

## **Dogs as catalysts for social interactions: Robustness of the effect**

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It is known that pet dogs can act as catalysts for human social interactions, and it has been suggested that this may enhance feelings of well-being. Two studies were carried out to establish the robustness of this effect. In Study 1, a highly trained dog was used to ensure that the dog itself did not solicit attention from passers-by, and data were collected across a range of normal daily activities in which a dog could be included, not confined to conventional dog walking areas as in previous studies. Being accompanied by a dog increased the frequency of social interactions, especially interactions with strangers. In Study 2, also using a trained dog, a different (male) participant observer was dressed either smartly or scruffily. Although there were significantly more interactions when he was smartly dressed, the greatest effect was between the Dog present and No Dog conditions irrespective of the handler's dress. It is concluded that the social catalysis effect is very robust, which opens the way for investigating possible consequences of the effect for well-being and health.

There are now many published studies supporting the claim that pet ownership is associated with enhancements to psychological and physical well-being. The evidence is not incontrovertible, but it is clearly necessary to consider the mechanisms that might underlie such enhancements. It is likely that there are a number of different mechanisms representing different ways in which pets may positively impact on well-being and health (McNicholas & Collis, 1998). One suggested mechanism is that pets may enhance social interactions between people, increasing or strengthening social networks and social provisions thus elevating psychological well-being. This study investigates the role of pets as social catalysts as a prelude to an investigation of their effects on the size, composition and provision of social networks.

Recent evidence demonstrating that pet ownership may be associated with enhancements to physical health includes a large-scale study conducted in a cardiovascular risk screening clinic in Australia in which pet owners were found to be at lower risk for cardiovascular disease as indicated by a number of risk factors (Anderson, Reid, & Jennings, 1992). Levels of plasma triglycerides, cholesterol and systolic blood pressure were found to be lower in pet owners than in non-owners across ages and sexes, but especially amongst men over 40 years of age. These

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differences could not be explained by differences in socio-economic background, age, exercise, dietary habits or the consumption of tobacco or alcohol. Other studies have reported that pet owners have better survival rates and recovery from myocardial infarction (Friedmann, Katcher, Lynch, & Thomas 1980 (but see Wright & Moore, 1982); Friedmann & Thomas, 1995) and that the acquisition of a pet is associated with lower incidence of minor physical illness and elevated psychological well-being (Serpell, 1991).

A further strand of research has focused less on health and more on how a sense of well-being might be derived from pet ownership. In particular, research has identified a role for pets, especially dogs, as catalysts for human-human interactions which, in turn, might promote a feeling of social integration. In an observational study, Messent (1983) demonstrated that dog owners walking their dogs in a park experienced a significantly higher number of chance conversations with other park users than when walking the same route without their dogs. Moreover, the conversations were significantly longer when their dog was present. It was suggested that the presence of a dog acted as an 'ice breaker', providing a neutral and safe opening for conversation. A different kind of explanation is that perceptions of a person's likeability may be increased by the presence of a dog (Roszbach & Wilson, 1992). Similar effects have been observed in owners of trained assistance dogs such as guide dogs (Delafield, 1975) and assistant dogs for people with disabilities (Eddy, Hart, & Boltz 1988; Hart, Hart, & Bergin, 1987; Mader, Hart, & Bergin, 1989) and suggest that the dogs may well be at least as valuable as a facilitator of social interactions for their owners as for the work the dog is specifically trained for.

Although the best evidence for the social catalysis effect of pets is from studies involving dog ownership, there is also some evidence suggesting that other animals may exert similar effects. For example, Mugford and M'Comisky (1975) referred to the 'social lubrication' effect experienced by older people after acquiring a pet budgerigar, whilst Hunt, Hart, and Gomulkiewicz (1992) report an increase in social interactions with park users when accompanied by a pet rabbit or by a turtle (tortoise).

Research into the association between pet ownership and health, and research into the catalysis effect of pets, has been conducted more or less independently of one another and may well represent two distinct kinds of influence on physical and psychological well-being. Explanations for the health advantages associated with pet ownership have tended to centre on the nature of the relationship between the owner and pet, and the perception of the pet as a significant relationship and a provider of social support and affection (Collis & McNicholas, 1998). The role of increased *human* contact derived from pet ownership, and the possible social provisions arising from this increased human contact, has been largely ignored as a factor contributing to elevated well-being. However, Lane, McNicholas, and Collis (1998), in a study of benefits associated with the ownership of a trained assistance dog by people with physical disabilities, found significant associations between enhanced social integration and increased self-perceived health amongst their subjects, in spite of the fact that the nature of their disabilities should preclude health improvement.

