

Exploring the influence of size on undesired behaviors of domestic dogs

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Abstract: The aim of this study was to evaluate the effects of the size of the dog on the expression of undesirable behaviors. Data obtained by 1156 anonymous questionnaires filled in by dog owners were statistically analyzed using the Kruskal Wallis test ($p < 0.05$) and the Mann Whitney test ($p < 0.05$). It emerged that small dogs more frequently displayed the following behaviors: house soiling, exaggerated jumping-up on owners when they come back, not obeying commands, chewing people's body parts, licking insistently the mouth and other parts of owners' body, barking when left alone, barking insistently (when not alone), tail chasing, mounting and humping, barking at other dogs, attempting to bite other dogs, growling at other dogs, fearing veterinarians/veterinary clinics, disliking when people (especially strangers) enter their territory, and defending one or more objects considered as their own.

Large dogs showed more frequently the following behaviors: jumping-up on other people, digging holes, chewing objects and people's body parts, chasing vehicles/bicycles/people, eating their own feces, destroying objects when left alone, pulling on the leash, tail chasing, chasing cats, attempting to bite other dogs, bristling when meeting other dogs.

The owner's behavior is regarded to be a possible cause of undesirable behaviors in dogs. Based on these results, veterinary behaviorists should emphasize the importance of knowing basic ethology and of the intraspecific socialization, especially with owners of small dogs.

Key Words: dog, undesirable behavior, size, breed.

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Introduction

Selection of dog breeds for a particular function has progressively become less important and the behaviors for which the dogs were once selected are today viewed as problematic in a family context (Notari & Goodwin, 2004). In fact, even when not selected for an ability, breeds maintain certain features and behaviors for many generations: for example, the Labrador Retriever is predisposed to retrieve and many Terriers are predisposed to kill small animals (Stafford, 2006).

In the USA, about 50% of dogs are purebred (Overall, 1997) and the breeders, who breed animals for show characteristics, select for a temperament which is meant to represent the breed. A few years ago, Karen Overall (1997) suggested this selection may actually tend to produce, over generations, greater numbers of aggressive dogs.

The existence of breed-specific behavior has been demonstrated by Scott & Fuller (1965) and has been categorized in relation to different breeds by Hart & Hart (1985) and Bradshaw et al. (1996), in the USA and UK, respectively. In the UK, breeds were categorized on the basis of aggression, reactivity and immaturity, while the American study categorized breeds also on the basis of trainability but not immaturity.

In 1980s in the USA five of the 10 most popular canine breeds were small dogs. In general, their aggression (territorial, dominance, watchdog behavior, towards other dogs) was average; reactivity

(excessive barking, excitability, demand for attention) high, and immaturity (playfulness, destructiveness) low. High reactivity might be considered unsuited to urban contexts but it appears to be accepted by many owners, at least in a small dog. In contrast in the UK, in the 1990s, the top breeds were mostly large (Bradshaw et al., 1996). The German Shepherd dog and the Cocker Spaniel are categorized as highly aggressive and the number of these two breeds is in decline (Bradshaw et al., 1996).

Bradshaw et al. (1996) identified 11 breeds in the UK which were categorized as highly aggressive. Interestingly these breeds have, except for the German Shepherd dog and the Corgis, maintained their popularity. Toy breeds with high reactivity (excessive barking, excitability, high demand for affection) but average or low aggression and low immaturity have decline in the UK. Seven of the top 10 breeds in the USA are in decline in UK, which suggests that generalizations as to what different societies require in their companion animals cannot easily be made.

In surveys, most dog owners reported that their dog engaged in some types of unacceptable behavior. In suburban Melbourne, Australia, 65% of owners stated that their dog had a behavioral problem (Kobelt, 2004), and in the USA 87% of dog-owning veterinary clients claimed the same (Campbell, 1986). Beaver (1994) reviewed the literature on complaints by owners about canine behavior. Results indicated that the most frequent problem was aggression, followed by barking, chewing and digging. The common forms of aggression were identified as territorial and protection of the owner. When clinical cases were reviewed, the major problem remained aggression, but the aggression was mainly dominance and fear-biting aggression. Behavioral problems are significant regarding the welfare of dogs: they may impact on the physical and/or psychological well-being of the animal, cause the human-dog relationship to deteriorate, increase the likelihood of the dog being abused or killed and make it more difficult for the dog's owner and the owners of the other dogs to exercise their dogs off the leash.

