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Environmental influences on the expression of aggressive behaviour in English Cocker Spaniels

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Abstract

A group of 'low' ($n = 217$) and 'high' ($n = 218$) aggression purebred English Cocker Spaniels were compared in relation to demographics and owner interactions. Owners of 'low' aggression dogs were more likely to be: older (65 years + ; $\chi^2 = 18.753$, $P < 0.01$) and more attached to their dogs ($U = 20346$, $P < 0.001$). Dogs in the 'high' aggression group were: significantly more likely to be of a solid colour ($\chi^2 = 38.13$, $P < 0.001$); more likely to have been chosen for pet purposes only ($\chi^2 = 25.161$, $P < 0.001$); more likely to have suffered an illness during the first 16 weeks of life ($\chi^2 = 14.899$, $P < 0.001$); groomed less often ($t = 2.252$, $P < 0.05$); given less time for walks/exercise ($t = 2.618$, $P < 0.01$); slow in obeying commands ($U = 17967.5$, $P < 0.001$), more likely to pull on the lead ($U = 16663$, $P < 0.001$); and more likely to react to loud or high-pitched noises ($\chi^2 = 14.142$, $P < 0.001$). Factors often quoted to be important in the development of dominance-related aggression, such as feeding the dog before the owner eats, a lack of obedience training, and playing competitive games with the dog, were not found to be significantly different between the two groups. Determining the importance of various factors in the development of canine aggression will enable us to better advise owners in the rearing of their dogs. © 1997 Elsevier Science B.V.

Keywords: Dog; Aggression; Human-animal interactions; Behaviour problems; Demographics

1. Introduction

Although there is a popular notion that dog owners are to blame when their dogs develop behavioural problems, there has been little empirical data to support this

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position. The evidence used to show a causal link between owners' behaviours, the owner–dog relationship, and personality tends to be anecdotal. Despite this, there are numerous popular books which purport to show the reader how to raise the perfect dog.

More recently, data from controlled studies have added new, albeit conflicting, evidence (see Voith et al., 1992; Clark and Boyer, 1993; Jagoe, 1994; Reisner et al., 1994; O'Farrell, 1995; Serpell and Jagoe, 1995; Jagoe and Serpell, 1996). Voith et al. (1992) found no relationship between the owner behaviours studied, such as 'spoiling' the dog (this included letting the dog sleep on the owner's bed, and feeding the dog from the table). In addition, no relationship between behaviour problems and whether the dog had been obedience-trained could be found. To support this finding, dog owners have previously reported that the successful completion of an obedience training course had little effect on the development or resolution of their pets' behaviour problems (Voith and Borchelt, 1982; Line and Voith, 1986; Wright and Nesselrote, 1987). Clark and Boyer (1993) found that obedience training coupled with behaviour counselling led to improvement in the human-canine relationship and significantly fewer behaviour problems. Jagoe and Serpell (1996), using a data sample of 737 dogs, found statistically significant associations between obedience training and reduced prevalence of possessive aggression, separation-related problems and escaping and roaming behaviours. In addition, sleeping close to the owner was associated with an increased prevalence of competitive aggression and separation-related problems.

The present study aimed to determine if there were any differences between owners of 'low' and 'high' aggression English Cocker Spaniels in terms of demographics, owner behaviour, and the owner–dog relationship. The breed has been linked historically to temperament problems, and in the early 1980s there was considerable media publicity in the UK relating to aggression in the breed (see Mugford, 1984; Podberscek and Serpell, 1996).

