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FACTORS INFLUENCING OFF-LEASH DOG WALKING IN PUBLIC PLACES

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Abstract

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Little is known about factors that influence owners' decisions walking their dogs on or off a leash in public places. We examined the effect of the type of public place, dog's age, sex and size, and human gender on off-leash dog walking. Observations of 1850 dogs and their owners were made in streets and parks in Brno (Czech Republic). Multiple logistic regression analysis showed no significant effect of human gender on the frequency of unleashed dogs in streets and parks. Off-leash dog walking was 2.8 times more likely in parks than in streets. Adult dogs were unleashed 1.9 times more likely than puppies in streets and parks. Larger dogs were unleashed 3.4 times less likely than smaller dogs in streets and 2.8 times more likely in parks. Male dogs were unleashed 1.7 times less likely than female dogs in streets. The dog's sex had no effect on off-leash dog walking in parks. The age and sex of dogs walked by men and women in public places were not significantly different. Larger dogs were walked by men 1.9 times more likely than by women. Results indicate that off-leash dog walking is affected by the type of public place and dog's age, sex and size.

Keywords: dog, human, off-leash walking, park, street

INTRODUCTION

The increasing incidence of obesity and weight-related health risks in human (Reiner *et al.*, 2013) and canine (German, 2006) populations is a problem in many countries. Physical activities are generally seen to be an important component of weight management. Effective approaches are needed for their promotion. Dog walking may be such a strategy that can help encourage physical activity and improve the health of humans (Epping, 2011) and dogs (Degeling *et al.*, 2012). Dog owners report more walking during leisure time than people who do not own a dog (Brown and Rhodes, 2006). However, dog ownership does not guarantee that owners will regularly walk with their dogs (Bauman *et al.*, 2001).

There are many factors influencing dog walking in public places. Walking with a dog can increase feelings of safety (Cutt *et al.*, 2008). Dogs may provide motivation for physical activity similar to having a walking partner (Feng *et al.*, 2014). Walking with a dog can facilitate social interactions between people and conversations with strangers more than when walking alone (Wells, 2004). The importance of physical activity for the dog's wellbeing can also be an appropriate stimulus to increase dog walking (Hoerster *et al.*, 2011). Many dog owners perceive that providing sufficient off-leash walking is important and enhances the quality of life of the dog (Bekoff and Meaney, 1997). However, little is known about factors that influence the owners' decisions to walk their dogs off a leash in public places.

The objective of the study was to assess the effect of the type of public place, dog's age, sex and size, human gender, and their two-way interactions on off-leash dog walking. Simultaneously, the age, sex and size of dogs walked by men and women in public places was examined.

MATERIALS AND METHODS

Subjects and Procedures

Off-leash and on-leash dog walking were studied in locations where owners frequently walked their dogs. Observations were made in streets and five

parks in the City of Brno (Czech Republic) from September to November 2014. All these parks were used for leisure time activities by both dog owners and people who did not own a dog. Only owners with one dog were chosen for observation. Owners with two or more dogs were not included in the study, because the effect of the dog's age, sex and size on the occurrence of unleashed dogs was assessed. Dogs with two or more owners were not chosen for observation, because the effect of the gender of the owner on the occurrence of unleashed dogs was tested in the present study. The assumption was made that dogs and people walking together belonged to the same household.

Data were collected by direct observation. Dogs and their owners on the walk were recorded by one person. To avoid pseudo-replication, only one observation per human-dog dyad was recorded. A standard procedure was used for all observations. Data were collected using a combination of focal-animal and all-occurrences sampling (Altmann, 1974). For each observation, the public place (street, park), gender of the owner (male, female), breed of dog (particular breed, crossbreed, unknown breed), age of dog (puppy, adult), sex of dog (male, female), size of dog (smaller, larger) and the use of a leash were recorded. Off-leash dog walking is legal in the Czech Republic, but dogs must be muzzled in public.

