Prevalence of some behavioral problems in two groups of rescue dogs: *galgos* from Spain and other dogs

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Abstract: Behavioral problems are often the cause of dog relinquishment and adoption failure. We investigated the prevalence of some possible behavioral problems in rescue *galgos* from Spain and other rescue dogs using a dedicated online questionnaire. Answers for a total of 410 dogs (198 *galgos*, 212 other dogs) were analysed. "Out of context fear of loud noises, fireworks, thunderstorms", "Poor recall", "Predatory behavior toward cats", "Predatory behavior toward other animals" and "Shadowing the caretaker" were reported in more than one dog out of five for both *galgos* and other dogs. "Eating faeces" and "Out of context fear of non-co-habiting adult people" were reported in more than one dog out of five in *galgos,* but not in other dogs. "Excessive requests for attention" and "Inadequate behavior when on the leash" were reported in more than one dog out of five in other dogs, but not in *galgos*. *Galgos* were more often reported as showing "Eating faeces" (p=0.002) and "Out of context fear of non-co-habiting adult people" (p=0.009) than other dogs, whereas dogs who had been longer with the family (i.e., longer adoption length) were more often reported as being afraid of loud noises, thunderstorms, and fireworks. These findings may contribute to increasing the knowledge available about the challenges experienced during the adoption of different types/breeds of dog and, thus, to-facilitate targeted individualised interventions in order to mitigate behavioral problems.

Introduction

The most cited causes of break-down in the human-dog relationship are those related to human factors (such as housing factors), however, behavioral problems, especially those not related to aggression, are often a cause of dog relinquishment and adoption failure (Protopopova & Gunter, 2017). Relinquishment of pets can be a significant issue not only for the welfare of the animal being relinquished, but also for the human family (DiGiacomo et al., 1998, Shore, 2005) the environment and society generally (Bernete Perdomo et al., 2021). Even when the dog is retained, behavioral problems can be associated with reduced welfare for both the dog and the caretaker (for a review of the effects on caretakers, please see Barcelos et al., 2024). From a One Welfare perspective, where One Welfare is a framework that describes the interconnection between animal welfare, human wellbeing and their environment (Pinillos, 2021), it is therefore important to investigate behavioral problems shown by rehomed dogs in order to target interventions to prevent or successfully treat the most likely behavioral problems. In this regard, it is important to note that different populations of rehomed dogs can vary in their likelihood of showing different behaviors that could be perceived as problematic by their caretakers (Normando et al. 2021). For example, using a similar questionnaire to that used by Marston et al. (2005), Elliot et al. (2010) found that rescue greyhounds were reported less often as being hyperactive or noisy, to exhibit

pulling on the lead, mouthing, or escaping. Instead, they were more likely to be reported as exhibiting destructiveness and inappropriate elimination 'some of the time' or more often, one-month post-adoption, than non-greyhound rescue dogs.

Therefore, the aim of the present study was to investigate the prevalence of some behavioral problems in two different populations of rescue dogs, as reported by their caretakers, and to identify factors associated with the presence of the most frequent problem behaviors.

People, Animals, Materials and Methods

A convenience sample of Italian speaking respondents was recruited using an on-line questionnaire, advertised by means of rescue associations, social media and word of mouth. All adult people (age≥18 years) who had rehomed dogs from dog pounds, shelters and volunteer organizations were eligible to participate as proxy respondents for the dog they had rehomed. The complete questionnaire can be found as supplementary material to Normando et al. (2021). The sections about presence/absence of some dog behavior which could be perceived as problem behavior (called "behavioral problems" – BP hereafter), will be discussed here.

Most common BPs (those affecting at least 20% of either *galgos* or other dogs) were analysed in relation to some characteristics of the respondent and the dog, using Generalized linear models (General Estimation Equations) with the dependent variable as a dichotomic variable (presence/absence). In the initial models the following factors and interactions were included: dog's type (*galgo*, other dogs), dog's sex (male vs female), dog's age, owner's gender (man, woman, missing), owner's age, length of adoption (in days), presence of chronic health problems of the dog, presence of another dog in the household, and interaction type of dog*dog's sex. Only factors or interactions which were significant in the initial model were retained in the final one. Due to distribution of the data, we had to eliminate the two entries in which the respondent had declined to give their gender from the analyses regarding "Excessive requests for attention" and "Out of context fear of loud noises, fireworks, thunderstorms".

