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The English Cocker Spaniel: preliminary findings on aggressive behaviour

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Abstract

Two thousand questionnaires were distributed randomly via the Kennel Club (UK) to owners of purebred English Cocker Spaniels (ECSs). Owners were asked to give details about the ECSs they owned: age, sex, neuter status, coat colour. They were also asked to indicate whether their dog showed aggression (on a 1–5 scale; 1, never or almost never; 5, always or almost always) in any of 13 situations. These were: aggression towards strange dogs (A1), towards strangers approaching the dog (A2), towards persons approaching/visiting the home (A3), towards persons approaching the owner away from home (A4), towards children in the household (A5), towards other dogs in the household (A6), when the owner gives attention to other person or animal (A7), toward owner or member of owner's family (A8), when disciplined (A9), when reached for or handled (A10), when in restricted spaces (A11), at meal times/ defending food (A12) and, suddenly and without apparent reason (A13).

A total of 1008 (50.4%) replies was received, of which 932 (owning 1109 dogs) were suitable for analysis. Solid colour ECSs were significantly more likely to show aggression than parti-colours in 12 out of the 13 situations (A2–A13) and red/goldens were more likely to show aggression than blacks in situations A1, A4, A5 and A7–A13 inclusive. Males were significantly more likely to show aggression than females in situations A1, A8, A9 and A10 while females were significantly more likely to show aggression towards other dogs in the household (A6). When comparing ECSs which had been neutered before signs of aggression were apparent, with entires, neutered females were found more likely to show aggression towards children in the household (A5). Cluster analysis revealed six groups of associated variables; these were labelled, 'protective (of itself and owner)', 'protective (of territory)', 'intraspecific (unfamiliar dogs)', 'competitive', 'possessive', and 'dominance-type' aggression. Most dogs showed 'protective (of territory)' aggression (45.7%) while 'dominance-type' aggression was the least common (11.7%).

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The results suggest a genetic and neuroendocrine basis for the within-breed differences in aggression. Neutering was not found to be useful as a preventative measure for aggression. From the cluster analysis, there was some evidence that so-called 'rage' syndrome, a condition often reported in the breed and one which is characterised by sudden and unpredictable aggression, is an expression of social dominance, rather than being a separate or pathological phenomenon. Follow-up projects are now underway and it is hoped they will lead to a better understanding of all types of canine aggression, and provide an answer as to whether or not 'rage' truly exists as a distinct phenomenon.

1. Introduction

Although the English Cocker Spaniel (ECS) is a popular breed in the United Kingdom, it has attracted some negative publicity, especially during the early 1980s because of problems with aggressive behaviour. Mugford (1984) reported that the ECS was the third most common breed seen at his behavioural referral practice in Britain and that most (74%) cases of aggression involved those of the red/golden coat colour type. In particular, the breed has become synonymous with a condition called 'rage' syndrome, where a dog suddenly and inexplicably is aggressive towards its owners or other household members. This type of aggression has also been reported in other breeds such as American Cocker Spaniels (Dodman et al., 1992), Bernese Mountain Dogs (Van der Velden et al., 1976), Chesapeake Bay Retrievers (Dodman et al., 1992), Dobermanns (Hart and Hart, 1985), English Bull Terriers (Neville, 1991), English Springer Spaniels (Dodman et al., 1992), German Shepherds (Hart and Hart, 1985), Golden Retrievers (Fisher, 1993), Pyrenean Mountain Dogs (Neville, 1991) and St. Bernards (Hart and Hart, 1985). However, it is a rare condition (Hart and Hart, 1985; Blackshaw, 1987; Blackshaw, 1991; Reisner, 1991) and there are no published data on its prevalence in ECSs.

There are two main theories as to what this syndrome could be. First, that it is an exaggerated or unusual form of dominance aggression (Mugford, 1984; Neville, 1991; Reisner, 1991; O'Farrell, 1992). Secondly, that it is a type of epilepsy, part of a group known as complex partial seizures (Colter, 1989). It closely resembles a form of subthreshold limbic epilepsy known as episodic dyscontrol syndrome (Dodman et al., 1992) a condition for which there is some electroencephalographic evidence. Beaver (1980) reported on a condition she labelled 'mental lapse' syndrome which is similar to 'rage' syndrome and episodic dyscontrol syndrome. However, there have been no further reports of it in the literature. To date, macroscopic and microscopic investigations of the brains of dogs euthanised because of unexplained, severe aggression have revealed only a mild degree of encephalitis in some cases (Hart, 1977). Mugford (1984) argued that there may be a genetic basis for 'rage' syndrome in ECSs and Van der Velden et al. (1976) has shown evidence for this in Bernese Mountain Dogs.