Dogs were classified as pure breeds based on the Fédération Cynologique Internationale (FCI) breed standards categories. The remaining dogs were classified as crossbreeds or unknown breeds (including some breeds that were difficult to identify accurately). Dogs were classified as smaller (less than 50 cm) and larger (50 cm and more) based on height at the withers as specified in the FCI breed standards. In breeds, for which the height at the withers is not specified in the FCI breed standards, and in crossbreeds or unknown breeds the size was classified subjectively based on the description of the dog. Puppies and adults were distinguished visually. Dogs with juvenile morphology were classified as puppies. The remaining dogs were classified as adult dogs. The owner accompanying the dog was asked to provide information in cases when age determination based on external morphological characteristics was unclear. In such a case, puppies were individuals less than 12 months of age in smaller breeds and less than 16 months of age in larger breeds (Pineda and Dooley, 2003). Older dogs were classified as adult dogs.

Statistical Analyses

Statistical evaluation of the data was performed using the SAS software (SAS Institute Inc., Cary, NC, USA). Observations of 1850 dogs that were on walks with their owners were made in public places. The effects of the public place, dog's age, sex and size, human gender, and their two-way interactions on off-leash dog walking were analyzed using the multiple logistic regression model. Logistic regression analysis was performed according to the method of Hosmer and Lemeshow (2000). Initially all variables were tested for univariate associations, and only those showing significant difference between groups at $P < 0.2$ were included in the initial model. A backward approach was used to select variables for the final model. Modeling was continued until all the main effects and interaction terms were significant according to the Wald statistic at $P < 0.05$. The regression coefficients from

I: *Characteristics of 1850 dogs and their owners walking in public places*

Characteristics	*n* (%)
The use of a leash	
Off a leash	1111 (60)
On a leash	739 (40)
The type of public place	
Park	1454 (79)
Street	396 (21)
Dog's age	
Puppy	156 (8)
Adult	1694 (92)
Dog's sex	
Male	1107 (60)
Female	743 (40)
Dog's size	
Smaller	1098 (59)
Larger	752 (41)
Human's gender	
Male	671 (36)
Female	1179 (64)

II: *Parameters with no significant effect on off-leash dog walking as analyzed by multiple logistic regression*

Parameters	Wald Chi-Square	DF	P value
Human's gender	0.600	1	0.439
Human's gender*Dog's age	1.071	1	0.301
Human's gender*Dog's sex	0.699	1	0.403
Human's gender*Dog's size	0.462	1	0.497
Human's gender*Public place	2.688	1	0.101
Dog's age*Dog's sex	0.144	1	0.704
Dog's age*Dog's size	2.802	1	0.094
Dog's age*Public place	0.508	1	0.476
Dog's sex*Dog's size	0.565	1	0.452

the logistic regression were exponentiated to obtain odds ratios (OR) and corresponding 95% confidence intervals associated with each factor. A positive regression coefficient (corresponding to OR > 1) indicates that the term is associated with an increase in the probability of a higher outcome score, whereas a negative coefficient (corresponding to 0 < OR < 1) indicates that the term is associated with an increased probability of a lower outcome score. Differences between men and women in relation to their dog's age, sex and size were analyzed using the binary logistic regression.

RESULTS

Factors Affecting Off-leash Dog Walking

Basic characteristics of dogs and their owners are shown in Tab. I. The proportion of unleashed and leashed dogs was 60% and 40%, respectively. Logistic regression analysis showed that there was no significant effect of human gender and most of the two-way interactions on the frequency of off-leash dog walking (Tab. II). The Hosmer and Lemeshow goodness-of-fit test ($X^2 = 3.475$, DF = 6, $p = 0.747$) indicated that the final model was adequate. Variables included in the final model were the public place, dog's age, sex and size, interactions between the public place and dog's size, and interactions between the public place and dog's sex (Tab. III). Values of R^2 suggested that the variables in the model explained between 19.1% (Cox and Snell R^2) and 25.9% (Nagelkerke R^2) of the variance in the dependent variable. Off-leash dog walking was 2.8 times more likely in parks than in streets. Adult dogs were unleashed 1.9 times more likely than puppies in public places. No interactions between the public place and dog's age (Tab. II) indicated that the difference between the frequency of unleashed adult dogs and puppies in streets was similar to parks.

The final logistic regression model (Tab. III) included two interactions, one between the public place and dog's size, and the other between the public place and dog's sex. Since the final model had two interactions, in both cases it was necessary to determine how the effect of a predictor variable depended on the value of another predictor variable. Therefore, we computed the odds ratios of the dog's size and odds ratios of the dog's sex for each of the two public places from Tab. III. Larger dogs were unleashed 3.4 (1/0.29) times less likely than smaller dogs in streets and 2.8 (0.29*9.69) times more likely in parks. Male dogs were unleashed 1.7 (1/0.58) times less likely than female dogs in streets and 1.1 (0.58*1.98) times more likely in parks.

