

Evidence for long term effects of pet ownership on human health

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Abstract

To determine the impact of pet ownership on human health and well-being, a 10-month prospective study was carried out which investigated changes in behaviour and health status in 71 adult subjects following the acquisition of a new pet (either a dog or a cat). A non-matching control group of 26 subjects without pets served as a comparison over the same period. The control group exhibited no statistically significant changes in any health or lifestyle variable apart from a small increase in walking between the beginning and end of the study. In contrast, both pet-owning groups reported a highly significant reduction in minor health problems during the first month following pet acquisition, and this effect was sustained in dog owners until 10 months. The pet-owning groups also showed significant improvements in psychological well-being over the first six months and, in dog owners, this improvement was maintained until 10 months. In addition, dog owners underwent an improvement in self-esteem and were less afraid of being the victims of crime, 10 months after acquiring a dog. They also took considerably more physical exercise in the form of dog walking, and this effect continued throughout the period of study. The findings overall suggest that pet ownership can have a positive impact on human health and behaviour, and that in some cases these effects are relatively long lasting.

Introduction

Despite the publicity the subject has received in recent years, convincing evidence for a beneficial influence of pet ownership on human health remains scarce. Several studies have demonstrated, for example, transient decreases in heart rate and, or, blood pressure in experimental human subjects in the presence of pets (including aquarium fish), but so far none has provided evidence of sustained improvements in any physiological measure as the result of pet ownership (Friedmann and others 1979,1983, Katcher 1981, Katcher and others 1983). Even the widely cited study by Friedmann and others (1980), which appeared to show enhanced one-year survivorship in pet-owning coronary outpatients, has been criticized by Wright and Moore (1982), and, as yet, these studies have apparently not been replicated (Hart 1989).

The results of various cross-sectional comparisons between pet-owning and non-owning populations present an equally confusing picture. Some surveys have detected no apparent association between pet ownership and health status (Ory and Goldberg 1983, Robb and Stegman 1983, Lago and others 1989), while others have produced intriguing results that have, nevertheless, been difficult to interpret. At best, they suggest that if a person has a strong attachment for an animal, pet ownership may ameliorate the effects of traumatic events, such as bereavement, and have a positive impact on certain anxiety and depression indices (Akiyama and others 1987, Bolin 1987, Garrity and others 1989).

Only one previous study (Mugford and M'Comisky 1975) employed a longitudinal research design to explore the possible effects of pet ownership on the health of 'normal' (i.e., noninstitutionalised) human subjects, despite the accepted reliability of this method for testing the efficacy of new medical interventions, such as drugs or other forms of therapy. Mugford and M'Comisky compared three groups of elderly subjects before, and at intervals after, providing each of them with either cage birds, houseplants or no treatment (controls). Unfortunately, although the authors reported significant improvements in the pet-owning group's social and psychological condition over a five-month period, their results were based on very small sample sizes and dubious statistical manipulations (Beck and Katcher 1984).

The pilot study reported here employed a comparable research design to investigate some of the effects that pets have on their owners. In addition to measuring prospective changes in health and psychological well-being, the study also looked for changes in people's social interactions and relationships, physical exercise, and overall feelings of safety and security following the voluntary acquisition of a pet animal.

Materials and methods

Subjects

Seventy-one adult pet owners (47 dog owners and 24 cat owners) and a control group of 26 non-owners participated in the study. The majority of pet owners were recruited from persons seeking to acquire new pets from two local animal shelters. In order to maximize any effects of the new pet, dog owners who had owned a dog during the previous year, and cat owners who had owned either a cat or a dog within the same period were excluded from the study. To obtain an adequate sample of subjects during the narrow time interval between their decision to acquire a pet and its acquisition, no other selection criteria were imposed. A random or matching sample of persons without pets was also impossible to obtain in the time available, so control subjects were simply recruited via word-of-mouth. Only one person per household participated in the study. In pet-owning households, the person who had greatest day-to-day involvement in the care of the animal was chosen to participate. For a variety of reasons, nine dog owners and three cat owners dropped out during the period of study.