It might be important to note that the factor "type of dog" was originally on four levels (*galgos* from Spain, other sighthounds, *podencos*, and non-sighthound non-*podenco* dogs) in the questionnaire. Other sighthounds and *podencos*, had been thought to be a useful control for possible general sighthound characteristics and similar rehoming process, respectively. However, due to the low response rate for other sighthounds and *Podencos*, they were compiled into the "other dogs" group.

Results and discussion

Answers for a total of 410 dogs (198 *galgos*, 212 other dogs; mean age ±SD = 5.19 ± 3.18 years; adoption length= 807.49 ± 973.19 days) were received and included in the analyses. The "other dogs" group included 17 *podencos* and 35 other sighthounds (e.g., greyhound, saluki, whippet, sloughi). Overall, only 37 dogs (9.0%) were intact, whereas the rest were neutered/desexed.

The prevalence of the investigated BP is shown in table 1. The three most reported BPs overall were "Predatory behavior toward cats", reported in 39% of the dogs, followed by "Out of context fear of loud noises, fireworks, thunderstorms" reported in 34% of the sample, and "shadowing the caretaker" 33% (i.e., following the caretaker from room to room in the house). Other BP's reported in more than 20% of the overall sample were: "Inadequate behavior when on the leash", "Out of context fear of non-co-habiting adult people", "Poor recall", "Predatory behavior toward other animals". In detail, "Out of context fear of loud noises, fireworks, thunderstorms", "Poor recall", "Predatory behavior toward cats", "Predatory behavior toward other animals" and "Shadowing the caretaker" were reported in more than one dog out of five for both *galgos* and other dogs.

"Eating faeces" and "Out of context fear of non-co-habiting adult people" were reported in more than one dog out of five in *galgos*, but not in other dogs. "Excessive requests for attention" and "Inadequate behavior when on the leash" were reported in more than one dog out of five in other dogs, but not in *galgos*. "Inadequate behavior when on the leash", "Poor recall" and "Shadowing the caretaker" were discussed in regards to satisfaction in Normando et al. (2021) and will not be analysed any further here.

The most frequent behaviors found in the present study partially differ from that found by Yamada et al. (2019). In their study, barking at noises inside the house, barking at unfamiliar visitors and pica (defined as: "trying to eat non-food items") were the three most common problems. In the present study, excessive vocalizations were reported in less than 13% of the dogs. With regard to pica, it is important to note that the specific BPs investigated and the scale of response differed between the two studies. In particular, in our study, coprophagy, which can be considered a form of pica in general, was divided from eating other non-edible materials/objects, also part of pica. In the present study, coprophagy was indeed among the most common behavior, especially for *galgos*, affecting around 17% of the dogs overall, whereas 8.8% of the dogs, were reported as eating other non-edible materials/objects, but not faeces (total dogs eating non-food items: 25.7% of the sample). A coprophagy prevalence (16%) similar to the one found in the present study, was found by Hart et al. (2018), although their study focused only on coprophagy directed to the faeces of conspecifics, and dogs were classified as coprophagic if they had been seen eating faeces at least 6 times. The percentage of dogs being reported as eating conspecifics' faeces at least once was 23%, which is higher than that found in the present study. Another study finding a similar prevalence (17%) of coprophagy was Dinwoodie et al. (2019). All the aforementioned studies, however, targeted dogs in general, and were not restricted to rescue ones.

The percentage of dogs reported to be afraid of thunderstorm/noises/fireworks in the study by Yamada et al. (2019), around 39%, is somewhat similar to what was found in the present study, especially when only *non-galgos* were considered. A higher prevalence (49%) of dogs being afraid of thunderstorms was found in another study on Italian dogs, but not restricted to rescued ones (Mengoli et al., 2012). The three most reported BPs in the New Zealand rescue dogs studied by Gates et al. (2018), were "poor manners" (46%), destruction of household items (30%), and excessively high energy (28%). Except for the first, which was not included in the present study as such, the other two BPs were markedly less often reported in our sample. However, a significant difference exists between *galgos* and other rescue dogs in destructiveness and excessive activity, with the former being reported less as showing the behavior/trait, as already shown in Normando et al. (2021). It is interesting to note, though, that the percentages in our study are still less, even if only non-*galgos* are considered.