The aim of this study was to evaluate the effects of the size of the dog (small, medium and large) on the expression of undesirable behavior.

Materials and methods

The present study was carried out using a questionnaire that was manually administered to owners of dogs, selected through various channels (breeding kennels, purebred dog exhibitions, canine centers and veterinary practices). A total of 1,156 questionnaires, completed anonymously, were analyzed.

The questionnaire was divided into three sections:

The first section had to be filled in providing personal information (age, gender, education and current profession).

The second section looked at information regarding the dog (age, gender, possible neutering, breed, size, type of activity and the owner's reason for adopting the dog).

The third section focused on the dog's behavior: 43 types of behavior, considered problematic and/or undesired, were listed (Table 1). For each behavior, the owner was asked to indicate the frequency of display by their dog (often, sometimes, never).

The frequency with which, according to the owners, the problematic and/or undesired behaviors occurred were then transformed into scores (often=3; sometimes=2; never=1). The scores were compared using a non-parametric statistical analysis, first with the Kruskal Wallis ($p<0.05$) test, taking into consideration the three sizes, and, in case it resulted statistically significant, a second analysis with the Mann Whitney ($p<0.05$) test was performed, for comparisons between two sizes at a time.

Table 1. Undesired behaviors of dogs.

Behaviors	Behaviors
1. Urination in the house	23. Pulling on the leash
2. Marking the house with urine	24. Licking their own body insistently
3. Defecation in the house	25. Becoming fixated with an object
4. Exaggerated jumping-up on owners when they come back	26. Following shadows
5. Jumping-up on owners (not when they come back)	27. Going around in circles
6. Jumping-up on other people	28. Tail chasing
7. Digging holes	29. Insistently repeating an action
8. Running away from home	30. Mounting and humping
9. Not obeying commands (sit, lie down, wait)	31. Being very agitated and excitable
10. Not coming when called	32. Chasing cats
11. Chewing objects	33. Barking at other dogs
12. Chewing people's body parts	34. Attempting to bite other dogs
13. Insistently licking the owners' mouth	35. Raising its fur when meeting another dog
14. Insistently licking other parts of owners' body	36. Growling at other dogs
15. Chasing vehicles/bicycles/people	37. Acting aggressively when someone puts their hand of the dog's head
16. Eating something off the road	38. Acting aggressively when forced to do something it doesn't want to do
17. Eating their own feces	39. Acting aggressively when shouted at
18. Eating other dog's feces	40. Not wanting to be stroked
19. Barking when left alone	41. Fearing veterinarians/veterinary clinics
20. Destroying objects when left alone	42. Disliking it when people (especially strangers) enter their territory
21. Barking insistently (when not alone)	43. Defending one or more object (toys, bowl) considered as their own
22. Destroying (when not alone)	

Results

More than half (65.9%) of the total number of dog owners were female, with an average age of 36.6 ± 14.4 years. About the interviewed people, 63.3% of them had a secondary school education, while 14.4% attended lower-secondary school and only 17.7% had a university degree.

In the analyzed sample, 52.9% of the dogs were male (47.7% entire), 47.1% were female, (19.6% neutered).

For that concerns the age of the dogs, 22.8% of them were between 10 and 24 months (young), 49% between 25 and 84 months (adult), 19.8% between 85 and 143 months (senior) and the remaining 8.3% were older than 144 months (geriatric).

Regarding breed, purebred dogs composed the largest category ($n=735$; 63.6%), while mixed-breed dogs amounted to 36.4% ($n=421$) of the total. Of the purebred, 8.7% are German Shepherds, 8.7% Dachshunds, 6.6% Border Collies, 6.3% Golden retrievers, 5.6% Labrador Retrievers, 5.2% Boxers, 4.8% Miniature Poodles, 3.8% Beagles, 3.6% Jack Russells, 3.5% Cocker Spaniels, 3.5% Epagneul Bretons and 3.1% were Yorkshire Terriers.

With regard to the size, 32.4% of the dogs were small (< 10 Kg), 29.4% medium (11-20 Kg), while 38.2 % were large (21-40 Kg).