2. Animals, materials and methods

Two sub-samples were selected from a sample of 1109 English Cocker Spaniels (ECSs), which had been collected for a previous study (Podberscek and Serpell, 1996). In the earlier study, 2000 questionnaires had been randomly distributed through the postal system to UK owners of purebred ECSs. Owners were asked to rate the likelihood of their dog(s) showing aggression (on a scale of 1 to 5) in 13 different situations. From these data, aggregate scores were calculated (sum of the 13 possible rating scores for each dog). Based on the frequency distribution of these aggregate scores, the lower and upper 25th percentiles were calculated and used as cut-off points for the two sub-samples in the present study. Those in the lower 25th percentile were classified as 'low' aggression dogs while those in the upper 25th percentile were classified as 'high' aggression dogs. Following this procedure, 521 owners (owning 596 dogs) were selected for the study. Of these, 241 owned 290 'low' aggression dogs, and 280 owned 306 'high' aggression dogs.

Owners were then sent a letter explaining the project, along with a questionnaire and letter of endorsement from the Cocker Spaniel Council (UK). Replies were returned to

Table 1

The questions asked about the respondents' backgrounds (possible answers in brackets)

Background information on respondents
Age of respondent (16–24 years/25–34 years/35–44 years/45–54 years/55–64 years/65+)
Gender (male/female)
Type of housing (flat/terrace house/semi-detached/detached/other)
Own other pets? (yes/no)
Species of other pets owned
Where had the dog been acquired? (professional breeder/non-professional breeder/bred at home/pet shop/other)
Reason for obtaining pet? (to have as a pet/to have as a show dog/pet and show dog/to have as a working gundog/pet and working gundog/other)
Their attachment to the dog (5-point scale — 1: not attached; 5: very attached)
Age of dog when first acquired

the principle author using a prepaid self-addressed envelope. To confirm that the two groups were significantly different in terms of levels of aggression, a series of questions relating to this particular behaviour was included. These were as follows: (1) was the dog possessive/protective of objects, places or people? (2) was the dog aggressive to particular people? (3) was the dog aggressive when its food was approached? (4) was the dog aggressive while being groomed, bathed or when respondent tried to touch his/her toys? (5) was the dog likely to bark at strangers or other animals? The first two questions required a yes/no response while the last three used a scale of 1 to 5 for measurement (1: never or almost never; 5: always or almost always).

Owners were then asked to provide background and husbandry information (see Tables 1 and 2). In addition, they were asked questions on their dog's medical history

Table 2

The questions asked about the husbandry of the respondents' dogs (possible answers in brackets)

Husbandry details
What training had the dog received? (Formal training at obedience classes/informal training at home/mixture of formal and informal training/none)
What games did the owner play with the dog? (tug-o-war/chasing games/fetch/other)
Where did the dog sleep? (in bedroom and on bed/in bedroom but not on bed/just outside bedroom/in another room/other)
When was the dog fed? (before owner ate/after owner ate)
How often was the dog fed (per day)
Do you feed your dog tit-bits during your mealtimes? (5-point scale — 1: never, or almost never; 5: always, or almost always)
Do you feed your dog tit-bits at other times of the day? (same scale used as above)
How frequently is the dog groomed? (per week)
How frequently is the dog walked or exercised? (per day)
How much time is spent in a day playing with the dog?
How much time is spent in a day walking or exercising the dog?

Table 3

The questions asked about the medical history and behaviour of the respondents' dogs (possible answers in brackets)

Medical history and behaviours
Had the dog experienced any periods of illness before 16 weeks of age? (yes/no)
Age of dog at first vaccination? (before 9 weeks of age/9 weeks and above)
Age at which neutering had occurred (if applicable)
How quick is the dog to obey commands? (5-point scale — 1: no response to commands; 5: very quick to respond)
How much attention does the dog seek? (5-point scale — 1: does not seek attention; 5: a lot)
Does the dog ever pull on the lead? (5-point scale — 1: never, or almost never; 5: always or almost always)
Is the dog reactive to loud or high-pitched noises? (yes/no)

and behaviour (see Table 3). Data were already available from a previous study (Podberscek and Serpell, 1996) on the number of adults, children and ECSs in the household, and the sex, age, neuter status and coat colour of the ECSs.