Table 1. prevalence of the studied behaviors (% on non-missing values) in *galgos* (tot n=198) and other (tot. n=212) rescue dogs in the sample.

Behavior	% galgos	Missing (galgos)	% non-galgos	Missing (non-galgos)	% Total
Aggressive behavior toward co-habiting adult people	0.0	0	4.3	1	2.2
Aggressive behavior toward co-habiting children	0.5	0	1.9	6	1.2
Aggressive behavior toward co-habiting dogs	4.1	1	3.9	5	4.0
Aggressive behavior toward non-co-habiting adult people	4.1	1	6.7	2	5.4
Aggressive behavior toward non-co-habiting children	0.5	0	3.9	6	2.2
Aggressive behavior toward non-co-habiting dogs	5.1	2	20.4	1	13.0
Aggressive behavior toward other animals	9.2	3	19.1	3	14.4
Being too active	4.5	0	19.8	0	12.4

Destructivness (not linked to be left alone)	3.0	1	10.0	2	6.6
Eating faeces	22.7	0	11.4	1	16.9
Eating other inedible substances	9.1	0	16.2	2	12.7
Excessive requests for attention	9.7	2	24.1	0	17.2
Excessive vocalizations (not linked to being left alone)	10.1	0	14.2	0	12.2
Inability to cope with frustration	10.8	3	14.9	4	12.9
Inabilty to play	13.1	0	12.8	1	13.0
Inadequate behavior when on the leash	11.6	0	31.9	2	22.1
Not being interested in social interactions with other dogs	11.7	1	9.0	2	10.3
Not being interested in social interactions with people (including co-habiting people)	9.1	0	8.1	1	8.6
Not sleeping during the night	1.5	1	0.9	0	1.2
Out of context fear of almost everything (generalised fear)	16.2	0	18.2	3	17.2
Out of context fear of children	13.3	2	9.6	3	11.4
Out of context fear of co-habiting adult people	6.6	0	4.2	0	5.4
Out of context fear of loud noises, fireworks, thunderstorms	27.4	1	40.7	3	34.2
Out of context fear of non-co-habiting adult people	26.0	2	16.0	0	20.8
Out of context fear of other dogs	15.8	2	17.1	1	16.5
Out of context fear of the urban environment	19.4	2	18.8	4	19.1
Poor recall	20.2	5	25.2	2	22.8
Poor self-control	10.7	1	19.0	1	15.0
Predatory behavior toward cats	41.5	5	36.7	2	39.0
Predatory behavior toward other animals	29.9	4	33.5	3	31.8
Predatory behavior toward small dogs	8.7	2	11.0	2	9.9
Predatory behavior toward vehicles, etc	2.0	2	8.5	1	5.4
Roll on faeces or carcasses	14.2	1	19.4	1	16.9
Separation distress	10.2	1	14.7	1	12.5
Shadowing the caretaker	27.4	1	38.1	2	32.9

For all the investigated dependent variables, the intercept was always highly significant (p<0.001) in all the models, both initial and final, showing that the part of data variability not explained by the included factors was high. This is a rather common finding in behavioral analysis as behavior is a very complex phenomenon affected by complex interactions of many (both past and present) factors, genetic and environmental.

Of the investigated possible behavioral problems; no factor resulted in significance in the initial models for "Excessive requests for attention" and "Predatory behavior toward cats" and they were not analysed further. In this respect, the lack of an effect of type of dog on predatory behavior toward cats and other animals, is rather surprising, as sighthounds are known for their predatory drive (Howell & Bennet, 2020). The interaction between type of dog and sex of the dog was significant for "Predatory behavior toward other animals" in the initial model (p=0.025), but showed only a tendency (p=0.051) in the final model. The results of the final model analyses regarding the other behaviors are shown in table 2.

Table 2. Factors associated to the reported presence of possible problem behaviors.