If the catalysis effect of pets is robust, then this may provide a plausible explanation for enhanced well-being via enhancements in social networks. Casual encounters,

such as those experienced by most dog walkers, could bring about a sense of social integration and provide the opportunities to develop the contact further. Some of these encounters could develop into more substantial social relationships, such as friendships where shared interests and activities extend beyond those centred on pet ownership. Such relationships might well be a source of relationship-based social support. To date no research has been conducted on whether the catalysis effect of pets can enhance social networks.

To examine whether pet ownership may beneficially influence health and well-being via increased human contact, two levels of investigation are required. First, it is necessary to establish that pets (in this case dogs) can reliably be regarded as effective social catalysts for a broad spectrum of dog owners—not just those meeting each other in parks, or belonging to a particular group of dog owners such as service dog owners. Secondly, any such enhancements to social contact with other people must be demonstrated to be of a nature that could potentially offer an explanation for the observed health advantages reported amongst pet owners. The two studies presented here represent investigations into the robustness of the catalysis effect of pets in generating interactions amongst people.

## STUDY 1

Study 1 sought to refine and extend the work of Messent (1983). The design was somewhat similar to Messent's in that direct observation was used to record the numbers of interactions experienced by a dog handler, but a number of important refinements were introduced.

First, it is important that observations should not be confined to conventional 'dog walking areas' such as parks or recreation grounds. Areas such as these were excluded from the study so as to minimize the effect of dog walkers meeting one another. Instead, the dog accompanied the experimenter in all daily routines such as accompanying her to take children to school, to her work at the university, on public transport, etc. In this respect the routines were similar to those of a service dog, although there were no contexts in which the presence of a dog was so unusual as to produce a novelty effect. It is not unusual to encounter dogs accompanying children to the school gates, or on public transport, especially since a number of dogs being trained for Guide Dogs for the Blind Association are puppy walked in the town and surrounding areas and this training involves the use of public transport. Dogs are also frequently seen on the university campus, either being owned by university staff or by local dog owners using recreation grounds adjacent to the university.

Secondly, it is possible that being accompanied by a dog might lead to increased social interaction because the dog itself solicited attention from passers-by. To rule this out, the dog used for the experiment was a dog undergoing the final stages of training as a Guide Dog for the Blind. She had been schooled not to solicit attention from people and to make herself as inconspicuous as possible.

Finally, the experimenter acted as a participant observer and ensured that she did not greet people or engage in behaviour likely to be interpreted as initiating interactions. Interactions were noted not just for their number and length as in the

Messent study, but also who the interaction was with, for example whether they were friends, acquaintances or strangers.

### Method

The dog selected for the experiment was a young adult cross-bred Labrador bitch owned by a local Guide Dog Training Centre. The experimenter was well-acquainted with the dog having conducted training assessments of the dog during its puppy walking period. The dog was therefore willing and accustomed to 'work' for the experimenter. The dog wore a plain collar and lead so as not to be identifiable as a guide dog. This particular dog was chosen for her quiet nature, her unremarkable appearance and her success in being trained to ignore passers-by whilst working or, when not working, to stand or sit unobtrusively at the experimenters side or to curl up under a seat and not to seek attention.

The experimenter acted as participant observer. For 5 days the dog accompanied her as she went about her daily routines of taking children to school, travelling to university by public transport, attending lectures, etc. (the Dog condition). The same routines were followed without the dog, also for 5 days (the No Dog condition). The two conditions were randomly distributed across the total of the 10 days of the experiment.

The measures of social interactions in both the Dog condition and the No Dog condition were:

- (1) number of interactions;
- (2) length of interactions;
- (3) gender of interactee;
- (4) whether the interactee was a friend, an acquaintance or a stranger.