To learn more about aggression in the ECS and to determine whether 'rage ' exists and if so, where it fits in the classification of canine aggression, a multi-layered study has been initiated at the University of Cambridge Veterinary School. This paper reports on the first stage of the programme which involved a large scale survey of owners of purebred ECSs.

2. Animals, materials and methods

Two thousand one-page (double-sided) questionnaires were distributed randomly through the postal system in November 1992 via the Kennel Club (UK) to UK owners of purebred ECSs. Professional breeders, however, were excluded from the study as it was thought unlikely that they would report truthfully on aggressive behaviour in their dogs. The replies were sent to the principal author using a FREEPOST address. Owners were asked to provide their name, address and phone number and to indicate how many adults and children (under 16 years of age) lived in the household. They were also asked about the number of ECSs they owned and for a description of each: name of dog, coat colour, age, sex, and whether or not it had been neutered. Finally, they were asked to consider whether their dog (a separate sheet was available for each dog) showed aggression in any of 13 situations (see Table 1). The owners indicated the relative frequency of such behaviour on a 1–5 scale for each of the 13 situations: 1, never or almost never; 2, rarely; 3, occasionally; 4, usually; 5, always or almost always.

All data were analysed using the statistical package SPSS for the Macintosh: Version 4.0. The Mann–Whitney U test (see Siegel and Castellan, 1988) was used to compare solids with particolours, red/goldens with blacks, males with females, neutered males with entire males, and neutered females with entire females in each of the 13 (A1–A13) situations in which aggression could occur (see Table 2 for N values). Agglomerative hierarchical cluster analysis, using Ward's method and squared Euclidean distances (see Hair et al., 1987), was performed on these 13 variables to determine clusters or groups of related situations. From these it was possible to label the clusters into 'types' of aggression.

In order to calculate the percentage of dogs aggressive in each of the 13 situations, the rating scale was reduced to a 'present' or 'absent' scoring system (1–2, 'absent'; 3–5, 'present'). The mean of the percentages related to each aggression group or cluster was then calculated to show the incidence of these in the ECS population.

Table 1
The 13 different situations about which the owners were asked to rate the relative frequency of their dog's likelihood to show aggression

Aggressive situation	Code
Towards strange dogs	A1
Towards strangers approaching the dog	A2
Towards persons approaching/visiting the home	A3
Towards persons approaching owner away from home	A4
Towards children in the household	A5
Towards other dogs in the household	A6
When owner gives attention to other person or animal	A7
Toward owner or member of owner's family	A8
When disciplined	A9
When reached for or handled	A10
When in restricted spaces	A11
At meal times/defending food	A12
Sudden and without apparent reason	A13

3. Results

A total of 1008 (50.4%) replies was received, of which 932 (owning 1109 dogs) were suitable for analysis. A good representation of registered ECSs was achieved as the distribution of coat colours of the survey dogs compared well with the coat colours of ECSs registered in 1992 in the UK.

Registration figures for the breed, including coat colour of the dogs, were obtained from the Kennel Club (UK) for the period 1982–1992. This was done to see if the negative publicity of the early 1980s had had an effect on preferences for the breed and for coat colour. Although the percentage of ECSs registered fell from 1982 to 1987, they then rose and continued to do so through to 1992 (Fig. 1). However, coat colour preferences showed a more sustained change. The popularity of solid colours decreased from a time when they were the most popular colour type, 1982; particolours have been more popular ever since (Fig. 2). This change in solid colour preference is due to a decrease in the number of red/goldens being registered (Fig. 3).

3.1. Demographics

The mean number of adults in the households was 2.3 (range 1–10, mode 2) and the mean number of children was 0.7 (range 0–5); only 40% of owners had children.