Dogs Walked by Men and Women

Binary logistic regression showed that the age and sex of dogs walked by men and women in public places were not significantly different (Tab. IV). Larger dogs were walked by men 1.9 times more likely than by women.

DISCUSSION

Dogs were unleashed 2.8 times more likely in parks than in streets. This indicates that the use

III: *Parameters remaining in final multiple logistic regression model for off-leash dog walking*

Parameters	Wald Chi-Square	DF	P value	Odds Ratio	95% CI for Odds Ratio	
					Lower	Upper
Public place	20.300	1	0.001	2.758	1.774	4.288
Dog's age	11.676	1	0.001	1.882	1.310	2.705
Dog's sex	4.710	1	0.030	0.582	0.357	0.949
Dog's size	9.998	1	0.002	0.287	0.133	0.622
Dog's sex*Public place	6.074	1	0.014	1.976	1.150	3.397
Dog's size*Public place	30.201	1	0.001	9.687	4.310	21.767

IV: *Differences between men and women in relation to their dog's age, sex and size as analyzed by binary logistic regression*

Parameters	Wald Chi-Square	DF	P value	Odds Ratio	95 % CI for Odds Ratio	
					Lower	Upper
Dog's age	0.635	1	0.426	1.152	0.814	1.630
Dog's sex	1.769	1	0.184	1.141	0.940	1.385
Dog's size	44.642	1	0.001	1.931	1.592	2.342

of a leash is influenced by the type of public place where owners walk their dogs. One of the reasons may be that owners perceive streets as not so safe for dogs. In streets, the use of a leash can minimize the danger of the dog running away from the pavement into traffic and being hit by a car or other road vehicle. On the other hand, parks situated away from busy streets can be much safer for the dogs and promote the owners' decisions to walk their dog off a leash. Similarly, a high frequency of unleashed dogs was also observed on coastal beaches in Victoria, southeastern Australia, situated away from busy roads (Williams *et al.*, 2009). The study of Bekoff and Meaney (1997) showed that unleashed dogs generally stay fairly close to their owners in public places.

Owners walked their dog off a leash mostly in parks, possibly because these public places offer a more suitable environment for dogs to play and exercise with other dogs. The occurrence of play between dogs was more than two times higher when both dogs were off a leash than when one or both dogs were on a leash (Rezac *et al.*, 2011). When dogs play they typically use action patterns that are also used in other contexts, such as predatory behavior, pack behavior, and mating (Bekoff, 2001; Bauer and Smuts, 2007). Canine social play includes behaviors such as chasing, play-fighting games, inhibited biting, and mounting behavior (Ward *et al.*, 2008). In other words, play between dogs enhances their physical activity that can improve the health and quality of life of dogs.

The use of a leash has an effect not only on the frequency of play, but also on aggressive behavior between dogs. Thus, another reason why owners walked their dog mostly off a leash in parks may be that being on a leash actually encourages aggressive behavior in some dogs rather than reduce it. The occurrence of threat was two times higher between dogs on a leash than off a leash when dogs were on walks with their owners (Rezac *et al.*, 2011). Similarly, the study of Bekoff and Meaney (1997) also suggests that leashed dogs are less friendly than unleashed dogs. The effect of a leash may have some association with pack behavior. Dogs that show a threat on a leash possibly have a greater confidence in the very close presence of the owner (Rezac *et al.*, 2011). In some cases, leashed dogs may feel more vulnerable because they are unable to run away and may therefore display a threat when other dogs approach too close.