Questionnaires

At the beginning of the study, all subjects were interviewed in their homes and provided with self-report questionnaires. Pet owners were asked to complete and return their questionnaires preferably before or immediately after (within one or two days) taking their new pet home. At the outset, all subjects were informed that the purpose of the study was to 'explore the ways in which pets affect their owners'. The wording of this preamble was deliberately ambiguous so as to avoid biasing subjects' responses in either a positive or negative direction. In addition to obtaining basic personal and demographic details, the questionnaires contained the following items:

1. A self-report measure of total social contacts/interactions with friends and relatives during the previous two weeks.

2. A measure of subject's perceived safety/fear of crime during the previous 10 months.
3. A checklist of 20 minor health complaints suffered during the previous month.
4. A measure of the number and approximate duration of walks taken by the subject (other than walking to work, the shops, etc) during the previous two weeks.
5. A measure of the total number of hours subject had engaged in other energetic recreational activities during the previous two weeks

All subjects were also asked to complete a item General Health Questionnaire (Goldberg 1978) - a psychiatric screening test designed to measure psychological components of ill-health - the results of which were scored using simple Likert scales. Subjects also completed a 40 Culture-Free Self-Esteem Inventory (Battle 1981), which comprised four separate subscales: general self-esteem, social self-esteem, personal self-esteem, and a lie/defensiveness subscale.

All subjects completed similar questionnaires at the start of the study, and again after one, six and 10 months. The Culture-Free SEI and item 2 above were excluded from the one-month and six-month questionnaires. The General Health Questionnaire was excluded at one month.

At the end of the study, pet-owning subjects were asked to indicate whether the presence of the pet had or had not made any difference to their relationships with other people, and to describe what differences (if any) the pet had made. They were also asked to indicate whether the pet had made a major, minor, or little or no difference to their lives, and to describe the most important differences (if any) the animal had made.

Results

Initial differences between groups

The most important differences between the three groups at the beginning of the study are indicated in Table 1. It can be seen that the groups did not differ significantly from each other in terms of age, sex ratio, marital status, or type of housing (i.e., house vs. flat). Control subjects, however, had significantly fewer children on average than dog owners ($P = 0.0474$), belonged to somewhat higher socioeconomic groups than pet owners (dog and cat owners combined, $P = 0.0414$), and were less likely to have access to gardens ($P = 0.0056$). On a five-point scale ranging from 'less than one year' to 'more than 20 years', control subjects were found to have been resident in their area for significantly shorter periods of time than dog owners (Mann-Whitney U Test, $Z = -2.0464$, $P = 0.0407$). Additionally, dog owners took significantly more/longer walks per fortnight than cat owners ($Z = 2.297$, $P = 0.0216$). Further statistical comparisons revealed no other significant differences between the three groups at the beginning of the study.

Prospective changes within groups

No statistically significant changes in the number of social interactions with friends and relatives were reported over the 10-month period in any of the three groups. Similarly, the three groups

exhibited no change in the number of hours they engaged in energetic recreational activities (other than walking) over the period of study.

Neither cat owners nor controls experienced any significant change in their perceived safety/fear of crime over the 10-month period, judging from their scores on this item. Scores for dog owners, however, underwent a significant reduction between the beginning and the end of the study (Wilcoxon SR Test, $Z = -2.657$, $P = 0.008$), indicating that they perceived themselves to be safer/less afraid following the acquisition of a dog. This result is illustrated in Fig 1.

Members of the control group did not change significantly in the number of minor health problems they reported over the 10-month period.

Dog owners, on the contrary, reported a highly significant reduction in minor health problems (Wilcoxon SR Test, $Z = -4.19$, $P < 0.0001$) during the first month of the study, and this effect persisted both to six months ($Z = -3.894$, $P < 0.0001$) and to 10 months ($Z = -2.056$, $P = 0.02$). Cat owners also reported a significant reduction in minor health problems ($Z = -3.1977$, $P = 0.001$) during the first month, but this effect was no longer statistically significant by six months. The results are illustrated in Fig 2.

Changes in walk number/duration for each of the three groups are illustrated in Fig 3. Controls reported a small but significant increase in the number/duration of walks taken between the beginning of the study and 10 months ($Z = -2.06$, $P = 0.04$), but cat owners showed no significant changes in their scores. In contrast, dog owners displayed a dramatic increase in the number/duration of walks taken after the first month ($Z = -4.482$, $P < 0.0001$), and this increase was maintained both to six months ($Z = -4.585$, $P < 0.0001$) and 10 months ($Z = -4.837$, $P < 0.0001$).

The control group exhibited no significant change in their scores on the 30-item General Health Questionnaire over the period of study. Cat owners displayed a small reduction (i.e., improvement) in their scores during the first six months, although the result was only significant using a one-tailed probability estimate ($Z = -1.779$, $P = 0.0344$). This effect had disappeared by 10 months. Dog owners exhibited a highly significant improvement in their scores during the first six months after acquiring a pet ($Z = -3.442$, $P = 0.0006$), and some improvement was still apparent after 10 months ($Z = -2.467$, $P = 0.0138$). These trends are illustrated in Fig 4.