The mean number of ECSs owned was 1.2: 86% owned one, 11% owned two and 3% owned three or more. The mean age of these dogs was 2.7 years (range 0.25–17 years, mode 2.5 years). Solid colour dogs made up 38.6% of the sample and particolours 61.4%. Of the solid colours, 47.9% were blacks while 52.1% were red/goldens. There were similar numbers of males (545, 49.1%) and females (564, 50.9%) in the sample and most were entires (66.8% females, 82.7% males).

Table 2
N values for the various Mann–Whitney *U* tests which were performed

Variable	Aggressive situation												
	A1	A2	A3	A4	A5 [a]	A6 [a]	A7	A8	A9	A10	A11	A12	A13
Solid colour	426	428	428	426	142	373	425	428	427	428	423	426	428
Particolour	679	679	680	679	272	622	678	677	680	680	677	678	680
Red/golden	221	223	223	222	78	192	222	223	222	223	220	222	223
Black	205	205	205	204	64	181	203	205	205	205	203	204	205
Male	544	544	545	543	199	478	543	545	545	545	541	542	545
Female	562	564	564	563	215	518	561	561	563	564	560	563	564
Neutered male	94	93	94	94	33	76	93	94	94	94	94	94	94
Entire male	447	448	448	446	165	399	447	448	448	448	444	445	448
Neutered female	183	184	184	183	53	160	182	184	183	184	182	183	184
Entire female	370	371	371	371	158	349	370	368	371	371	369	371	371

[a] *N* values are smaller than for the other aggressive situations because not every owner could respond to these, i.e. because not every owner had other dogs in the house and because most (60%) did not have children.

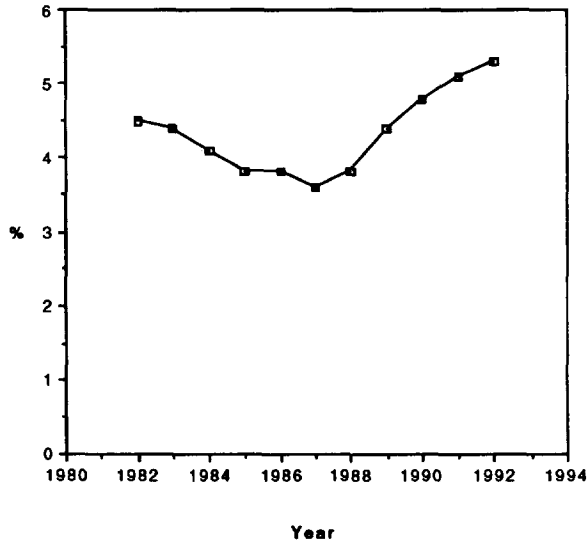

Fig. 1. The percentage of the total number of dog registrations with the Kennel Club (UK) which were English Cocker Spaniels (1982–1992).

3.2. Solid vs. particolour English Cocker Spaniels

Solid colours were significantly more likely to show signs of aggression than particolours in 12 out of the 13 situations. These included A2 (towards strangers

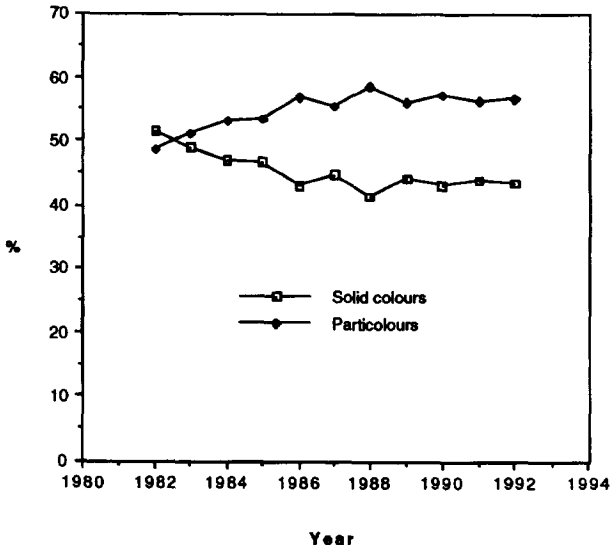

Fig. 2. The percentage of English Cocker Spaniels registered with the Kennel Club (UK) which were either solid colour or particolour (1982–1992).