In table 2 are reported the results of the statistical analysis carried out comparing the three sizes (small, medium, large) in relation to the undesired behaviors listed.

Table 2. Results of the statistical analysis carried out comparing the three sizes (small, medium, large) in relation to the undesired behaviors listed.

Behaviors	χ^2	P
Urination in the house	45.55	< 0.001
Marking the house with urine	73.03	< 0.001
Defecation in the house	43.54	< 0.001
Exaggerated jumping-up on owners when they come back	9.39	0.009
Jumping-up on owners (not when they come back)	0.177	0.91
Jumping-up on other people	12.43	0.002
Digging holes	18.49	< 0.001
Running away from home	0.35	0.84
Not obeying commands (sit, lie down, wait)	21.27	< 0.001
Not coming when called	4.14	0.13
Chewing objects	6.93	0.03
Chewing people's body parts	10.47	0.005
Insistently licking the owners' mouth	34.95	< 0.001
Insistently licking other parts of owners' body	33.98	< 0.001
Chasing vehicles/bicycles/people	4.83	0.089
Eating something off the road	3.69	0.16
Eating their own feces	8.87	0.012
Eating other dog's feces	1.34	0.51
Barking when left alone	16.12	< 0.001
Destroying objects when left alone	13.09	0.001
Barking insistently (when not alone)	15.48	< 0.001
Destroying (when not alone)	1.86	0.39
Pulling on the leash	6.99	0.03
Licking their own body insistently	3.37	0.18
Becoming fixated with an object	3.61	0.16
Following shadows	1.73	0.42
Going around in circles	0.36	0.83
Tail chasing	7.27	0.026
Insistently repeating an action	2.23	0.329
Mounting and humping	18.8	< 0.001
Being very agitated and excitable	1.74	0.43
Chasing cats	18.19	< 0.001
Barking at other dogs	10.44	0.005
Attempting to bite other dogs	5.78	0.055

Behaviors	χ^2	p
Raising its fur when meeting another dog	19.87	< 0.001
Growling at other dogs	4.94	0.085
Acting aggressively when someone puts their hand of the dog's head	1.37	0.503
Acting aggressively when forced to do something it doesn't want to do	4.41	0.11
Acting aggressively when shouted at	2.39	0.303
Not wanting to be stroked	4.48	0.11
Fearing veterinarians/veterinary clinics	9.84	0.007
Disliking people (especially strangers) entering their territory	7.02	0.03
Defending one or more object (toys, bowl) considered as their own	8.84	0.012

Applying the Mann Whitney test to the significant data obtained with Kruskal Wallis test, other interesting information about the dog behavior, of different sizes, are gained. In table 3 are showed the levels of statistical significance obtained comparing the frequency of the observed behaviors in dogs of all sizes.

The dogs of small size were reported by their owners to show more undesired behaviors than dog of medium and large size.

Table 3. Results of the statistical analysis comparing undesired behaviors in relation to size (small vs medium, small vs large and medium vs large).

	Small vs medium	Small vs large	Medium vs large
Urination in the house	S > M U= 555.26; p<0.001	S > L U=67652.5; p<0.001	M > L U= 70731; p= 0.022
Marking the house with urine	S > M U= 49542.5; p<0.001	S > L U= 64142; p<0.001	n.s.
Defecation in the house	S > M U= 55837.5; p<0.001	S > L U= 69295; p<0.001	n.s.
Exaggerated jumping-up on owners when they come back	S > M U= 57402.5; p= 0.013	S > L U= 73934.5; P= 0.005	n.s.
Jumping-up on other people	n.s.	L > S U= 71904.5; P= 0.001	L > M U= 67977; p= 0.027
Digging holes	M > S U= 55192; p=0.001	L > S U= 69481; p<0.001	n.s.
Not obeying commands (sit, lie down, wait)	S > M U= 56375; p= 0.005	S > L U= 68510.5; p<0.001	n.s.
Chewing objects	n.s.	L > S U= 80479 p= 0.03	L > M U= 68015; p= 0.021
Chewing people's body parts	S > M U= 58841; p= 0.018	n.s.	L > M U= 67587.5; p= 0.001
Insistently licking the owners' mouth	S > M U= 53530; p<0.001	S > L U= 67212; p<0.001	n.s.
Insistently licking other parts of owners' body	S > M U= 50526; p<0.001	S > L U= 68019; p<0.001	n.s.
Chasing vehicles/bicycles/people	n.s.	n.s.	L > M U= 69285; p= 0.028