All data were analysed using the statistical package StatView II (Abacus Concepts, Inc., Berkeley, CA, 1987). When comparing the data from the two groups of dogs, three statistical tests were used. For categorical responses, for example, 'yes', 'no' replies, Chi-Square tests were used (see Siegal and Castellan, 1988). For ordinal data, where respondents rated their dog's behaviour on a scale of 1 to 5, Mann-Whitney *U*-tests (two-tailed; see Siegal and Castellan, 1988) were used, and for interval data, such as time budgets, unpaired *t*-tests (two-tailed) were used (Marascuilo and Serlin, 1988).

3. Results

There was a total of 382 respondents (owning 435 dogs) to the survey, which represented a 73% return. Of the 435 dogs, 217 (49.9%) came from the 'low' aggression group and 218 (50.1%) were from the 'high' aggression group.

Significantly more dogs from the 'high' aggression group were protective of particular members of the family ($\chi^2 = 49.368$, $P < 0.001$); specific places in the house ($\chi^2 = 46.723$, $P < 0.001$); the respondent (against strangers, $\chi^2 = 72.003$, $P < 0.001$); particular objects ($\chi^2 = 93.676$, $P < 0.001$); and of objects in its sleeping area ($\chi^2 = 23.47$, $P < 0.001$). In addition, significantly more dogs from the 'high' aggression group were likely to become aggressive when the respondent approached its food ($U = 12855$, $P < 0.001$), while being groomed ($U = 12095$, $P < 0.001$), when bathed ($U = 17250$, $P < 0.001$), and when the respondent tried to touch/handle its toys ($U = 14514.5$, $P < 0.001$). Significantly more dogs from the 'high' aggression group were likely to bark at people that approached the house or garden of the respondents ($U = 14409.5$, $P < 0.001$) and at other dogs and animals that walked past the house or garden of the respondents ($U = 12098.5$, $P < 0.001$).

These data confirm that the two sub-samples chosen are significantly different in their levels of aggression, and hence constitute suitable ‘low’ and ‘high’ aggression groups for comparison.

3.1. Demographics

3.1.1. Respondents

The only significant difference between the demographics of the two groups of respondents, was that the ‘low’ aggression group had significantly more older people (65 + years) in it while the ‘high’ aggression group had significantly more 25 to 34 year-olds ($\chi^2 = 18.753$, $P < 0.01$; Table 4). Otherwise, the two groups were similar in family makeup and housing type, with most owning only one English Cocker Spaniel.

Table 4
Demographic data on the respondents to the survey

Variable	‘Low’ aggression group	‘High’ aggression group
<i>Age of respondents (years)</i>		
16–24	11 (5.9%)	6 (3%)
25–34	31 (16.8%)	53 (26.5%)
35–44	40 (21.6%)	60 (30%)
45–54	54 (29.2%)	49 (24.5%)
55–64	27 (14.6%)	25 (12.5%)
65 +	22 (11.9%)	7 (3.5%)
<i>Housing type</i>		
Flat	3 (1.6%)	3 (1.5%)
Terrace house	24 (13%)	39 (19.4%)
Semi-detached	61 (33.2%)	71 (35.3%)
Detached	80 (43.5%)	80 (39.8%)
Other	16 (8.7%)	8 (4%)
<i>No. of adults in household</i>		
Mean	2.3	2.3
Median	2	2
Mode	2	2
<i>n</i>	185	201
<i>No. of children in household</i>		
Mean	0.5	0.6
Median	0	0
Mode	0	0
<i>n</i>	185	201
<i>No. of ECSs in household</i>		
Mean	1.3	1.2
Median	1	1
Mode	1	1
<i>n</i>	185	201

Table 5

The reasons why respondents obtained their English Cocker Spaniel (respondents selected the reason from those provided in the questionnaire)