None of the three groups exhibited any significant change on any of the four subscales of the Culture Free SEI during the period of study (Fig 5). The control group and the cat owners also displayed no change in total self-esteem (the sum of the subscale scores, excluding the lie/defensiveness subscale). Dog owners, however, exhibited small but significant improvement in their total self-esteem ratings between the beginning and the end of the study ($Z = -2.078$, $P = 0.0384$).

Effects on owners' social relationships and lives

The results of the final questions about the effects of pets on their owners' social relationships and lives are given in Tables 2 and 3. In response to the question concerning whether the animals had made any differences to their social relationships, a roughly equal proportion of cat owners and dog owners felt that the animal had made a difference (46 and 40 per cent, respectively). The vast

majority of these reported positive effects on their social relationships/ interactions with other people, especially other members of the household.

In response to the question concerning the impact of the pets on their lives, however, certain differences emerged between dog and cat owners. Fifty per cent of dog owners believed that the pets had made a major difference to their lives, and they ranked increased exercise and increased companionship as the two most important differences. By comparison, only 37 per cent of cat owners felt that the animals had made a major difference to their lives, and they ranked increased companionship and increased responsibility/tie (a negative effect) as most important.

Discussion

The results of the present study suggest that the positive effects of pet ownership on people's health, behaviour and general well-being may be more significant than previously recognized. Both the dog owners and cat owners who participated in this study reported a reduction in minor health problems (of the order of 50 per cent) during the first month following the acquisition of a pet. In dog owners, health effects were maintained for the full 10-month period of the study. Both groups also demonstrated improvements in psychological well-being (as measured by the 30 item General Health Questionnaire) after the first six months, an effect which persisted in dog owners until the end of the study.

In every case, dog owners reported stronger and more durable effects of pet ownership than cat owners. In addition to the findings mentioned above, dog owners experienced a significant reduction in their fear of being the victims of crime following the acquisition of a dog. Although not surprising, given the protective/territorial behaviour of dogs, this result may help to explain the recent and somewhat alarming proliferation of large guard dogs in the United Kingdom (Council for Science and Society 1988). Dog owners also displayed a small improvement in self-esteem. Several authors have postulated that pet ownership may have beneficial effects on an owner's self-esteem (Levinson 1972, Mugford 1980), but the present findings provide the first convincing evidence that such effects may be relatively long term, at least among dog owners.

The dog owners in this study also experienced a dramatic and sustained increase in physical exercise as a result of walking their dogs. Before acquiring a dog, these subjects were walking on average for slightly more than one hour per week (significantly more than cat owners). Within a month this figure had risen to over four hours, and by the end of the study it had reached the equivalent of five hours walking per week. Although no discernible statistical association was found between the number of minor health problems reported and the number/duration of walks taken at either the beginning or end of the study, such a substantial increase in daily physical exercise would be likely to have a beneficial impact on health. For example, two recent studies have demonstrated reduced incidence of hip fractures among the elderly as a result of regular daily exercise such as walking (Cooper and others 1988, Lau and others 1988, Hardman and others 1989) have shown significant beneficial changes in high density lipoprotein cholesterol concentrations in middle-aged women who were persuaded to walk between two and three hours per week. It should be noted that the control group also reported a small increase in walking between the beginning and the end of the study. This result was probably due to a seasonal effect

because the bulk of the control subjects received their third and fourth questionnaires during the summer months, somewhat later than either the cat owners or dog owners.

Although the results presented here show an apparent influence of pet ownership on human health and emotional state, they provide few clues to the mechanisms responsible for these effects. Several hypothetical explanations may, nevertheless, be proposed:

Novelty - The fact that the effects of pet ownership are strongest during the first month and appear to decline thereafter suggests that some of the changes may be due to the novelty value of introducing animals into households and families. This, however, raises interesting questions about the peculiarly diverting qualities of companion animals, and fails to explain why these effects should persist, in some cases, for as long as 10 months after pet acquisition.

Placebo effect - Despite the shortage of convincing evidence, the putative health benefits of pet ownership have received a certain amount of media coverage in recent years, including articles in many major newspapers. As a result of exposure to this kind of material, pet-owning subjects may have expected benefits and, consequently, felt better and biased their responses in the appropriate direction. The differences between dog and cat owners observed in this study would tend, however, to argue against the possibility of a placebo effect, because subjects would have no a priori reason for assuming that cat ownership would be less beneficial than dog ownership. The relatively long intervals of time between successive questionnaires (one month, five months and four months, respectively) would also tend to reduce the likelihood of bias, because subjects retained no record of their responses to previous questionnaires.

