

Effects of physical activity on dog behavior

Marcella Zilocchi^{1,*}, Zalea Tagliavini², Elisa Cianni², Angelo Gazzano¹

¹ *Department of Veterinary Science - University of Pisa*

² *Dog trainer freelance*

Abstract: In order to investigate the effects of physical activity on dog behavior, a questionnaire divided into 4 sections was used. Based on the 234 questionnaires collected, it was possible to create two groups: active dogs group (AD) made up of 94 subjects who performed a sport and a group of 140 sedentary dogs (SD). Compared to the SD group, dogs in the AD group showed significantly more behaviors like: “Chasing vehicles and persons” and “Staring an object” but fewer behaviors like: “Turning on itself” and “Mounting”. These behaviors are sometimes indicators of a state of stress that can be caused by frustration. Physical activity, especially if carried out through sports, requires that the animal develops a remarkable ability to cope with frustration and to maintain the self-control. This could be the reason why these behaviors are less expressed by dogs belonging to the AD group. This effect is even greater in dogs that practice agility compared to other subjects of the sample, probably also because of the use of positive reinforcement during training for this sport. Dogs that practice agility show, with a statistically significant frequency, a lower tendency to be aggressive towards other dogs. A possible explanation may lie in the better intra-specific socialization to which these animals are subjected, having frequent contact with other dogs during sporting events.

A difference between the AD and SD group also exists for the other two behaviors: “Chasing vehicles/bicycles/persons” and “Staring an object” which are expressed more in the AD group. We cannot exclude that these results may be caused by the high number of Border Collies that are present in the sample. In conclusion, these preliminary data seem to suggest a possible influence of physical activity on dog behavior, with positive effect about some undesirable behaviors that are less expressed. Special attention should be paid to those behaviors that the selection often magnified for utilitarian purposes, because the dog was used for particular tasks.

Key Words: physical activity; dog; behavioral problems.

* *Corresponding Author:* zilocchi@vet.unipi.it

Introduction

The most common reason for owning a dog in the Western world is companionship (Bennett et al., 2007; Staats et al., 2008). This intense relationship is sometimes put at risk by the onset of unwanted behaviors in dogs. Behaviors that owners find problematic are widespread in the domestic dog population (Wells & Hepper, 2000; Bradshaw et al., 2002; Kobelt et al., 2003; Hiby et al., 2004) and can become a common cause of dogs being abandoned and sent to the shelters (Miller et al., 1996; Serpell, 1996; Marston & Bennett, 2003; Shore et al., 2003; Shore, 2005). It has been estimated that up to 90% of dogs may exhibit behaviors that their owners find unacceptable (Vacalopoulos & Anderson, 1993). So-called ‘behavior problems’ can be a huge source of distress for owners and for many the only solution seems to lie in handing the animal over to the care of a rescue shelter (e.g. Patronek et al., 1995; Salman et al., 1998). Over 30% of dogs relinquished by their owners to rescue shelters are abandoned because of behavior problems (Wells, 1992).

Although genetic factors clearly predispose individual dogs to develop particular behavioral phenotypes (Overall et al., 2006), environmental factors also can have a profound effect (Appleby et al., 2002).

Previous studies have reported an association between reduced prevalence of undesirable behaviors in pet dogs and attendance at obedience training classes (Clark & Boyer, 1993; Jagoe & Serpell, 1996) or engagement with any form of training (Kobelt et al., 2003; Bennett & Rohlf, 2007).

In addition, Hiby et al. (2004) found significantly fewer behavior problems in dogs that had been trained using rewards only, as compared with dogs that had been trained using some form of punishment only, or a combination of both.

Following on from the results of these previous studies, sport activity could have a positive effect in reducing the occurrence of undesirable behaviors in dogs. Thus, the aim of this research was to evaluate the effect of physical activity on dog behavior.

Material and methods

In order to investigate the effects of physical activity on dog behavior, a questionnaire divided into 4 sections was used. The first section of the questionnaire regarded the dog (sex, age, reproductive status, origin), the second the owner (sex, age, level of education, profession), a third section concerned the dog management (time spent outside, type of physical activity etc.) and in a final part, 44 multiple-choice questions about dog behavior and their frequency of display (often, sometimes or never) were asked.