	Small vs medium	Small vs large	Medium vs large
Eating their own feces	n.s.	L > S U= 76968; p=0.003	n.s.
Barking when left alone	n.s.	S > L U= 70326.5; p<0.001	L > M U= 68419; p= 0.017
Destroying objects when left alone	n.s.	L > S U= 72147; p<0.001	n.s.
Barking insistently (when not alone)	S > M U= 57647.5; p= 0.026	S > L U= 70266; p<0.001	n.s.
Pulling on the leash	M > S U= 57628 p= 0.021	L > S U= 75321; p= 0.023	n.s.
Tail chasing	n.s.	n.s.	L > M U= 68410.5; p= 0.009
Mounting and humping	S > M U= 56364; p<0.004	S > L U= 69795; p<0.001	n.s.
Chasing cats	n.s.	L > S U= 72871; p=0.002	L > M U=63052; p<0.001
Barking at other dogs	S > M U= 55232; p= 0.001	n.s.	n.s.
Attempting to bite other dogs	S > M U= 58808; p= 0.041	n.s.	L > M U= 69110; p= 0.028
Raising its fur when meeting another dog	n.s.	L > S U= 71882; p=0.001	L > M U= 63453.5; p<0.001
Growling at other dogs	S > M U= 58088.5; p= 0.035	n.s.	n.s.
Fearing veterinarians/veterinary clinics	S > M U= 57584.5; p=0.029	S > L U= 72888.5; p= 0.002	n.s.
Disliking people (especially strangers) entering their territory	n.s.	S > L U= 747471; p= 0.01	n.s.
Defending one or more object (toys, bowl) considered as their own	S > M U= 58266; p= 0.032	S > L U= 73726; p= 0.004	n.s.

Discussion

The results of this research highlight numerous differences in the occurrences of undesired behavior among the three groups of dogs being considered: small, medium and large dogs. Some of these behaviors can have a common cause and will be discussed further.

The present research shows that house soiling is more frequent in small size dogs than in medium and large size dogs, as previously reported in various studies (Haupt, 2009; Overall, 2013), regarding both urination in large and small quantities, and defecation. Some authors have suggested that some breeds display these behaviors more than others e.g. Beagles and Bichon Frises (Campbell, 1972; Bamberg & Haupt, 1991-2001). The cause of such behaviors could be an incorrect management of small dogs, that very often are taken out much less than larger dogs (Westgarth et al., 2015). Indeed, small size dogs have a relatively much faster metabolism than larger dogs, and this, together with a smaller bladder, means these dogs need to be taken out more frequently (Overall, 2013).

Inappropriate elimination can also be the consequence of poor or wrong training. Overall (2013)

indicates some of these factors: literature shows that some breeds (e.g. Yorkshire Terriers) have difficulty in learning how to eliminate correctly and because of this many owners do not provide enough training; also, cleaning up after a small dog is easier than cleaning up after a larger one, and if the quantity of urine is very small the owner might even not notice, especially if it has dried, in which case the dog will continue to urinate in the same spot.

Often owners do not teach their dogs to eliminate outside at the right time preferring to use newspapers and dog pads: not having access to an appropriate area, dogs will use another one and will learn to prefer this one (Overall, 2013). Not only these dogs do not learn how to wait to be taken outside, they also get used to preferring the spot chosen inside the house, and this will make it even more difficult to correct this behavior in the future (Houpt, 2009).

Another possible cause is based on the hypothesis that small dogs are not given a bigger enough space for evacuation, a space that should be proportionate to size; for this reason, they are forced to evacuate within the two meter area of their resting place (Houpt, 2009). Some dogs, finally, learn to associate evacuation with the end of their walk, and tend not to evacuate during the walk, in order to prolong it, evacuating in the house (Houpt, 2009). It would also be interesting to look at the behavior of these dogs during their walks, because if they show signs of social stress, such as anxiety or fear, it might be that they are not able to relax to correctly evacuate outside, and are waiting to do it in the home. It might also be that these dogs intentionally abstain from marking and leaving traces outside.

Finally, it seems that hunting dogs have difficulty learning to evacuate outside because during their walk they are distracted or become fixated with a smell (Overall, 2013).