The length of social encounters was coded as a brief non-verbal acknowledgement (a smile, nod, wave, etc.), talk for up to 1 minute; talk for up to 3 minutes and talk for longer than 3 minutes. For the categorization of interactees, friends were defined as people well known to the experimenter and with whom she regularly spent time; acquaintances were people known slightly, perhaps only by sight or to exchange a brief acknowledgement; strangers were those people not encountered before the experiment. Prior to the start of the experiment, preliminary work was conducted to ensure that the experimenter could reliably use the coding categories. This was achieved through the experimenter being accompanied by a colleague for 2 days of her normal daily routine. Experimenter and colleague independently assessed social encounters and codings were found to have a 72% agreement, the main differences being the colleague assigning some interactees to the 'friends' category while the experimenter felt they were more properly regarded as acquaintances.

### Results

In total, 206 encounters were observed, 156 when the experimenter was accompanied by the dog, and 50 when she was not. In 123 of the encounters, the interactee was female, in 83 male. This is likely to be a result of the larger numbers of females present in the psychology and humanities block of the university, and there was no comparable data available on gender distribution of potential interactees.

Formal statistical analysis comprised log-linear modelling of the four-dimensional contingency table obtained by cross-tabulating the 206 encounters by condition (Dog/No Dog), gender, interactee category (friend, acquaintance, stranger) and length of interaction.

The analysis confirmed the differences between the Dog and No Dog conditions in the overall frequency of interactions ( $\chi^2(1) = 57.3, p < .001$ ). However, the presence of the dog was associated with relatively few additional encounters with

friends, but many additional encounters with acquaintances and, more particularly, with strangers ( $\chi^2(2) = 30.8, p < .001$ ). This is illustrated in Table 1.

**Table 1.** Frequency of interactions by condition and category of interactee

	Friend	Acquaintance	Stranger	Total
Dog	34	57	65	156
No Dog	26	21	3	50
Total	60	78	68	206

Although there was a substantial increase in the numbers of encounters experienced when in the presence of the dog, there was no interaction between the presence of the dog and the length of the encounters ( $\chi^2(3) = 2.5, n.s.$ ), that is, the presence of the dog did not influence the length of interactions. There was no interaction between the presence of the dog and the sex of the interactee ( $\chi^2(1) < 1, n.s.$ ), that is, the gender of the interactee did not influence the social catalysis effect of the dog.

### Discussion

The experiment clearly demonstrated that more social interactions took place when the experimenter was accompanied by the dog. In this respect, the findings of Messent (1983) were supported. Moreover, it would appear that the catalysis effect of the dog was achieved even though the dog had been schooled not to solicit attention. However, length of interactions was not found to be influenced by the presence of the dog. In this respect the findings of Messent (1983) were not supported.

The study also shows for the first time that the extent to which the dog acts as a social catalyst depends on the nature of the relationship between the participants. The data quite clearly show that the effect is largest with strangers and smallest with friends. This finding fits an interpretation that the dog removed or permitted the circumvention of inhibitions against striking up casual conversations.

The number of interactions with acquaintances was also considerably enhanced when the dog was present. Whilst these had regularly exchanged brief or non-verbal acknowledgements with the experimenter, the presence of the dog appeared to encourage verbal exchanges.

It was also noted that, for a small subset of female acquaintances, the catalysis effect appeared to carry over to subsequent interactions when the dog was absent, i.e. acquaintances speaking to the experimenter in the Dog condition frequently approached her when encountering her in a No Dog condition. Often interactions of this type were prefaced by an inquiry about the whereabouts of the dog. The size of the sample was too small to be certain that this is a reliable effect, although the experimenter was subjectively aware that for some months after the experiment, a number of people categorized as acquaintances regularly spoke to her when they met.

For these people it does appear that the presence of the dog 'broke the ice' and paved the way for more social interactions long after the dog ceased to accompany her.

Although the study successfully demonstrates that interactions were initiated by passers-by rather than the dog or handler, and that some interactions led to longer term acquaintances and friendships, it could be argued both dog and handler in this study could be perceived as approachable and this may have influenced results. The dog was a small yellow Labrador type, whilst the handler (the first author) was a small female who was usually neatly dressed. This obviously raises questions of whether the catalysis effect would operate for people and/or pets whom people may perceive as less approachable or 'respectable'. In short, does the robustness of the effect depend on the appearance of the dog and/or handler, does it extend to a male handler?

## STUDY 2

A second study was conducted to investigate the robustness of the social catalysis effect of dogs, in particular whether the catalysis effect was influenced by the appearance of the dog and/or handler.