Reason	'Low' aggression group(<i>n</i> = 217)	'High' aggression group(<i>n</i> = 218)
To have as a pet	162 (74.7%)	197 (90.4%)
To have as a show dog	0	0
Pet and show dog	21 (9.7%)	5 (2.3%)
To have as a working gundog	21 (9.7%)	6 (2.8%)
Pet and working gundog	10 (4.6%)	4 (1.8%)
Other	3 (1.4%)	6 (2.8%)

There were significant differences in the main reasons for obtaining the dog (see Table 5). Significantly more of the respondents who owned 'high' aggression dogs wanted the dog as a pet only, while significantly more of the 'low' aggression dogs had also been wanted as show or working dogs ($\chi^2 = 25.161$, $P < 0.001$).

Most respondents were female (64% in 'low' group; 69% in 'high' group) and owned other pets (60% and 64% respectively). For both groups the most common 'other' pet was a dog (see Table 6).

There was a significant difference between the two groups in their attachment to their dogs. Respondents from the 'high' aggression group were significantly less attached to their dogs ($U = 20346$, $P < 0.001$).

3.1.2. Dogs

The mean age of the dogs in both groups was 2.8 years and the mode, 2.5 years (see Table 7), while the range of ages for the 'low' and 'high' aggression groups were 0.3 year to 17 years, and 0.3 year to 13.5 years respectively. In addition, the age at which the dogs had been acquired was also similar ('low' group: mean = 0.36 year, mode = 0.2 year; 'high' group mean = 0.32 year, mode = 0.2 year) as was the number of males and females in each group (see Table 7).

There were significantly more solid colour dogs in the 'high' aggression group and significantly more particolours in the 'low' aggression group ($\chi^2 = 38.13$, $P < 0.001$). In addition, there were significantly more neutered dogs in the 'high' aggression group and more entires in the 'low' aggression group ($\chi^2 = 6.576$, $P < 0.05$). These findings are in keeping with the results of the previous study; see Podberscek and Serpell (1996) for a detailed discussion.

Table 6

The types of other pets owned by respondents

Pet	'Low' aggression group(<i>n</i> = 111)	'High' aggression group(<i>n</i> = 129)
Dog	60 (54.1%)	65 (50.4%)
Cat	45 (40.5%)	51 (39.5%)
Bird	13 (11.7%)	16 (12.4%)
Other	33 (29.7%)	46 (35.7%)

Table 7
Demographics on the English Cocker Spaniels in the study

Variable	'Low' aggression group	'High' aggression group
<i>Age (years)</i>		
Mean	2.8	2.8
Median	2.5	2.5
Mode	2.5	2.5
<i>n</i>	217	218
<i>Gender</i>		
Male	102 (47%)	117 (54%)
Female	115 (53%)	101 (46%)
<i>Neutered?</i>		
Yes	54 (25%)	80 (36.7%)
No	163 (75%)	138 (63%)
<i>Coat type</i>		
Solid	59 (27%)	124 (57%)
Particolour	158 (73%)	94 (43%)
<i>Age acquired (years)</i>		
Mean	0.36	0.32
Median	0.2	0.2
Mode	0.2	0.2
<i>n</i>	204	213
<i>Dog acquired from</i>		
Professional breeder	135 (63%)	123 (57%)
Non-professional breeder	53 (25%)	67 (31%)
Bred at home	18 (8%)	8 (4%)
Pet shop	0	2 (1%)
Other	10 (5%)	17 (8%)

Most of the dogs had been acquired from professional breeders ('low' group, 63%; 'high' group, 57%). Only two dogs came from a pet shop and both of these were in the 'high' aggression group (see Table 7).

3.2. Medical history

Of those that had been neutered, the mean age at which this occurred was 1.6 years and the mode, 1.0 year, for both groups. However, significantly more dogs from the 'high' aggression group had had periods of illness before 16 weeks of age ('low' group, 4.9%, $n = 203$; 'high' group, 17.5%, $n = 206$; $\chi^2 = 14.899$, $P < 0.001$). Of the 'high' aggression dogs which had experienced an early illness, most had suffered diarrhoea (Table 8). The time of first vaccination was not different between the two groups, with most being vaccinated at 9 weeks of age or later (52%, 'low'; 55%, 'high').