Another difference that emerged concerns the way some dogs become excessively excited when the owner returns home, something that tends to be more characteristic of small dogs. According to Beaver (2009), this behavior is very common in a dog seeking the attention of the owner. Jumping up on people is a very frequent behavioral problem although it is taken less seriously, and the smaller the dog the less the behavior is seen as problematic (Houpt, 2003). This behavior can be understood as a request for attention, that becomes excessive if the owner perceives it as such (Bowen, 2004); insistent barking, and repeated licking of the mouth and other parts of the owner's body (also more frequent in small size dogs), can similarly be a sign of an excessive request for attention. Studies by Hart and Hart (1985), Bradshaw et. al. (1996) confirm these results and claim that with small dogs the occurrence of excessive barking, excitability, request for attention, are more frequent. However, insistently licking might also indicate a more serious issue, such as problems with digestion, with hierarchy or with separation (Bowen, 2004). Finally, exaggerated licking may also be a nonaggressive way of distancing people.

Too much excitement when the owner returns home may also be indicative of separation anxiety (Borchelt & Voith, 1982; Voith, 1985), especially if associated with other undesired behaviors such as inappropriate evacuation, destructivity and vocalization (Pageat, 1999).

The present study finds that various behaviors linked to separation anxiety, such as barking when left alone, are more frequent with small and medium size dogs. A study by Soares et al. (2012) shows that most owners do not believe that these behaviors might be the result of their attitude towards the dog.

Also chewing on parts of people's bodies may indicate an excessive request for attention (Bowen, 2004); this behavior was found to be frequent in both small and large size dogs. The fact that this behavior occurs also with large dogs may be explained if we look at the breeds being considered as representative of large size dogs. In fact, both Retrievers and Boxers are well-known for the excessive use of their mouths.

The present study also shows that small size dogs obey less to commands than medium and large size dogs. This might be due to the way owners relate to these dogs (Lindell, 2004; Arhant et al., 2010; Bassi et al, 2016): being small, these dogs are often allowed to display any kind of behaviors, and this may result in the dogs not obeying even to the simplest commands.

Mounting and humping were found to be more frequent in small size dogs. This behavior is normal for a dog and is not necessarily associated with dominance or sexual behavior (Overall, 2013). It is present in male dogs, entire or neutered, and in female dogs, entire or spayed. Provided the miming of the sexual act does not occur during a fight, in which case it has a different meaning, this act may refer to attachment, indicating the dog's wish to be together, or may be used to seek attention or to manipulate a person; dogs can behave this way when they are very happy and particularly excited and want a person to interact with them (Overall, 2013). The same reaction might be also indicative of too much stress or anxiety. This is typical of crowded places, it may be triggered by the arrival of new animals or children, and in general it may occur in any type of stressful situation for the dog. Mounting can also be associated with a compulsive disorder (Landersberg et al., 2103). These explanations seem to be confirmed by the fact that this behavior is more frequent in small dogs, a category in which excessive requests for attention and social stress are more common.

Small dogs are also more frequently afraid of the veterinarian clinic. According to Marcella (1983) all breeds may show signs of aggression towards the veterinarian, because fear is often linked to negative experiences associated with veterinarians. It is therefore possible to hypothesize that breeds predisposed to suffer from certain conditions and that must undergo painful manipulations, develop a fear of the veterinarian and/or of the clinic where the veterinary surgeons operate. Furthermore, small dogs are often handled less kindly than larger dogs, and this may lead to an increase of stress and anxiety.

Small dogs are less tolerant to people, especially strangers, entering their territory and tend to be more protective of the objects (e.g. toys, feeding bowl) they consider belonging to them. This behavior may occur in the house, in the car, but also outside: in all these cases aggressiveness increases with the decreasing of distance (Overall, 2013). Unlike aggression caused by fear, which often manifests itself at a young age, territorial aggression generally appears at six months of age or later, when a dog has achieved social maturity (Haug, 2008). Territorial aggression is associated with guard dog breeds such as the German Shepherd, Rottweilers, Chow Chows, though this is a generalization because individuals of a same breed can be very different one from another. The way the dog is treated at home, its general management and training, can play an important role about this trait: dogs that have not correctly socialized during the first period of socialization (approximatively between three and 14 weeks) might become more fearful and aggressive when strangers come into their territories (Bain, 2009). The results of the present research are in line with this: it has, in fact, already been stressed that with small size dogs, socialization is often insufficient, attention to training is less and more behaviors, considered unacceptable, are tolerated, by comparison with larger dogs.