Puppies were unleashed less likely than adult dogs in streets. A possible explanation might be that owners perceive streets as being more dangerous for unleashed puppies than for adult dogs. Puppies may react less often than adult dogs when owners call them back, and therefore, the chance that puppies will run out into traffic is higher. Results in the present study showed that off-leash walking of puppies was much more frequent in parks than in streets. Parks are probably much safer areas suitable for unleashed puppies to play with other dogs. Playing and sniffing behaviors are the most frequent interactions that puppies display (Rezac *et al.*, 2011). During social play, puppies learn social skills and they form bonds with other dogs (Ward *et al.*, 2008). Not only play, but also the need to socialize may affect the owners' decisions to walk their puppy off a leash. The period of socialization begins at 3 weeks and ends at approximately 12 weeks of age (Freedman *et al.*, 1961). During socialization, puppies should have adequate contact with other dogs. However, the use of a leash has a reducing effect on the amount of interactions between dogs (Westgarth *et al.*, 2010). Therefore, off-leash walking is recommended to intensify the process of puppy socialization. As the animal matures, deficits in social interaction during the early stage of the dog's life can result in a higher risk of aggression towards other dogs (Roll and Unshelm, 1997). Our findings showed that puppies were unleashed less likely than adult dogs in parks. A possible reason may be that adult dogs show a threat more often when they encounter puppies than when they encounter adult dogs (Rezac *et al.*, 2011). This may be their negative reaction to the strong desire of puppies to play because adult dogs are not so keen to play as puppies.

Larger dogs were unleashed 2.8 times more likely than smaller dogs in parks. This indicates that the use of a leash in parks is influenced by the size of the dog. Owners of smaller dogs are probably more afraid than owners of larger dogs that their dog may be injured or killed during interaction with other dogs. Contrary to parks, larger dogs were unleashed 3.4 times less likely in streets than smaller dogs. We hypothesize that this may be due to the close proximity of dogs with unfamiliar people. They possibly tolerate unleashed smaller dogs more than larger dogs because the probability of injury is greater when a person is bitten by the large dog than a small dog (Rezac *et al.*, 2015).

The sex of the dog had an effect on the use of a leash in streets. Owners walked their male dogs off a leash 1.7 times less likely than female dogs in streets. We hypothesize that this may be associated

with the occurrence of aggressive behavior toward people. Male dogs show aggression toward people more often than female dogs (Fatjo *et al.,* 2007; Rosado *et al.,* 2009). Contrary to streets, the sex of the dog had no influence on the use of a leash in parks. Based on the facts that off-leash dog walking enhances the amount of interactions between dogs (Westgarth *et al.,* 2010) and that dogs were unleashed much more often in parks than in streets, the higher probability that dogs will interact with other dogs in parks might reduce their interest in interacting with unfamiliar people.

No significant differences between men and women were found in the frequency of unleashed dogs in public places. Thus, the use of a leash was not influenced by the gender of the owner. This suggests that men's decision making process on walking their dogs off a leash may be the same as women's. No interactions with the human gender indicate that the type of public place and dog's age, sex and size have probably the same effect on men's and women's decision making process on walking their dogs off a leash. In other words, both men and women may be affected by the same factors.

The frequency of male and female dogs walked in public places by men and women was not significantly different. This suggests that the gender of the owner had no effect on the sex of the dog walked in public places. A similar influence was found in terms of the age of the dog. In contrast to the sex and age of dogs, the gender of the owner had a considerable effect on the size of the dog walked in public places. Men walked larger dogs 1.9 times more likely than women. A possible explanation may be that larger breeds such as the German Shepherd, Labrador Retriever, Doberman Pinscher are used as working breeds more often than smaller breeds and men use dogs for working purposes more frequently than women.

CONCLUSION

Off-leash dog walking was considerably influenced by the type of public place, dog's age, sex and size, interactions between the public place and dog's size, and interactions between the public place and dog's sex. The gender of the human had no significant effect on the frequency of unleashed dogs in streets and parks. Larger dogs were more likely walked by men than by women in public places.

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REFERENCES

ALTMANN, J. 1974. Observational study of behavior: sampling methods. *Behaviour*, 49(3): 227–267.

BAUER, E. B. and SMUTS, B. B. 2007. Cooperation and competition during dyadic play in domestic dogs, Canis familiaris. *Anim. Behav.*, 73(3): 489–499.

BAUMAN, A. E., RUSSELL, S. J., FURBER, S. E. and DOBSON, A. J. 2001. The epidemiology of dog walking: an unmet need for human and canine health. *Med J Aust.*, 175(11–12): 632–634.

BEKOFF, M. 2001. Social play behaviour: cooperation, fairness, trust, and the evolution of morality. *J. Conscious. Stud.*, 8(2): 81–90.

BEKOFF, M. and MEANEY, C. A. 1997. Interactions among dogs, people, and the environment in Boulder, Colorado: A case study. *Anthrozoös*, 10(1): 23–31.