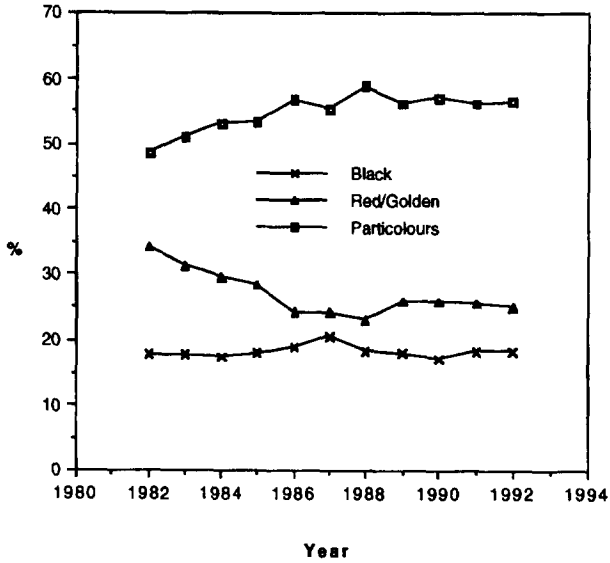

Fig. 3. The percentage of English Cocker Spaniels registered with the Kennel Club (UK) which were either red/golden, black or particolour (1982–1992).

approaching the dog; Mann–Whitney U test, $Z = 3.723$, $P < 0.001$), A3 (towards persons approaching/visiting the home; $Z = 4.213$, $P < 0.001$), A4 (towards persons approaching owner away from the home; $Z = 4.514$, $P < 0.001$), A5 (towards children in the household; $Z = 6.462$, $P < 0.001$), A6 (towards other dogs in the household; $Z = 2.163$, $P < 0.05$), A7 (when owner gives attention to other person or animal; $Z = 4.452$, $P < 0.001$), A8 (toward owner or member of owner's family; $Z = 9.766$, $P < 0.001$), A9 (when disciplined; $Z = 8.623$, $P < 0.001$), A10 (when reached for or handled; $Z = 7.255$, $P < 0.001$), A11 (when in restricted spaces; $Z = 7.631$, $P < 0.001$), A12 (at meal times/defending food; $Z = 9.547$, $P < 0.001$), and A13 (sudden and without apparent reason; $Z = 8.057$, $P < 0.001$).

3.3. Red/goldens vs. black English Cocker Spaniels

Within the solid colour group, red/goldens were compared with blacks. Here it was found that red/goldens were significantly more likely to be aggressive in a number of situations. These included, A1 (towards strange dogs; Mann–Whitney U test, $Z = 2.582$, $P < 0.01$), A4 (towards persons approaching owner away from home; $Z = 2.774$, $P < 0.01$), A5 (towards children in the household; $Z = 3.365$, $P < 0.001$), A7 (when owner gives attention to other person or animal; $Z = 3.336$, $P < 0.001$), A8 (toward owner or member of owner's family; $Z = 4.988$, $P < 0.001$), A9 (when disciplined; $Z = 4.524$, $P < 0.001$), A10 (when reached for or handled; $Z = 3.161$, $P < 0.01$), A11 (when in restricted spaces; $Z = 2.4$, $P < 0.05$), A12 (at meal times/ defending food; $Z = 3.492$, $P < 0.001$), A13 (sudden and without apparent reason; $Z = 3.643$, $P < 0.001$).

3.4. Males vs. females

Males were more likely to be aggressive than females in situations A1 (towards strange dogs; Mann–Whitney U test, $Z = 2.02$, $P < 0.05$), A8 (toward owner or member of owner's family; $Z = 2.089$, $P < 0.05$), A9 (when disciplined; $Z = 4.459$, $P < 0.001$) and A10 (when reached for or handled; $Z = 2.235$, $P < 0.05$). Females were more likely to be aggressive than males in situation A6 (aggression towards other dogs in the household; $Z = 2.763$, $P < 0.01$) only.