The questionnaires were collected between the months of May 2014 and January 2015; all animals were, at the time of the survey, older than a year. Statistical analysis of the data was performed with the χ^2 test.

Based on the 234 questionnaires collected, it was possible to create two groups: active dogs group (AD) made up of 94 subjects who performed a sport such as agility (22.6%), the mobility (5.6%), the dog dance (2.1%), the obedience (10.1%), search and rescue (5.1%) or other activities and a group of 140 sedentary dogs (SD). In AD groups, 39 dogs were Border Collies, while in the SD group 14.

Table 1 shows characteristics of the subjects in both groups.

The statistical analysis did not reveal significant differences as regards the characteristics of the two groups which may constitute interfering factors for the research.

Table 1. Characteristics of the dogs belonging to the groups examined.

	Active dogs N = 94	Sedentary dogs N = 140
Dog mean age \pm S.D. (months)	46.11 \pm 33.86	62.57 \pm 44.31
Male /female dogs (n)	41/53	74/66
	$\chi^2 = 1.569$; p = 0.21	
Male dogs castrated (%)	8.5	8.6
Female dogs neutered (%)	31.9	28.6
Daily walks in working days (n)	Owner percentage	
Up to 3	57.4	52.9
More than 3	36	39.3
Never	6.4	7.1
	$\chi^2 = 0.344$; p = 0.84	
Lenght of daily walks	Owner percentage	
More than 1 hour	57.4	45
Less than 1 hour	42.6	55
	$\chi^2 = 3.005$; p = 0.08	
Time devolved to play with the dog	Owner percentage	
Never	2.12	3.57
Up to 1 hour	79.78	80
More than 1 hour	18.08	16.43
	$\chi^2 = 0.482$; p = 0.79	

Results

The percentages of dogs of two groups showing undesirable behaviors are reported in table 2. Compared to the SD group, dogs in the AD group showed significantly more behaviors like: “Chasing vehicles and persons” and “Staring an object” but fewer behaviors like: “Turning on itself” and “Mimicking sexual intercourse”.

Table 2. Percentages of dogs of two groups showing undesirable behaviors.

Questions	Often/ Sometimes		
	Active dogs	Sedentary dogs	$\chi^2; p$
Urinating indoors in large quantities	11,7%	17.1%	n.s.
Urinating in the house in small quantities	9.6%	15.7%	n.s.
Defecating in the house	8.5%	12.1%	n.s.
Making too many greetings to the owners when they return	75.5%	82.1%	n.s.
Jumping up to the owners (not on their return)	56.4%	58.6%	n.s.
Jumping up to other persons	48.9	49.3%	n.s.
Digging	50.0%	48.6%	n.s.
Escaping from home	10.6%	9.3%	n.s.
Not obeying the commands (sit, down, etc.)	51.1%	62.9%	n.s.
Not coming back when it is called	53.2%	57.9%	n.s.
Chewing objects	46.8%	51,4%	n.s.
Licking parts of people’s bodies	29.8%	20,7%	n.s.
Insistently licking the mouth of the owner	31.9%	34,3%	n.s.
Persistently licking other body parts of the owners	53.2%	50.0%	n.s.
Chasing vehicles / bicycles / persons	29.8%	18.6%	3.98; 0.046
Scavenging	40.4%	43.6%	n.s.
Eating their own feces	6.4%	10.7%	n.s.
Eating feces of other dogs	18.1%	22.9%	n.s.
Barking if left alone	33.0%	43-6%	n.s.
Destroying items if left alone	26.6%	31.4%	n.s.
Insistently barking (not alone)	38.3%	40.7%	n.s.
Destroying (not alone)	10.6%	15.0%	n.s.
Pulling on a leash	70.2%	72.1%	n.s.
Insistently licking him/herself	34.0%	42.9%	n.s.
Staring an object	37.2%	19.3%	9.30; 0.002
Shadow chasing	6.4%	12.9%	n.s.
Turning on itself	12.8%	27,9%	7.51; 0.006
Chasing his/her tail	16.0%	15.7%	n.s.
Repeating some action insistently	24.5%	20.7%	n.s.
Mounting	25.5%	40.7%	5.73; 0.017
Being very agitated and excitable	66.0%	64.3%	n.s.
Chasing cats	70.2%	57.9%	n.s.
Barking at other dogs	61.7%	70.0%	n.s.
Attempting to bite other dogs	21.3%	27.1%	n.s.
Piloerection when he meets other dogs	47.9%	49.3%	n.s.