### Method

The handler was a white male undergraduate student, in his mid-thirties, of average height and build. Once again, a trained guide dog, not in harness, was used to ensure that no interactions were due to the dog soliciting attention. However, for this experiment, a large black Labrador was used to reduce any perceived 'prettiness' of the dog.

The appearance of both the dog and the handler was manipulated to achieve the effect of a smart person with a pet dog and a roughly dressed person with a more aggressive looking dog. In one Dog condition the handler was dressed in a smart but casual manner in sports jacket, collar and tie and neatly pressed trousers with the dog wearing a coloured matching collar and lead. In the other Dog condition, the handler was dressed in torn, dirty jeans, scuffed work boots, old tee-shirt and a stained donkey jacket, whilst the dog wore a studded leather collar with a piece of frayed rope as a lead. An independent study, in which 60 participants made judgments about photographs of the same dog in these two modes of dress, confirmed that the dog's appearance markedly influenced perceptions of the dog's temperament ( $F(1,58) = 4.69, P < .05$ ) and how comfortable the participant would feel approaching/being approached by the dog ( $F(1,58) = 7.98, P < .01$ ). There were also No Dog conditions in which the handler appeared in the two forms of dress but without the dog. In two additional conditions the handler and dog appeared as if incongruently attired, i.e. a scruffy person with a smart pet dog, and a smart person with the dog in a studded collar and rope lead.

Data were collected in four locations in the centre of a small English city, where it would not be unusual to see a person with a dog but which would not be regarded as a dog walking area, such as a park, where it is likely to meet numerous dog walkers. Eight trials, each lasting for 30 minutes, were conducted for each of the six conditions: Experimenter alone, smart dress; Experimenter alone, scruffy dress; Experimenter, smart with pet dog; Experimenter, scruffy with 'rough' dog; Experimenter scruffy, with pet dog; Experimenter smart, with 'rough' dog.

All trials were held at comparable times on Saturdays for each location. The procedure was for the experimenter to stand for 30 minutes at an appointed place (one of four previously selected locations) as if waiting. The number of people who interacted with the experimenter was recorded for each trial in each condition. Interactions were categorized as non-verbal (smiles, nods, etc.) or verbal. The length of the interactions was recorded by the experimenter using a concealed stop-watch. These were categorized as up to 30 seconds; 30 seconds-1 minute; 1-3 minutes; over 3 minutes. A second person, placed at a discreet distance from the experimenter, attended a selection of trials to monitor consistency and accuracy of recording. The 48 trials form the units of analysis in the ANOVAs.

### Results

A total of 1170 interactions was recorded over the 48 trials. The breakdown by condition is shown in Table 2. Only 8 of the 1170 exchanges involved an interectee

**Table 2.** Total frequency of interactions by condition and appearance of dog and handler

	No dog	Pet dog	Rough dog	Total
Scruffy person	27	214	224	465
Smart person	30	325	350	705
Total	57	539	574	1170

*Note.* Each cell represents eight 30-minute trials.

who was accompanied by a dog. In 144 (12.3%) of the interactions, all in the dog-present conditions, the inter.ctee made verbal reference about the dog.

An ANOVA on the total number of social interactions, with dog conditions, and person conditions as factors and location as a covariate, showed a main effect of dog conditions ( $F(1,39) = 57.61, P < .0005$ ). *Post hoc* tests revealed this to be attributable to significant differences between the No Dog condition and both of the Dog conditions (Tukey's HSD test,  $P < 0.001$ ). There was a main effect of person condition ( $F(1,39) = 13.25, p = .001$ ) with the handler in smart dress achieving more interactions ( $M = 29$  per 30-minute trial) than when in scruffy dress ( $M = 19$  per 30-minute trial). A main effect of location ( $F(3,39) = 6.11, p = .002$ ) was due to one location, the busiest, attracting more interactions ( $M = 34$  per 30-minute trial) than the other three ( $M = 21$  per 30-minute trial). The statistical interaction between dog conditions and person conditions approached significant ( $F(2,39) = 3.11, p = .056$ ) and Table 2 clearly shows that the effect of the person's appearance was much smaller when the dog was absent than in the dog-present conditions.