Small size dogs are also found to be more predisposed to aggressive behavior towards other dogs, (barking, growling and trying to bite other dogs). The tendency to bark can vary a lot depending on breeds and this is indicative of the effects of selection on the part of man, for or against, which also affects the limit beyond which a dog reacts (Gallicchio, 2001).

Jumping up on people is found to be more frequent in large dogs. This behavior is normal for a dog, it is a way of demanding attention and an invitation to play (Lindell, 2004). However, it is not always tolerated, especially if the dog is a big one. The results of the research may indeed have been influenced by the fact that a large dog jumping up on a person is perceived in a different way with comparison to small dogs, because large dogs may frighten a person more and dirty him/her. Often with small dogs this behavior is not only tolerated but even encouraged. The behavior may also be connected to the feeling of being threatened and to social stress, especially if the dog attempts to reach the face of the person. Furthermore, a large dog is not only aware of its size, but often gets what it wants by behaving this way, and consequently such a behavior is reinforced.

Digging holes is a common problematic behavior: many dogs like digging, and often do it fervently. Digging may include raking or scratching a surface before sniffing or eating something, or before urinating or defecating, after which a dog walks in circles around the spot and then lies

down (Overall, 2013); this behavior may also be linked to stress. The reasons for digging are many: a dog may want to vaporize a pre-existing smell, leave its own smell, look for an animal or object it has smelled, unearth something to eat; dogs may dig out of curiosity, maybe when nobody is paying attention, or to find a fresh and humid spot when the dog is hot, or on the contrary to find shelter when the dog is cold (Overall, 2013). The present research finds that this behavior is more common in large and medium size dogs and may be caused by the fact that these types of dogs (especially working dog breeds) need more physical exercise (Beaver, 2009). According to Overall (2013), however, some breeds like digging more: Jack Russells for instance, and terriers in general, tend to behave this way more frequently because their breed has been selected to carry out this type of search. This idea is not confirmed by our findings, indicating small dogs less prone to digging. This discrepancy might be explained considering that, among the small size dog breeds, only two breeds are terriers.

Chewing objects is more frequent in large dogs. Dogs use their mouth to explore and investigate, starting in the socializing phase, at about three weeks of age (Fox, 1965; Houpt, 1991). For young and active dogs, that do not get enough, chewing objects may be a form of play or of exploration (Simpson, 2000); also, this behavior may be territorial, localized around doors and windows (Landsberg et al., 2103). Chewing is also probably linked to a lack of stimuli in the environment, especially in the case of large dogs that do not get enough physical exercise (Houpt, 2003). Beaver (2009) claims that exaggerated chewing is typical of dogs with very high levels of energy.

Destroying objects when left alone is more frequent in large dogs and may be a sign of separation anxiety, or, in many cases, a response to fear, especially if the behavior occurs only when the owner is absent (Houpt, 2009). It may also occur as a manifestation of a phobic state, for instance when a dog reacts to loud noises or thunder (Horwitz, 2004). These results are in line with what is reported by Hart & Hart (1985) and Bradshaw et al. (1996) who claim destructivity in small dogs is low. Large dogs have a stronger propensity to chase vehicles/bicycles/people and cats. This behavior represents a serious risk both for the dogs and the owners (Beaver, 2009). It is linked to the prey instinct, that drives dogs to chase objects and/or people in movement (Beaver, 1982; 1994). Chasing vehicles/bicycles/people is also a way of relieving stress: in line with what described by Bowen (2004), this behavior is typical of many shepherd dogs, that use a predatory pattern to lower stress levels.

Dogs that eat their own feces are more often large animals. Dogs that have been punished too severely and in the wrong way for having evacuated inappropriately may develop a way to avoid the pain and anxiety they have associated with evacuation. Some dogs eat the feces they have just evacuated (Overall, 2013), while in other dogs this behavior is the manifestation of an eating disorder. It is possible to hypothesize that larger dogs are more prone to behave this way because they are often punished more severely compared to smaller dogs.