BROWN, S. G. and RHODES, R. E. 2006. Relationships among dog ownership and leisure-time walking in Western Canadian adults. *Am. J. Prev. Med.*, 30(2): 131–136.

CUTT, H. E., GILES-CORTI, B., WOOD, L. J., KNUIMAN, M. W. and BURKE V. 2008. Barriers and motivators for owners walking their dog: results from qualitative research. *Health Promot. J. Austr.*, 19(2): 118–124.

DEGELING, C., BURTON, L. and MCCORMACK, G. R. 2012. An investigation of the association between socio-demographic factors, dog-exercise requirements, and the amount of walking dogs receive. *Can. J. Vet. Res.*, 76(3): 235–240.

EPPING, J. N. 2011. Dog ownership and dog walking to promote physical activity and health in patients. *Curr. Sports Med. Rep.*, 10(4): 224–227.

FATJO, J., AMAT, M., MARIOTTI, V. M., RUIZ DE LA TORRE, J. L. and MANTECA, X. 2007. Analysis of 1040 cases of canine aggression in a referral practice in Spain. *J. Vet. Behav.-Clin. Appl. Res.*, 2(5): 158–165.

FENG, Z., DIBBEN, C., WITHAM, M. D., DONNAN, P. T., VADIVELOO, T., SNIEHOTTA, F., CROMBIE, I. K. and MCMURDO, M. E. 2014. Dog ownership and physical activity in later life: a cross-sectional observational study. *Prev. Med.*, 66:101–106.

FREEDMAN, D. G., KING, J. A. and ELLIOT, O. 1961. Critical period in social development of dogs. *Science*, 133(3457): 1016–1017.

GERMAN, A. J. 2006. The growing problem of obesity in dogs and cats. *J. Nutr.*, 136(7 Suppl.): 1940–1946.

HOERSTER, K. D., MAYER, J. A., SALLIS, J. F., PIZZI, N., TALLEY, S., PICHON, L. C. and BUTLER D. A. 2011. Dog walking: its association with physical activity guideline adherence and its correlates. *Prev. Med.*, 52(1): 33–38.

HOSMER, D. W. and LEMESHOW, S. 2000. *Applied Logistic Regression*. New York: John Wiley and Sons.

PINEDA, M. and DOOLEY, M. P. 2003. *McDonald's Veterinary Endocrinology and Reproduction*. Ames: Iowa State Press.

REINER, M., NIERMANN, C., JEKAUC, D. and WOLL, A. 2013. Long-term health benefits of physical activity - a systematic review of longitudinal studies. *BMC Public Health*, 13: 813.

REZAC, P., REZAC, K. and SLAMA, P. 2015. Human behavior preceding dog bites to the face. *Vet. J.*, 206(3): 284–288.

REZAC, P., VIZIOVA, P., DOBESOVA, M., HAVLICEK, Z. and POSPISILOVA, D. 2011. Factors affecting dog – dog interactions on walks with their owners. *Appl. Anim. Behav. Sci.*, 134(3–4): 170–176.

ROLL, A. and UNSHELM, J. 1997. Aggressive conflicts amongst dogs and factors affecting them. *Appl. Anim. Behav. Sci.*, 52(3–4): 229–242.

ROSADO, B., GARCÍA-BELENGUER, S., LEÓN, M. and PALACIO, J. 2009. A comprehensive study of dog bites in Spain, 1995-2004. *Vet. J.*, 179(3): 383–391.

WARD, C., BAUER, E. B. and SMUTS, B. B. 2008. Partner preferences and asymmetries in social play among domestic dog, Canis lupus familiaris, littermates. *Anim. Behav.*, 76(4): 1187–1199.

WELLS, D. L. 2004. The facilitation of social interactions by domestic dogs. *Anthrozoös*, 17(4): 340–352.

WESTGARTH, C., CHRISTLEY, R. M., PINCHBECK, G. L., GASKELL, R. M., DAWSON, S. and BRADSHAW, J. W. S. 2010. Dog behaviour on walks and the effect of use of the leash. *Appl. Anim. Behav. Sci.*, 125(1–2): 38–46.

WILLIAMS, K. J. H., WESTON, M. A., HENRY, S. and MAGUIRE, G. S. 2009. Birds and beaches, dogs and leashes: Dog owners' sense of obligation to leash dogs on beaches in Victoria, Australia. *Hum. Dimens. Wildl.*, 14(2): 89–101.

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