Although significantly more interactions were observed when the handler was smartly dressed than when he was scruffily dressed, this effect was considerably smaller in magnitude than the effect of having a dog present. When the handler was smartly dressed, interactions increased by over 1000% when accompanied by a pet dog, and by over 1100% when with a 'rough' dog. When the handler was scruffily dressed, interactions increased by 790% when with a pet dog, and by 830% when with a rough dog (Table 2).

Somewhat surprisingly, there were more interactions when the dog appeared as a 'rough' dog, wearing a studded collar and frayed rope lead than when she wore a coloured collar with matching lead. The handler had been instructed to note the number of positive and negative interactions (since a dog made to look fierce or unpredictable may provoke adverse comment) but he reported no negative comments regarding the dog or her appearance.

There was a significant effect of dog conditions on the length of interactions with passers-by ( $F(3,126) = 81.19, p < .05$ ). Pairwise comparisons showed a significant

difference between the No Dog condition and both dog-present conditions but only for brief exchanges such as verbal greetings or short/passing comments of up to 30 seconds (Tukey's HSD tests,  $p < .005$ ). No effect was observed for longer durations of exchanges.

When the interactions were broken down according to the sex of the interactee, and this factor entered into the ANOVA as a within-trials factor, it was apparent that overall there were significantly more interactions from females than from males ( $M =$  respectively 14.5 and 9.9 per trial,  $F(1,39) = 79.65$ ,  $p < .0005$ ). This has to be interpreted cautiously since the male/female ratio among available passers-by is not known. However, there was a significant interaction between the sex of the interactee and the dog factor ( $F(2,39) = 27.28$ ,  $p < .0005$ ). In the No Dog condition the numbers of female and male interactees, although small, were very similar ( $M =$  respectively 1.4 and 2.2 per trial) whereas there were considerably more females than males in dog-present conditions ( $M =$  pet dog 20.7 and 14.1; rough dog 21.8 and 14.1 per trial). Tukey tests indicated that the female-male differences were significantly larger in the Dog conditions than in the No Dog conditions. This strongly suggests that the presence of the dog modified possible inhibitions against female passers-by interacting with an unknown male.

### Discussion

The results indicate that the catalysis effect of having a dog present persisted even when the appearance of the dog and/or experimenter was less appealing. There was only a trivial difference between the two person conditions where the dog was absent. Conditions where the dog was present elicited a very large increase in both non-verbal and verbal interactions. Surprisingly, the appearance of the dog, i.e. as a pet or a 'rough' dog, did not detract from this effect. In contrast, the appearance of the experimenter did have an effect on the number of interactions.

### GENERAL DISCUSSION

The two studies were designed to examine further the claims made by Messent (1983) that dogs could act as powerful catalysts of social interaction. The combined outcomes of the two studies may be summarized as follows:

- (1) Dogs may act as powerful social catalysts even when trained to ignore passers-by or potential interactees. Thus the effect is not simply a consequence of initiations by the dog or handler.
- (2) The effect is not confined to areas commonly associated with the activity of dog walking. It is therefore improbable that the effect is solely attributable to a perception of mutually identified activity, as when two dog walkers meet in a park or recreation area.
- (3) The outward appearance of a dog does not appear to detract greatly from its ability to act as a social catalyst, as demonstrated by same dog appearing as a pet dog and as a 'rough' dog in studded collar and with a frayed rope lead. However, in both the conditions the dog was calm and well-behaved. It is



unlikely that a poorly behaved dog, or one that was exhibiting signs of aggression would have the same effect. Similarly, it could be argued that breeds of dog reputed to be aggressive (e.g. Dobermanns, Rottweilers) may not act as social catalysts, although the first author's personal experience of handling these breeds does not support this view.

- (4) The outward appearance of a person does not seem to detract greatly from the ability of a dog to facilitate interactions with that person. Whether smartly dressed or scruffily dressed, the handler experienced a very large increase in interactions when accompanied by a dog.
- (5) The greatest increases in interactions were found to be amongst strangers (from Study 1) and for brief, casual interactions (Study 2), suggesting that people are motivated by the presence of a dog to exchange greetings and brief comments, but not to participate in longer exchanges.
- (6) The observation in Study 1 that some acquaintances who engaged the experimenter in conversation prompted by the dog, continued to converse with the experimenter after the experiment had finished and when no dog was present, strongly suggests that the catalysis effect can have a long-lasting influence. It seems that the presence of a dog on one occasion can act as an 'ice breaker' and provide a focus for subsequent conversations when the dog is absent, in a way that just meeting the same person regularly does not.