Company - Companion animals may affect their owner's psychoimmune status by providing companionship and social support. House and others (1988) have recently re-emphasized the importance of social support and positive social interaction as protective factors against both emotional and physical ill health. Elsewhere it has been suggested that, as sources of uncritical and unconditional affection, pet animals approximate many of the positive aspects of human companionship, and may therefore contribute in similar ways to their owners' health and well-being (Serpell 1986, 1989). This hypothesis is borne out by the fact that the majority of pet owners ranked 'increased companionship' as the most important difference their pets had made to their lives. It would also go some way towards explaining why dog ownership produces stronger and more lasting effects than cat ownership, since dogs habitually solicit more attention from their owners than cats do (Serpell 1986).

Social catalyst - Companion animals may have indirect effects on their owners' psychoimmun status by improving their social interactions and relationships in general. Messent (1983) has shown that dog owners experience higher rates of positive social interaction when walking their dogs than solitary walkers, and abundant anecdotal evidence suggests that dogs can act as potent social catalysts for their owners (Serpell 1986). Although in the present study there were no differences between the three study groups in the frequency of their social contacts with friends or relatives, substantial numbers of pet owners did report that the pet had had a positive effect on their relationships with other people, particularly other members of the household. Judging from people's comments, it appeared that the pet often acted as a focus for conversation and communication between members of the family. To quote several subjects, 'It gives us something

to talk about'. This particular form of social enhancement induced by pets is rarely discussed in the literature and would repay more detailed investigation.

According to recent estimates, there are now some 7-4 million pet dogs and 6-9 million cats in the United Kingdom (PFMA 1990). Unlike the majority of domestic animals, pets make relatively little economic contribution to their owners' lives, and some are costly to maintain (Council for Science and Society 1988). Despite these apparent drawbacks, the pet population of the western world is continuing to rise. The results of this pilot study provide some tentative explanations for the growing popularity of these animals. Ideally, it would be valuable to extend the research to include a much larger sample of both owners and non-owners so as to elucidate the possible effects of age, sex and other sociodemographic factors.

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References

1. AKTYAMA, H., HOLIZMAN, J. M. & BRTTZ, W. E. (1987). Pet ownership and health status during bereavement. *Omega: Journal of Death and Dying* 17, 187-193.
2. BATTLE, J. (1981). Culture-Free SEI: Self-esteem Inventories for Children and Adults. Special Child Publications, Seattle, WA
3. BECK, A. M. & KATCHER, A. H. (1984). A new look at pet-facilitated psychotherapy. *Journal of the American Veterinary Medical Association* 184, 414-421.
4. BOLIN, S. E. (1987). The effects of companion animals during conjugal bereavement. *Anthrozoos* 1(1), 26-35.
5. COOPER, C., BARKER, D. J. P. & WICKHAM, C. (1988). Physical activity, muscle strength, and calcium intake in fracture of the proximal femur in Britain. *British Medical Journal* 297, 1443-1446.
6. COUNCIL FOR SCIENCE AND SOCIETY (1988). Companion Animals in Society. Oxford University Press, Oxford.
7. 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.