Table 8

The types of illnesses that the dogs in the study suffered before reaching 16 weeks of age (where applicable)

Problem	'Low' aggression group(<i>n</i> = 10)	'High' aggression group(<i>n</i> = 34)
Diarrhoea	2 (20%)	18 (53%)
Eye/ear infections	2 (20%)	5 (15%)
Skin disorder	0	4 (12%)
Lameness	2 (20%)	0
Allergic response	2 (20%)	0
Other	2 (20%)	7 (20%)

Table 9

Variables related to the husbandry of the English Cocker Spaniels in the survey

Variable	'Low' aggression group	'High' aggression group
<i>Type of training</i>		
Formal training		
at obedience class	56 (26%)	67 (31%)
Informal training at home	110 (51%)	106 (49%)
Mix of formal and informal	7 (3%)	3 (1%)
None	43 (20%)	42 (19%)
<i>n</i>	216	218
<i>Games played</i>		
Tug-o-war	81 (38%)	94 (43%)
Chasing	110 (52.1%)	112 (52%)
Fetch	148 (70%)	146 (67%)
Other	36 (17%)	40 (18%)
<i>n</i>	211	217
<i>Where dog sleeps</i>		
In bedroom and on bed	29 (14%)	34 (16%)
In bedroom but not on bed	34 (16%)	43 (20%)
Just outside bedroom	12 (6%)	11 (5%)
In another room	94 (44%)	98 (45%)
Other	46 (21%)	32 (15%)
<i>n</i>	215	218
<i>Grooming frequency (no. per week)</i>		
Mean	3.7	3
Median	2	2
Mode	7	1
<i>n</i>	195	189
<i>Walk / exercise frequency (no. per week)</i>		
Mean	10.8	10
Median	7	7
Mode	7	7
<i>n</i>	210	211

3.3. Husbandry

There was no significant difference in the type of training that the dogs from the two groups had received. Most had received informal training at home ('low' group, 50.9%; 'high' group, 48.6%) while 20% of the 'low' group and 19% of the 'high' group had received no training at all (Table 9).

There was no significant difference either in the sorts of games that the respondents played with their dogs or in where the dog was allowed to sleep (see Table 9). The feeding frequency by the respondents was the same for both groups (mean = 1.4 times per day, mode = 1) with the majority of dogs being fed before the respondent ate ('low' group, 76%; 'high' group, 74%). Respondents from the 'low' group were just as likely to feed tit-bits to their dogs during and between meals as respondents from the 'high' aggression group.

Dogs in the 'low' aggression group were groomed significantly more often ($t = 2.252$, $P < 0.05$) than the 'high' aggression dogs but the frequency of walks/exercise were similar ('low' group, mean = 11 walks per week, mode = 7; 'high' group, mean = 10/week, mode = 7).

Although the amount of time respondents spent playing with their dogs was not different between the groups ('low' group, mean = 74 min per day; mode = 60 min; 'high' group, mean = 72 min per day, mode = 60 min), there was a difference in the amount of time spent walking/exercising the dogs. The 'low' aggression dogs received significantly longer walking/exercising periods ('low' group, mean = 79.5 min per day, 'high' group = 68 min per day; $t = 2.618$, $P < 0.01$).

3.4. Behaviour

Dogs from the 'high' aggression group were significantly more likely to be slow in obeying commands from the owner ($U = 17967.5$, $P < 0.001$), and were more likely to pull on the lead when walked ($U = 16663$, $P < 0.001$). However, there was no difference in the amount of attention the dogs sought.