Behavior	Significant factor	Wald chi-square	p=	Effect
Eating faeces	Type of dog	9.55	0.002	*Galgos* > other dogs
Out of context fear of non-co-habiting adult people	Type of dog	6.75	0.009	*Galgos* > other dogs
Out of context fear of loud noises, fireworks, thunderstorms	Adoption length (days)	9.68	0.002	Longer length: higher prevalence of behavior

The factor which was associated most often (two behaviors out of three) with differences in the caretaker reporting the BP was the type of dog, with *galgos* being reported significantly more often as showing out-of-context fear of strangers and eating faeces. Hart et al. (2018) found that dog type had a significant effect on the likelihood of being reported as coprophagic. In particular, according to the American Kennel Club classification, dogs classified as hounds, such as *galgos*, had a higher risk to be reported as eating faeces than other types of dogs. The high prevalence of out-of-context fear of strangers in rescue *galgos*, with more than one out of four dogs reported as showing it, could be important information for associations rehoming these dogs, in order to be able to better prepare perspective adopters.

A surprising finding is the increased likelihood of dogs being reported as being afraid of loud noises, fireworks, thunderstorms, the longer the dog had been in the family. This result may be due to the fact that caretakers did not consider the problem when the rescue dog first arrived in the new family home: it is common that a rescue dog is fearful and in a state of heightened alert when he/she is introduced in a new family, because of both the sudden change of environment and his/her difficult history. If the behavior persisted long after the dog was adopted, the caretakers might have been more likely to report the behavior as relevant.

Overall, these findings may contribute to increase the knowledge about the challenges experienced during the adoption of different types of dogs. Data collected facilitate the possibility to plan targeted individualised interventions in order to better prepare families for adoption assisting them in developing the skills and insight needed to recognise and to mitigate any behavioral problems.

Conclusions

As problem behaviors can be an important factor to determine the likelihood of dog relinquishment and the return rate of adopted dogs (Protopopova & Gunter, 2017), it is important to increase the knowledge available on the behavior of dogs after rehoming. The result of the present volunteer based online survey showed that "Inadequate behavior when on the leash", "Out of context fear of loud noises, fireworks, thunderstorms", "Out of context fear of non-co-habiting adult people", "Poor recall", "Predatory behavior toward cats", "Predatory behavior toward other animals" and "Shadowing the caretaker" were the most common behavioral problems, reported in more than one rescue dog out of five in the study sample, with some differences ~~due to~~ between ~~the~~ types of rescue dog. These findings may contribute to increase the knowledge about the challenges experienced during the adoption of different types of dogs, and, thus, to the possibility to have tailored intervention plans in order to mitigate them, to safeguard both the dog's and the human family's welfare (Barcelos et al., 2024) and to protect and nurture the human-dog bond.

Acknowledgements

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Prevalenza di alcuni problemi comportamentali in due gruppi di cani di canile: *galgos* dalla Spagna e altri cani

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Sintesi

I problemi comportamentali sono spesso la causa di abbandono degli animali e fallimento delle adozioni. Abbiamo analizzato la prevalenza di alcuni possibili problemi comportamentali in *galgos* salvati in Spagna e in altri cani adottati utilizzando un questionario online dedicato. Sono state analizzate le risposte di un totale di 410 cani (198 *galgos*, 212 altri cani). "Paura che appare ingiustificata di rumori forti, fuochi d'artificio, temporali", "Non tornare al richiamo", "Comportamento predatorio verso i gatti", "Comportamento predatorio verso altri animali" e "Seguire continuamente il caretaker in casa" sono stati segnalati in più di un cane su cinque sia per i *galgos* che per gli altri cani. Le espressioni "Mangiare feci" e "Paura che appare ingiustificata di persone adulte non conviventi" sono state segnalate in più di un cane su cinque per i *galgos*, ma non per gli altri cani. "Richieste eccessive di attenzione" e "Comportamento inadeguato al guinzaglio" sono stati segnalati in più di un cane su cinque negli altri cani, ma non nei *galgos*. I *galgos* sono stati segnalati più spesso mostrare "Mangiare feci" (p= 0,002) e "Paura che appare ingiustificata di persone adulte non conviventi" (p= 0,009), mentre i cani che erano stati più a lungo in famiglia (cioè con una durata di adozione maggiore) sono stati segnalati più spesso come timorosi di rumori forti, temporali e fuochi d'artificio. Questi risultati possono contribuire ad aumentare le conoscenze sulle sfide che si incontrano durante l'adozione di diversi tipi di cani e, quindi, a facilitare interventi mirati e personalizzati per attenuarle.