In conclusion, the two studies demonstrate that the catalysis effect of dogs in generating human-human interactions is a robust phenomenon which can be generalized beyond conventional dog walking areas, such as parks, and is not negated by the appearance of either the dog or handler. The findings provide a firm foundation for further investigation to discover whether these casual exchanges can lead to the formation of more substantial relationships and whether these qualitative or quantitative enhancements to social networks can offer an explanation for reported health advantages amongst pet owners.

### Acknowledgements

June McNicholas is a Waltham Research Fellow. During the preparation of this paper, the authors were in receipt of financial support from the ESRC, grant number R022250014. The authors thank Dick Lane, Ian Morley and Ian Robinson for assistance and encouragement, Alan Davies for collecting the data in Study 2, and Emma Myring and Thea Oakley for data on judgments about the appearance of the dog used in Study 2.

### References

- Anderson, W. P., Reid, C. M., & Jennings, G. L. (1992). Pet ownership and risk factors for cardiovascular disease. *Medical Journal of Australia*, *157*, 298-301.
- Collis, G. M., & McNicholas, J. (1998). A theoretical basis for health benefits of pet ownership. In C. C. Wilson & D. C. Turner (Eds.), *Companion animals in human health* (pp. 105-122). Thousand Oaks, CA: Sage.
- DeLafield, G. (1975). *Self perception and the effects of mobility training*. Unpublished PhD thesis, University of Nottingham, UK.
- Eddy, J., Hart, L. A., & Boltz, R. P. (1988). The effects of service dogs on social acknowledgement of people in wheelchairs. *Journal of Psychology*, *122*, 39-45.

- Friedmann, E., Katcher, A. H., Lynch, J. J., & Thomas, S. A. (1980). Animal companions and one year survival of patients after discharge from a coronary care unit. *Public Health Reports*, *95*, 307-312.
- Friedmann, E., & Thomas, S. A. (1995). Pet ownership, social support, and one year survival after acute myocardial infarction in the Cardiac Arrhythmia Suppression Trial (CAST). *American Journal of Cardiology*, *76*, 1213-1217.
- Hart, L. A., Hart, B. L., & Bergin, B. (1987). Socializing effects of service dogs for people with disabilities. *Anthrozoös*, *1*, 41-45.
- Hunt, S. J., Hart, L. A., & Gomulkiewicz, R. (1992). Role of small animals in social interactions between strangers. *Journal of Social Psychology*, *132*, 245-256.
- Lane, D. R., McNicholas, J., & Collis, G. M. (1998). Dogs for the disabled: Benefits to recipients and welfare of the dog. *Applied Animal Behaviour Science*, *59*, 49-60.
- Mader, B., Hart, L. A., & Bergin, B. (1989). Social acknowledgements for children with disabilities: Effects of service dogs. *Child Development*, *60*, 1529-1534.
- McNicholas, J., & Collis, G. M. (1998). Could Type A (coronary-prone) personality explain the association between pet ownership and health? In C. C. Wilson & D. C. Turner (Eds.), *Companion animals in human health* (pp. 173-186). Thousand Oaks, CA: Sage.
- Messent, P. R. (1983). Social facilitation of contact with other people by pet dogs. In A. H. Katcher & A. M. Beck (Eds.), *New perspectives on our lives with companion animals* (pp. 37-46). Philadelphia: University of Philadelphia Press.
- Mugford, R. A., & M'Comisky, J. G. (1975). Some recent work on the psychotherapeutic value of caged birds with old people. In R. S. Anderson (Ed.), *Pets, animals and society* (pp. 54-65). London: Bailliere Tindall.
- Rossbach, K. A., & Wilson, J. P. (1992). Does a dog's presence make a person appear more likeable? *Anthrozoös*, *5*, 40-51.
- Serpell, J. A. (1991). Beneficial effects of pet ownership on some aspects of human health and behaviour. *Journal of the Royal Society of Medicine*, *84*, 717-720.
- Wright, J. C., & Moore, D. (1982). Comments on animal companions and one year survival of patients after discharge. *Public Health Reports*, *97*, 380-381.

*Received 9 June 1998; revised version received 23 April 1999*