3.5. Neutered males vs. entire males

Neutered males were found to be significantly more aggressive than entire males in situations A5 (towards children in the household; Mann–Whitney U test, $Z = 3.967$, $P < 0.001$), A8 (toward owner or member of owner's family; $Z = 4.066$, $P < 0.001$), A9 (when disciplined; $Z = 4.032$, $P < 0.001$), A10 (when reached for or handled; $Z = 4.28$, $P < 0.001$), A11 (when in restricted spaces; $Z = 2.917$, $P < 0.01$), A12 (at meal times/defending food; $Z = 2.724$, $P < 0.01$), and A13 (sudden and without apparent reason; $Z = 4.736$, $P < 0.001$).

3.6. Neutered females vs. entire females

Neutered females were found to be significantly more likely to be aggressive than entire females in situations A2 (towards strangers approaching the dog; Mann–Whitney U test, $Z = 1.963$, $P < 0.05$), A3 (towards persons approaching/visiting the home; $Z = 2.494$, $P < 0.05$), A4 (towards persons approaching owner away from home; $Z = 2.74$, $P < 0.01$), A5 (towards children in the household; $Z = 3.246$, $P < 0.01$), A8 (toward owner or member of owner's family; $Z = 3.289$, $P < 0.01$), A9 (when disciplined; $Z = 4.127$, $P < 0.001$), A10 (when reached for or handled; $Z = 2.805$, $P < 0.01$), A11 (when in restricted spaces; $Z = 2.211$, $P < 0.05$), A12 (at meal times/defending food; $Z = 2.465$, $P < 0.05$), and A13 (sudden and without apparent reason; $Z = 2.458$, $P < 0.05$).

3.7. Follow-up study

As the neutering results were surprising it was decided to further investigate the effects of neutering by contacting the owners of all neutered ECSs and asking for details on (1) age at which aggression started (if dog was aggressive at all), (2) age at which the dog was neutered and (3) why the dog was neutered. Data were collected on 149 (81%) neutered females and 73 (78%) neutered males. The mean age at which aggression started was 0.9 years (11 months) for males and females, while the mode was 0.5 years (6 months) and 0.2 years (2 months), respectively. Neutered dogs were once again compared with entires using the Mann–Whitney U test for each of the 13 situations in which aggression could occur. However, this time dogs which were neutered because they were aggressive and those which were neutered after aggressive behaviour had first started, were excluded (neutered males $N = 55$, neutered females $N = 139$). This would

Table 3
The components of each cluster and the labels assigned

Cluster label	Components
Protective (of itself and owner)	Aggression towards: strangers approaching the dog (A2) persons approaching owner away from home (A4)
Protective (of territory)	Aggression towards persons approaching/visiting the home (A3)
Intraspecific (unfamiliar dogs)	Aggression towards strange dogs (A1)
Competitive	Aggression: towards other dogs in the household (A6) when owner gives attention to other person or animal (A7)
Possessive	Aggression at meal times/defending food (A12)
Dominance-type	Aggression: toward owner or member of owner's family (A8) when disciplined (A9) when reached for or handled (A10) when in restricted spaces (A11) sudden and without apparent reason (A13)

then tell us if neutering was in some way a precursor to aggression. The results of this analysis revealed that neutering was probably the consequence of aggressiveness rather than the cause. All statistically significant differences between neutered and entire males disappeared when dogs which had been neutered either after or because they became aggressive were removed from the sample. The same was largely true for females,

Table 4
Mean percentage of English Cocker Spaniels showing a particular category of aggression

Aggression category	Components	*N* (aggression present)	Total *N*	%	Mean % for category
Protective (of itself and owner)	A2	198	1108	17.9	15.2
	A4	138	1106	12.5	
Protective (territory)	A3	507	1109	45.7	45.7
Intraspecific (unfamiliar dogs)	A1	317	1106	28.7	28.7
Competitive	A6	184	996	18.5	17.8
	A7	190	1104	17.2	
Possessive	A12	266	1105	24.1	24.1
Dominance-type	A5	44	414	10.6	11.7
	A8	124	1106	11.2	
	A9	184	1108	16.6	
	A10	124	1109	11.2	
	A11	126	1101	11.4	
	A13	91	1109	8.2	