The majority of the dogs in both groups were reactive to loud or high-pitched noises ('low' group, 55%; 'high' group, 73%), although this was significantly more so in the 'high' aggression group ($\chi^2 = 14.142$, $P < 0.001$). The majority of dogs in both groups reacted by barking ('low' group, 60%; 'high' group, 79%; see Table 10).

Table 10
The types of responses the dogs showed to loud or high-pitched noises

Behaviour	'Low' aggression group ($n = 116$)	'High' aggression group ($n = 144$)
Barks	70 (60%)	113 (79%)
Becomes excited (runs around house)	41 (35%)	21 (18%)
Hides (is frightened)	10 (9%)	18 (13%)
Other	1 (1%)	1 (1%)

4. Discussion

The homogeneity of the two groups of respondents and their dogs in terms of demographics was encouraging. Housing type, number of adults, number of children, number of English Cocker Spaniels owned, the types of other pets owned, the age and sex of the dogs, and the age at acquisition and neutering were therefore not a consideration in the interpretation of the results. The fact that this study is about only one breed of dog also overcomes the potentially confounding effects of breed differences.

It was interesting to note that there were significantly more 'older' respondents (65 + years) in the 'low' aggression group and more 25 to 34 year-olds in the 'high' aggression group. It is possible that older people have more success with their dogs because of previous experience in rearing dogs, while the younger group have had relatively little. Unfortunately, the amount of dog-rearing experience was not studied. The hypothesis, however, agrees with the findings of Jagoe and Serpell (1996) who found that dogs belonging to first time owners displayed higher prevalences of dominance-related aggression. However, Line and Voith (1986) found no associations between the prevalence of dominance aggression and the amount of dog-owning experience of owners.

The reasons for obtaining the dogs were different for the two groups. Respondents in the 'high' aggression group were much more likely to want the dog as a pet only while 'low' aggression respondents were more likely to want the dog for show or work purposes as well. As dogs chosen for either 'show' or 'working' purposes have to be trained and worked, they will receive a high degree of owner attention and handling and this should result in a well-behaved dog. Jagoe and Serpell (1996) obtained a similar result. They found that dogs acquired for breeding and/or showing had significantly lower prevalence of dominance-type aggression than dogs acquired for other reasons.

The fact that the respondents from the 'high' aggression group were significantly less attached to their dogs than those from the 'low' aggression group is probably the result rather than the cause of aggressive behaviour. Owners who were emotionally attached to their dogs and who treated them in an anthropomorphic way were found by O'Farrell (1995) to be more likely to have dogs which showed dominance aggression.

There were no differences in the proportions of dogs obtained from different sources. As these were all pure bred dogs, it is not surprising that most came from professional breeders. Serpell and Jagoe (1995) found the source of the dog to be related to the development of some canine behaviour problems. In their retrospective study of 737 dogs they found that, in general, there were fewer problems in dogs obtained from breeders, friends or relatives, or those bred at home. Problems were more likely to occur in dogs obtained from animal shelters, pet shops and those rescued off the streets.

Dogs which suffered some form of illness during the first 4 months of their lives were more likely to be aggressive later in life. This agrees with the findings of Serpell and Jagoe (1995) who found that dogs which had been ill as puppies were significantly more likely to display dominance-type aggression and other behaviour problems later in life. Although the present study did not show how long the periods of illness lasted, it is

probable that through the extra care and attention of the owners, the dogs became not only more attached to their owners but also more demanding of them.

Serpell and Jagoe (1995) found some evidence that early vaccination was associated with reduced prevalence of behaviour problems, including possessive and dominance-type aggression. The present study found no differences in the timing of vaccination in the two groups of dogs. Most dogs in both groups had been vaccinated after 8 weeks of age.