Questions	Often/ Sometimes		
	Active dogs	Sedentary dogs	χ^2 ; p
Growling at other dogs	54.3%	51.4%	n.s.
Reacting aggressively when touched on the head	3.2%	6.4%	n.s.
Reacting aggressively when forced to do something he/she does not want	5.3%	6.4%	n.s.
Aggressive behavior when scolded	5.3%	11.4%	n.s.
Disliking to be stroked	18.1%	18.6%	n.s.
Showing fear of the veterinarian/veterinary clinic	54.3%	61.4%	n.s.
Defending his territory	33.0%	39.3%	n.s.
Defending one or more objects (e. g. toys, food bowl)	31.9%	40.7%	n.s.

The dogs of the AD group practicing agility show behavioral differences compared to the other subjects of the sample and the data are reported in Table 3. These animals have a greater tendency to exhibit “Staring an object” behavior but they show few behaviors such as “Turning on itself”, “Mounting” and “Attempting to bite other dogs”.

Table 3. Undesirable behaviors showed, with statistical significant difference, by dogs performing agility.

Questions	Often/ Sometimes		
	Agility dogs	Other dogs	χ^2 ; p
Staring an object	39.6%	22.6%	6.06; 0.04
Turning on itself	7.55%	25.97%	8.16; 0.04
Mimicking sexual intercourse	22.64%	38.12%	4.34; 0.037
Attempting to bite other dogs	13.2%	28.2%	4.93; 0.026

Discussion

Many companion dogs occupy a privileged position in our society, living closely with human caretakers while others are relinquished to shelters or abandoned, often because they exhibit undesirable behaviors. Potentially problematic behaviors fall into five factors: disobedience, unfriendliness/aggression, nervousness, anxiety/destructiveness and excitability. (Bennet & Rohlf, 2007).

The results of this research show that dogs performing physical activity exhibited, with a statistically lower frequency, undesirable behaviors like: “Turning on itself” and “Mounting”. These behaviors are sometimes indicators of a state of stress that can be caused by frustration (Mariti et al., 2012). Physical activity, especially if carried out through sports, requires that the animal develops a remarkable ability to cope with frustration and to maintain the self-control. This could be the reason why these behaviors are less expressed by dogs belonging to the AD group. This effect is even greater in dogs that practice agility compared to other subjects of the sample, probably also because of the use of positive reinforcement during training for this sport (Blackwell et al., 2008).

Moreover, dogs that practice agility show, with a statistically significant frequency, a lower tendency to be aggressive towards other dogs. A possible explanation may lie in the better intra-specific socialization to which these animals are subjected, having frequent contact with other dogs during sporting events.

A difference between the AD and SD group also exists for the other two behaviors: “Chasing vehicles/bicycles/persons” and “Staring an object” which are expressed more in the AD group. We cannot exclude that these results may be caused by the high number of Border Collies that are present in the sample. The Border Collie is in fact a breed that is typically selected to lead the flocks

and bring them to the desired location by the shepherd. This genetically selected behavior proves very useful in sporting disciplines because it allows the dog to maintain a great attention on the handler and it is intensely reinforced.

Also the behavior of chasing vehicles/ bicycles and persons is part of the special ethogram of the Border collie that, chasing the sheep must lead, proposes a behavior similar to the predatory behavior of the wolf. Probably this behavior has been not showed by dogs performing agility because this sport discipline requires an elevated level of training which allows controlling undesirable or even dangerous behavior such as chasing vehicles or people.