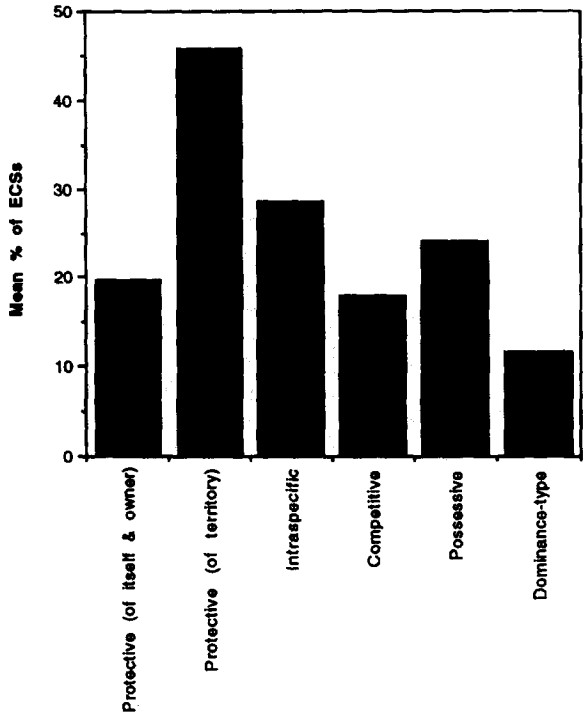

Fig. 4. The mean percentage of English Cocker Spaniels showing any of the six types of aggression determined by the cluster analysis.

except that neutered females were now found to be significantly more likely to display aggression towards children in the household (Mann–Whitney U test, $Z = 2.015$, $P < 0.05$).

3.8. Cluster analysis

Changes in agglomeration coefficients between cluster stages were used to determine the number of significant clusters; a six cluster solution was achieved. This solution was cross-validated using the technique of split sample replication (see Hair et al., 1987 for details). The six groups or clusters were labelled ' protective (of itself and owner)', 'protective (of territory)', 'intraspecific (unfamiliar dogs)', 'competitive', ' possessive', and ' dominance-type' aggression (see Table 3).

The percentage of dogs which were aggressive (scored 3, 4 or 5 on the rating scale) in any of the 13 situation variables and the mean percentage which displayed a particular type or category of aggression are provided in Table 4. Most ECSs (45.7%) showed protective (of territory) aggression while dominance-type aggression was least common (11.7%; Fig. 4).

4. Discussion

The interpretation of the results of this study rests heavily on the reliability and validity of the methods used to measure aggressive behaviour. When completed by persons familiar with the animals being assessed, subjective rating scales of the type employed here have been found to provide reliable measures of individual differences in behaviour in laboratory rhesus monkeys (Stevenson-Hinde et al., 1980; Stevenson-Hinde, 1983) and domestic cats (Feaver et al., 1986). However, although comparable techniques have also been used to elicit owner assessments of both dog (Serpell, 1983; Serpell and Jagoe, 1995) and cat (Turner and Stammbach-Geering, 1990) behaviour, their accuracy and reliability have not been tested. This raises the possibility that any observed differences between different subgroups within the same population of ECSs are simply artefacts of biases in owners' perceptions. For example, it is possible (though unlikely) that the owners of solid colour ECSs tend to perceive them as being more aggressive than do the owners of particolour dogs, regardless of any actual differences in behaviour. The use of quantitative rather than qualitative rating scales would be expected to reduce the likelihood of these kinds of subjective biases.

It should also be emphasised that, while the present findings are statistically highly significant in many cases, the overall effect sizes are relatively small. In other words, a finding that is probably true for the sampled population as a whole, for example, solid colour ECSs are more aggressive than particolours, is unlikely to be reliable at the level of the individual dog.

Coinciding with the negative publicity about the breed during the early 1980s, the percentage registered with the Kennel Club (UK) dropped but then rose again in the latter part of that decade. However, a more decided change occurred with coat colour preference. The decrease in popularity of the solid colours, especially the red/goldens, suggests that the negative publicity had a sustained effect. The ability of the print media to affect human attitudes and preferences to particular breeds of dog has been discussed previously by Podberscek (1994).