Medium and large size dogs pull on the leash more than small dogs. This finding may depend on the perception of the owner; in fact, a small dog will certainly pull on the leash with much less strength than a larger one. Also, a large dog often obtains what it wants by pulling, and the behavior is thus reinforced by this success and will tend to repeat itself. Pulling on the leash may also be an indication of stress.

Tail chasing is a locomotor compulsive disorder. Compulsive disorders are repetitive and persistent actions that bring no benefit, that occur out of context and interfere with normal behavior (Mentzel, 2015). They may arise in situations of conflict or frustration, when the dog has no control strategy to relate to the situation effectively (Landsberg, 2013). The result may be a substitution of behavior when the response to a stimulus or to a situation is inappropriate or out of context (e.g. going around in circles, tale chasing) or a behavior that is redirected when the dog substitutes targets (e.g. redirected aggression, marking with urine) (Landsberg, 2013). This study shows that tale chasing is more common in small and medium size dogs. A study by Overall and Dunham (2001) finds that tail chasing is more common in German shepherds, something that is confirmed also by

this research. There are no statistically relevant differences among sizes for what concerns other investigated stereotyped behaviors, although it seems possible to associate particular breeds to particular behaviors: Doberman pinschers tend to lick their side more, Bull terriers seem to prefer circulatory movements and German shepherds are prone to tail chasing (Hartigan, 2000).

Conclusions

In conclusion, the findings of this study suggest that size in domestic dogs is related to a higher occurrence of some undesired behaviors. In particular, it confirms that owners of small dogs perceived their pets as less obedient, more aggressive, anxious and fearful compared to owners of medium and large size dogs. Small dogs seem to display the majority of investigated undesired behaviors more frequently, compared to other sizes, especially the ones linked to social stress, separation anxiety and attention seeking.

The cause of these behaviors might be due, in part, in a predisposition of some small breeds but a major role is likely to be played by the management of small dogs, which is often incorrect.

The owners' behavior is indeed to be considered as a possible cause of behaviors such as disobedience or excessive excitability in small dogs. Owners may increase obedience by improving their interaction and by playing more with their dogs; also, they should handle these dogs kindlier.

Veterinary behaviorist should emphasize the importance both dog's normal behavior and of intraspecific socialization, especially with owners of small dogs.

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Valutazione dell'influenza della taglia sulla manifestazione dei comportamenti indesiderati nel cane domestico

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Sintesi

Lo scopo di questa ricerca è stato quello di valutare l'influenza della taglia (piccola, media e grande) sulla manifestazione dei comportamenti indesiderati nel cane domestico. I dati ottenuti tramite 1156 questionari anonimi compilati dai proprietari sono stati analizzati statisticamente mediante il test di Kruskal Wallis ($p < 0,05$) e il test di Mann Whitney ($p < 0,05$). È emerso che i cani di piccola taglia esibiscono con maggior frequenza i seguenti comportamenti: defecare, urinare e marcare in casa, fare troppe feste al rientro dei proprietari, non obbedire ai comandi, mordicchiare parti del corpo delle persone, leccare insistentemente la bocca e altre parti del corpo del proprietario, abbaiare se lasciato solo, abbaiare insistentemente (non da solo), inseguirsi la coda, mimare l'atto sessuale, abbaiare ad altri cani, tentare di mordere altri cani, ringhiare contro altri cani, mostrare paura del veterinario/ambulatorio veterinario, non gradire l'entrata di persone, soprattutto estranei, nel suo territorio, difendere uno o più oggetti che considera suoi. I cani di taglia grande manifestano maggiormente i seguenti comportamenti: saltare addosso ad altre persone, scavare buche, mordicchiare oggetti e parti del corpo delle persone, inseguire veicoli/biciclette/persone, mangiare le proprie feci, distruggere oggetti se lasciato solo, tirare al guinzaglio, inseguirsi la coda, correre dietro ai gatti, tentare di mordere altri cani, rizzare il pelo quando incontra altri cani. Il comportamento dei proprietari è considerato come una possibile causa della manifestazione dei comportamenti indesiderati nel cane. In base a questi risultati, i veterinari comportamentalisti dovrebbero enfatizzare l'importanza sia dell'etogramma del cane, sia della socializzazione intraspecifica, soprattutto con i proprietari di cani di taglia piccola.