In conclusion, these preliminary data seem to suggest a possible influence of physical activity on dog behavior, with positive effect about some undesirable behaviors that are less expressed. Special attention should be paid to those behaviors that the selection often magnified for utilitarian purposes, because the dog was used for particular tasks.

A careful animal management, beginning in the puppyhood (Gazzano et al., 2008), should limit the expression of these behaviors that are considered undesirable by many owners.

References

- Appleby D., Bradshaw J.W.S., Casey R.A. Relationship between aggressive and avoidance behavior by dogs and their experience in the first six months of life. *Vet. Rec.* 2002; 150: 434-438.
- Bailey G. Parting with a pet survey. Blue Cross Publication, BlueCross, Burford, Oxon, U.K. 1992.
- Bennett P.C., Cooper N., Rohlf V.I., Mornement K. Factors influencing satisfaction with companion-dog-training facilities. *J. Appl. Anim. Welf. Sci.* 2007; 10: 217-241.
- Bennett P.C., Rohlf, V.I. Owner-companion dog interactions: relationships between demographic variables and potentially problematic behaviors, training engagement and shared activities. *Appl. Anim. Behav. Sci.* 2007; 102: 65-84.
- Blackwell E.J., Twells Caroline, Seawright A., Casey R.A. The relationship between training methods and the occurrence of behavior problems, as reported by owners, in a population of domestic dogs. *J. Vet. Behav. Clin. Appl. Res.* 2008; 3: 207-217.
- Bradshaw J.W.S., McPherson J.A., Casey R.A., Larter I.S. Aetiology of separation-related behavior in domestic dogs. *Vet. Rec.* 2002; 151: 43-46.
- Clark G.I., Boyer M.N. The effects of dog obedience training and behavioral counselling upon the human-canine relationship. *Appl. Anim. Behav. Sci.* 1993; 37: 147-159.
- Gazzano A., Mariti C., Alvares S., Cozzi A., Tognetti R., Sighieri C. The prevention of undesirable behaviors in dogs: effectiveness of veterinary behaviorists' advice given to puppy owners. *J. Vet. Behav. Clin. Appl. Res.* 2008; 3: 125-133.
- Hiby E.F., Rooney N.J., Bradshaw J.W.S. Dog training methods: their use, effectiveness and interaction with behavior and welfare. *Anim. Welf.* 2004; 13: 63-69.
- Jagoe A., Serpell J. Owner characteristics and interactions and the prevalence of canine behavior problems. *Appl. Anim. Behav. Sci.* 1996; 47: 31-42.
- Kobelt A.J., Hemsworth P. H., Barnett J.L., Coleman G.J. A survey of dog ownership in suburban Australia: conditions and behavior problems. *Appl. Anim. Behav. Sci.* 2003; 82: 137-148.
- Mariti C., Gazzano A., Lansdown Moore J., Baragli P., Chelli L., Sighieri C. Perception of dogs' stress by their owners. *J. Vet. Behav. Clin. Appl. Res.* 2012; 7: 213-219.
- Mariti C., Ricci E., Carlone B., Moore J.L., Sighieri C., Gazzano A. Dog attachment to man: A comparison between pet and working dogs. *J. Vet. Behav. Clin. Appl. Res.* 2013; 8: 135-145.
- Marston L.C., Bennett P.C. Reforging the bond towards successful canine adoption. *Appl. Anim. Behav. Sci.* 2003; 83: 227-245.
- Miller D.D., Staats S.R., Partlo C., Rada K. Factors associated with the decision to surrender a pet to an animal shelter. *J. Am. Vet. Med. Assoc.* 1996; 209: 738-742.
- Overall K.L., Hamilton S.P., Chang M.L. Understanding the genetic basis of canine anxiety: phenotyping dogs for behavioral, neurochemical and genetic assessment. *J. Vet. Behav. Clin. Appl. Res.* 2006; 1: 124-141.