Obedience training is often recommended as a preventative and curative measure in cases of canine aggression (Blackshaw, 1985; Blackshaw, 1991; Podberscek and Blackshaw, 1990; Wright, 1991; Holmes, 1993; Reisner et al., 1994). There is some evidence to support these claims; obedience training has been found to be associated with lower prevalences of some behaviour problems (Jagoe, 1994; Jagoe and Serpell, 1996) especially when combined with behaviour therapy (Clark and Boyer, 1993). In the present study, the training the two groups of dogs were exposed to were not different, although it was not possible to determine the quality and duration of training that was employed. Voith et al. (1992) also found no relationship between the prevalence of behaviour problems in dogs and whether they had been obedience-trained.

So as to avoid the development of dominance-related aggression, it is generally recommended that owners: should not engage in competitive games with their dogs (e.g. Podberscek and Blackshaw, 1990; Neville, 1991; O'Farrell, 1992; Rogerson, 1993); should not allow their dogs to sleep on the owner's bed (Neville, 1991; O'Farrell, 1992); and that they should always feed the dog after the owner eats and not feed them from the table or when the dog commands (Neville, 1991; O'Farrell, 1992). The present study found no evidence that the types of games respondent's played with their dogs were contributing factors in the development of aggression. This is similar to the findings of Jagoe and Serpell (1996). Unfortunately, neither study attempted to assess the quality of human-animal interactions during game play. The important aspect of game play appears to be that the owner should dictate the time and duration of games and that he/she should always 'win' the game. It is possible that owners of 'high' aggression dogs were less disciplinarian with regard to game play than owners of 'low' aggression dogs and may have allowed their dogs to 'win' more in competitive games.

The dogs in both the 'low' and 'high' aggression groups were equally likely to be allowed to sleep on the bed with the owner. Therefore the sleeping arrangements did not appear to be a factor relevant to aggressive behaviour in the breed. Jagoe and Serpell (1996) found that allowing the dog to sleep in the owner's bedroom was associated with an increased prevalence of competitive aggression.

In the present study, the majority of both 'low' and 'high' aggression dogs were fed before the owner; time of feeding therefore was not an important factor. There was also no difference between the two groups in the relative frequency of feeding tit-bits during and between mealtimes, contrary to the findings of Jagoe and Serpell (1996).

The fact that 'low' aggression dogs were groomed more often than 'high' aggression dogs is most probably because the 'high' aggression dogs were significantly more likely to be aggressive during grooming.

Although the frequency of walks/exercise for the dogs was similar in both groups the amount of time the respondents spent engaged in these activities was significantly

less for dogs in the 'high' aggression group. Because 'high' aggression dogs were also more likely to pull on the lead when walked, respondents may have decided to walk/exercise for shorter periods so as to reduce the stress of such activity. Dogs that pull when on the lead are often viewed as being the dominant member of the human-dog relationship (Fisher, 1993; Holmes, 1993).

The 'high' aggression dogs were more likely to be slow to obey commands from the owner. This may reflect a trainability or dominance-related problem in the dogs, that the quality of any obedience training had been poor, or that the owners were not consistent with their obedience training.

Significantly more of the 'high' aggression dogs were affected by loud or high-pitched noises. This suggests that those dogs are generally more reactive. High-pitched noise is sometimes a trigger for aggressive behaviour in dogs (O'Farrell, 1992).

5. Conclusions

Although there are many books available on the rearing of dogs, much advice is based on anecdotal evidence and from extrapolations of wolf behaviour. The present study adds to the growing body of literature on the affects of specific environmental factors on the behavioural development of the dog. While significant associations were found between aggression in the English Cocker Spaniel and the age of the owner, early illness as a pup, and the time the owner spent walking/exercising the dog, there were no associations with factors such as feeding programme, sleeping arrangements, obedience training and the playing of competitive games. To prove that any of these significant factors actually causes or doesn't cause aggression, longitudinal studies and more specific detail about the quality of the human-animal interactions will be required.

By learning more about the ways in which the environment may affect behaviour, we will be in a better position to advise owners on how they can positively affect the behavioural development of their dogs.

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