogs in shelters may be proportionately more aggressive than other dogs. This may account for the large number of dogs (11 of 77) returned to the shelter because of aggression.

The most notable difference seen in this study was the lower proportion of the Pit Bull group that was returned for aggression (1 of 37 pit bulls vs 10 of 40 dogs of other breeds). Also, of the dogs that were retained by their new owners, there was a slight tendency for fewer pit bulls to be reported as aggressive toward the owners, but there were no differences in reported aggression in other situations. Moreover, for pit bulls that did show aggression, the behaviour was reported as no more severe than the aggressive behaviour of the other breeds.

The evidence of generally lower aggression among the pit bulls should be interpreted with caution for three reasons. First, the pit bull adopters tended to be younger, and few of them had previously owned a dog apart from exposure to dogs in their childhood homes. It is possible that these owners were more tolerant than the (on average) older and more experienced group who adopted dogs of other breeds. Second, the shelter where the study was carried out accepted pit bulls from other shelters where re-homing of pit bulls was not allowed. It is possible that these feeder shelters may have done some screening of animals, and that the pit bulls

forwarded for adoption had already been subject to some selection for non-aggressive behaviour. Third, pit bulls are a genetically diverse group (Lockwood & Rindy 1987). In some regions there may be lineages with a recent history of breeding for aggression (at least to other dogs). Hence, the evidence for less aggression among pit bulls should not be extrapolated beyond the limits of this study.

The results are largely consistent with other recent findings. In an online survey of several thousand dog owners with 33 breeds represented, pit bulls were scored as the fourth most aggressive breed toward other dogs, but as having no more than average aggression toward strangers and below-average aggression toward owners (Duffy *et al* 2008). In a study of dog-bite-related fatalities in Canada from 1990 to 2007, only one of 28 deaths was attributed (in media reporting) to pit bulls, while the remainder were attributed to numerous other breeds (Raghavan 2008). In a similar study in the United States, pit bulls were most often blamed for fatalities during the 1980s, but Rottweilers were blamed for more deaths after 1993, corresponding to an increase in the popularity of that breed (Sacks *et al* 2000). Other studies have identified a high risk of biting in German Shepherds (Alsations) and Chow Chows (Gershman *et al* 1994), and among Alsations and mongrels (Klaassen *et al* 1996), but not among pit bulls. Several reports from the 1980s (summarised by Lockwood & Rindy 1987) did suggest that pit bulls have a greater propensity to bite or greater severity of biting, but this could be due partly to a bias in the media toward reporting attacks by 'pit bulls', combined with the difficulty of identifying pit bulls correctly (Lockwood & Rindy 1987; Overall & Love 2001). Indeed, analysis of breed-specific propensity to bite requires accurate information on dog bites (numerator) and on the number of dogs of each breed (denominator), and these data are generally not available (Lockwood & Rindy 1987; Overall & Love 2001). Not surprisingly, expert groups have generally advised against breed-specific legislation, partly because it may give the mistaken impression that the dog bite issue has been addressed (AVMA 2001; Overall & Love 2001).

It is commonly believed that some pit bull owners mistreat their dogs in order to encourage aggression. Indeed, ownership of dog breeds considered high-risk or 'vicious' has been linked with general deviance (Barnes *et al* 2006). In this study, however, the adoptive owners of pit bulls appeared typical of dog adopters in general, except that they were more likely to be young people with less dog experience. Most of the pit bull adopters had not specifically been seeking the breed but had made their choice based on their interactions with the individual dog while at the shelter. Thus, the pit bulls in this study were placed in relatively typical adoptive homes, with people who were tolerant of pit bulls but not seeking pit bulls, and the care provided to the pit bulls appeared similar to that provided to other dogs. However, given the reputation of the breed, potential owners who are specifically seeking a pit bull may indeed intend to treat the dog in a way that will encourage aggression. Hence, under certain local circumstances, a shelter might rationally refuse to adopt pit bulls to those adopters specifically seeking the breed.

### Animal welfare implications

Many animal sheltering organisations have adopted breed-specific policies that reduce or eliminate the re-homing of pit bulls. This is an animal welfare concern since such policies typically result in long-term sheltering or euthanasia of healthy animals. The results of this study support the inclusion of pit bulls in well-managed shelter adoption programmes and the use of screening for aggression of all shelter dogs.

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