The existence of significant behavioural differences between the different colour morphs of the breed is interesting in the light of the view of Hemmer (1990) that coat colour in domestic animals is often closely associated with temperament (the hypothesis is based on the fact that the pigment melanin shares a common biochemical synthesis pathway with the catecholamine group of neurotransmitters). The fact that solid colour animals were more aggressive than particolours in 12 out of the 13 different contexts certainly suggests a genetic basis for this difference. It does not, however, provide support for Hemmer's theory since the bloodlines of these two colour variants are known to be quite distinct (Lloyd Carey, 1992). In addition, within the solid colour group, the red/golden variety was more aggressive, on average, than the black, and this agrees with the findings of Mugford (1984) who also noted that the red/golden variant appeared to be more inbred. Current follow-up research on the pedigrees of a subset of aggressive and non-aggressive dogs should help to clarify this issue.

A further interesting theoretical issue raised by the present findings concerns the apparent evidence for 'global' genetic effects on aggressiveness. According to the conventional view, different forms of aggressive behaviour, such as territorial or

dominance-related aggression, are differently motivated and therefore likely to be under the influence of separate genetic and physiological controls (see Serpell and Jagoe, 1995). Indeed, the ways in which the different behaviour patterns grouped in the cluster analysis is broadly consistent with this idea. The differences in aggressiveness between solid and particolour ECSs were, however, virtually consistent across all the different aggressive contexts, and this would suggest some underlying causal link. It is possible that solid colour forms (especially red/goldens) are simply more 'reactive' to stimuli (sensu Hart and Hart, 1985) than particolours in a general way. Unfortunately, the reactivity of the dogs in other, non-aggressive contexts was not measured in the present study. In any case, the possible genetic and neuroendocrine basis for these apparent within-breed differences in overall aggressiveness would probably repay more detailed investigation.

Although there are many examples in the literature suggesting that male dogs are more likely to be aggressive than females (see Borchelt, 1983; Mugford, 1984; Wright and Nesselrote, 1987; Podberscek and Blackshaw, 1990; Blackshaw, 1991; Landsberg, 1991; Wright, 1991; Beaver, 1993; Podberscek and Blackshaw, 1993) this was only supported in four out of the 13 situations recorded, and females were more aggressive than males in one situation (aggression towards other dogs in the household). One of the reasons for this difference could be that some researchers have not looked for sex differences in the different types of aggression, rather they have lumped all types together. Also, and more importantly, most studies do not have a control group of randomly selected dogs and therefore it is not possible to say whether either sex is actually overrepresented. To support the present findings, Scott and Fuller (1965, p. 419) found reduced sex differences in aggressiveness in relatively non-aggressive breeds, such as the (American) Cocker Spaniel, compared with aggressive breeds such as Fox Terriers and Basenjis, particularly with respect to social dominance. Males in the present study were more likely to be aggressive towards strange dogs and this also was the only component of the 'intraspecific (unfamiliar dogs)' cluster. Most cases of this sort of aggression have been attributed to males and usually involve male to male fighting and may be affected by circulating androgens (Borchelt, 1983; Hart and Hart, 1985; O'Farrell, 1992).

Females were more likely to be aggressive towards other dogs in the household and this may be because these households owned other female dogs; females rarely fight with males (see Borchelt, 1983). Unfortunately, the composition of the households in terms of the number and sex of other dogs was unknown.

Male dogs neutered before signs of aggression had appeared were not different from entire males in their likelihood of showing aggression in any of the 13 situations. This implies that neutering was not effective in preventing aggression and agrees with the findings of Le Boeuf (1970) and Salmeri et al. (1991). Other research, however, has indicated that neutered dogs are less aggressive than entires (Beaver, 1983; Borchelt, 1983; Wright and Nesselrote, 1987; Blackshaw, 1991). These previous studies, however, are based on cases presented to behavioural clinics without data on the age at which neutering took place being collected or at least this was not taken into account in the analyses. Hopkins et al. (1976) found that intermale fighting decreased when adult dogs were castrated but that territorial and fear-induced aggression were not.