- Patronek G.J., Glickman L.T., Moyer M.R. Population dynamics and the risk of euthanasia for dogs in an animal shelter. *Anthrozoos* 1995; 8: 31-43.
- Salman M.D., New J.G., Scarlett J.M., Kass P.H., Ruch-Gallie R., Hetts S. Human and animal factors related to the relinquishment of dogs and cats in 12 selected animal shelters in the United States. *J. Appl. Anim. Welf. Sci.* 1998; 1: 207-226.
- Serpell J.A. Evidence for an association between pet behavior and owner attachment levels. *Appl. Anim. Behav. Sci.* 1996; 47: 49-60.
- Shore E. R., Petersen C.L., Douglas D.K. Moving as a reason for pet relinquishment: a closer look. *J. Appl. Anim. Welf. Sci.* 2003; 6: 39-52.
- Shore E.R., Returning a recently adopted companion animal: adopters' reasons for and reactions to the failed adoption experience. *J. Appl. Anim. Welf. Sci.* 2005; 8: 187-198.
- Staats S., Wallace H., Anderson T. Reasons for companion animal guardianship (pet ownership) from two populations. *Soc. Anim.* 2008; 16: 279-291.
- Vacalopoulos A., Anderson R.K. Canine behaviour problems reported by clients in a study of veterinary hospitals. *Appl. Anim. Behav. Sci.* 1993; 37: 84.
- Wells D.L., Hepper P.G. The behaviour of dogs in a rescue shelter. *Anim. Welf.* 1992; 1: 171-186.
- Wells D.L., Hepper P.G. Prevalence of behaviour problems reported by owners of dogs purchased from an animal rescue shelter. *Appl. Anim. Behav. Sci.* 2000; 69: 55-65.

Effetto dell'attività fisica sul comportamento del cane

Marcella Zilocchi¹, Zalea Tagliavini², Elisa Cianni², Angelo Gazzano¹

¹ *Dipartimento di Scienze Veterinarie - Università di Pisa*

² *Istruttore cinofilo libero professionista*

Sintesi

Per valutare l'effetto dell'attività fisica sul comportamento del cane, è stato utilizzato un questionario suddiviso in 4 sezioni. Sulla base dei 234 questionari compilati, è stato possibile creare due gruppi: il gruppo dei cani fisicamente attivi (AD), costituito da 94 soggetti che praticavano un'attività sportiva ed un gruppo di cani sedentari (SD) comprendente 140 soggetti.

I cani del gruppo AD esibivano maggiormente, in modo statisticamente significativo, comportamenti come "Inseguire veicoli e persone" e "Fissare un oggetto". Erano invece meno espressi comportamenti come "Girare su se stesso" e "Mimare l'atto sessuale". Questi comportamenti possono essere, talvolta, indicatori di uno stato di stress causato dalla frustrazione. L'attività fisica, specialmente se effettuata attraverso lo sport, richiede che l'animale sviluppi una notevole abilità a gestire la frustrazione e a mantenere l'autocontrollo. Potrebbe essere questo il motivo per cui questi comportamenti sono meno espressi dai cani del gruppo AD. Questo effetto si manifesta in modo ancora più evidente nei cani che praticano agility, rispetto agli altri soggetti del campione, probabilmente anche a causa dell'utilizzo di rinforzi positivi durante il training per questo sport.

Inoltre i cani che praticano agility mostrano, in modo statisticamente significativo, una minor tendenza ad essere aggressivi verso altri cani. Una possibile spiegazione potrebbe risiedere nella miglior socializzazione intraspecifica a cui questi animali sono sottoposti, avendo frequenti contatti con altri cani durante gli eventi sportivi.

Per quanto riguarda i comportamenti: "Inseguire veicoli e persone" e "Fissare un oggetto", che sono maggiormente espressi dal gruppo AD, non possiamo escludere che questi risultati possano essere dovuti all'alto numero di Border Collie presenti nel campione.

In conclusione, questi risultati preliminari sembrano suggerire l'esistenza di una possibile influenza dell'attività fisica sul comportamento del cane, con un positivo effetto su alcuni comportamenti indesiderabili che sono meno espressi negli animali che praticano sport.

Un'attenzione particolare andrà posta nella gestione di quei comportamenti che la selezione ha ingigantito per ragioni di utilità, legate al particolare compito lavorativo che il cane svolgeva.