Compared to entire bitches, female ECSs which were neutered before they showed any signs of aggression were only more likely to show aggression towards children in the household. There are a number of studies which have indicated that neutered females are more likely to be aggressive than entires (Borchelt, 1983; Wright and Nesselrote, 1987; O'Farrell and Peachey, 1990). However, Blackshaw (1991) in her study of 87 cases of canine aggression, found that neutered females were the smallest group. Only O'Farrell and Peachey (1990) have conducted a systematic and scientific study on the effects of neutering in bitches. Their study of 150 bitches whose behaviour was assessed before and after neutering and compared with a control group of 150 entires showed that dominance aggression increased significantly after neutering compared with controls. This increase was most likely to be shown in puppies under one year of age which were already showing signs of aggression. A difference in the present study is that dogs aggressive before neutering are not included in the analyses thus indicating that neutering is not a preventative measure for aggression in bitches and should be avoided especially if there are children in the household.

The mean age at which aggression started for both the neutered males and females in the follow-up study was 11 months while Mugford (1984) reported a mean age of onset of 7.4 months from his sample of ECSs. Females in the present study most commonly started to show signs of aggression at 2 months of age while males started most commonly at 6 months. This difference is most probably related to the onset of puberty in males with its associated large rise in testosterone secretion (Hart and Hart, 1985).

The types of aggression determined by cluster analysis generally fitted the classification schemes detailed by Borchelt (1983) and Beaver (1993). However, the present study did not cover all possible types of aggression; for example, pain-induced or maternal aggression were not explored. The most common type of aggression shown by the ECSs was protective (territorial) and the least common, dominance-type. This does not agree with most of the available literature on canine aggression. Dominance aggression is usually reported as the most common type of aggression treated at behavioural clinics (Beaver, 1983; Borchelt, 1983; Line and Voith, 1986; Blackshaw, 1991; Beaver, 1993) while the percentage of dogs showing territorial aggression has ranged from 5.5% of aggression cases (Beaver, 1993) to 29% (Blackshaw, 1991). However, Scott and Fuller (1965) found exceptionally low levels of social dominance in (American) Cocker Spaniels compared with some of their other breeds. In the present study, intraspecific aggression was high (28.7%) but this is not commonly treated at behavioural clinics (Borchelt, 1983; Blackshaw, 1991; Landsberg, 1991). Possessive aggression was a common form of aggression seen in the ECS and this has also been reported by Mugford (1984); however, it is not a commonly treated problem at behaviour clinics (Borchelt, 1983; Beaver, 1993) The reasons for the differences between the present data and those reported from behavioural clinics are most probably related to the owners wants or needs; that is, they want their dog to be aggressive towards strangers, to protect them, but they don't want their dog to bite them. Therefore not many protective dogs will be taken to a behaviourist. That being said, reports based on behavioural clinic cases offer a biased view on the behaviour of dogs in general; the dogs are usually showing extreme expressions of an 'abnormal' or distressing behaviour. Also, the samples are biased because only a select number of people actually take their dog to a specialist behavioural

clinic; others either tolerate the behaviour or the dog is abandoned or euthanised. Therefore, clinical data sets provide information on the types of aggression that are unacceptable to owners but do not necessarily provide any data on the prevalence of behaviour problems. Also, many of the previous studies have not taken breed differences into account. The present study overcomes these biases and puts the various types of aggression of a particular breed, into a societal context.

The results of the cluster analysis revealed that the tendency of ECSs to display aggression 'suddenly and without apparent reason' was clearly associated with other typical symptoms of dominance-type aggression. This finding offers some evidence that so-called 'rage' syndrome, which is usually characterised by its sudden and unpredictable onset, is an expression of social dominance conflicts, rather than being a separate or pathological phenomenon. Although we cannot be certain at this stage that dogs exhibiting aggression 'suddenly and without apparent reason' are actually suffering from 'rage' as it is generally defined clinically, we will be investigating this possibility further in the second stage of this project.

Breed-specific studies of canine aggression are rare. They are, however, extremely useful as a means of eliminating the potentially confounding effects of breed differences in temperament. This study provides important information on the prevalence of different types of aggression in the English Cocker Spaniel. It is also the first published study to validate scientifically the popular reports of aggressive problems with the solid, and in particular the red/golden, colour dogs. Follow-up studies will consider other factors which may be relevant to the development of aggression in this breed and to provide an answer as to whether or not 'rage' truly exists as a distinct phenomenon.

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