8. FRIEDMANN, E., KATCHER, A. H., MEISLICH, D. & GOODMAN, M. (1979) Physiological response of people to petting their pet (Abstract). *American Zoologist* 19, 327.
9. FRIEDMANN, E., KATCHER, A. H., THOMAS, S. A., LYNCH, J. J. & MESSENT, P. R. (1983) Social interaction and blood pressure: influence of animal companions. *Journal of Nervous and Mental Disease* 171, 461-465.
10. GARRITY, T. F., STALLONES, L., MARX, M. B. & JOHNSON, T. P. (1989). Pet ownership and attachment as supportive factors in the health of the elderly. *Anthrozoos* 3(1), 35-44.
11. GOLDBERG, D. (1978) Manual of the General Health Questionnaire. NFER-Nelson, Windsor.
12. HARDMAN, A., HUDSON, A., JONES, R R. M. & NORGAN, N. G. (1989) Brisk walking and plasma high density lipoprotein cholesterol concentration in previously sedentary women. *British Medical Journal* 299, 1204-1205.
13. HART, L. A. (1989). What pets contribute to health, and communicating that to your clients. *Journal of the Royal Netherlands Veterinary Association* 114, 70S-75S.
14. HOUSE, J. S., LANDIS, K. R. & UMBERSON, D. (1988) Social relationships and health. *Science* 241, 540-545.
15. KATCHER, A. H. (1981) Interactions between people and their pets: form and function. In *Interrelations between People and Pets*. Ed B. Fogle. Charles C. Thomas, Springfield, Illinois. pp 41-67.
16. KATCHER, A. H., FRIEDMANN, E., BECK, A. M. & LYNCH, J. J. (1983) Talking, looking, and blood pressure: physiological consequences of interaction with the living environment. In *New Perspectives on Our Lives with Companion Animals*. Eds. A. H. Katcher and A. M. Beck, University of Pennsylvania Press, Philadelphia, pp 351-359.
17. LAGO, D., DELANEY, M., MILLER, M. & GRILL, C. (1989) Companion animals, attitudes towards pets, and health outcomes among the elderly: a long-term follow-up. *Anthrozoos* 3(1), 25 -34.
18. LAU, E., DONNAN, S., BARKER, D. J. P. & COOPER, C. (1988) Physical activity and calcium intake in fracture of the proximal femur in Hong Kong. *British Medical Journal* 297, 1441-1443.
19. LEVINSON, B. M. (1972) *Pets and Human Development*. Charles C. Thomas, Springfield, Illinois.
20. MESSENT, R. R. (1983) Social facilitation of contact with other people by pet dogs. In *New Perspectives on Our Lives with Companion Animals*. Eds. A. H. Katcher and A. M. Beck, University of Pennsylvania Press, Philadelphia, pp 37-46.

21. MUGFORD, R. A. (1980) The social significance of pet ownership. In *Ethology and Nonverbal Communication in Mental Health*. Eds. S. A. Corson and E. O'Leary Corson, Pergamon Press, Oxford, pp 111-122.
22. MUGFORD, R. A. & M'COMISKY, J. G. (1975) Therapeutic value of cage birds with old people. In *Pet Animals and Society*. Ed R. S. Anderson. Bailliere Tindall, London, pp 54-65.
23. ORY, M. G. & GOLDBERG, E. L. (1983) Pet possession and life satisfaction in elderly women. In *New Perspectives on Our Lives with Companion Animals*. Eds. A. H. Katcher and A. M. Beck. University of Pennsylvania Press, Philadelphia, pp 303-317.
24. PFMA (1990). Profile 1990. Pet Food Manufacturers' Association, London, p 2.
25. ROBB, S. S. & STEGMAN, C. E. (1983) Companion animals and elderly people: a challenge for evaluators of social support. *Gerontologist* 23, 277-282.
26. SERPELL, J. A. (1986) *In the Company of Animals*. Basil Blackwell, Oxford.
27. SERPELL, J. A. (1989) Humans, animals, and the limits of friendship. In *The Dialectics of Friendship*. Eds. R. A. Porter and S. Tomaselli. Routledge, London, pp 111-129.
28. WRIGHT, J. C. & MOORE, D. (1982) Comments on animal companions and one-year survival of patients after discharge. *Public Health Reports* 97, 380-381.

Table 1. Demographic Characteristics of Sample populations

	Controls	Cat Owners	Dog Owners	Significant Differences
Age (mean)	40.5	34.3	38.6	NS
Sex ratio (male/female)	2/24	2/22	4/43	NS
Marital status: M/S	20/6	17/7	39/8	NS
Numbers of children (mean)	0.92	0.96	1.49	Unpaired Test controls with dog owners t=-2.018, P=0.0474
Average socioeconomic group	4.77	6.33	6.23	Mann-Whitney U Test: controls with pet owners Z=-2.048, P=0.0414
Ratio house/flat	21/5	21/3	46/1	NS
Ratio with/without garden	21/5	24/0	46/1	Total X ² =10.381, P=0.0056

Table 2. Effect of pets on owners' social relationships

Q. Do you think that this pet has made any difference to your relationships with other people?			
		Dog owners	Cat owners
	Yes	19	11
	No	13	9
	Don't know	14	4
Q. What differences (if any) has it made?			
	Main differences reported	Dog owners	Cat owners
	Increased social interaction (especially within household)	18	10
	Reduced social interaction	1	1

Table 3. Effect of pets on owners' lives (NB some owners reported more than one important difference)

Q. Would you say that this pet has made a major difference, a minor difference, or little or no difference to your life?			
	Dog owners	Cat owners	
Major	23	9	
Minor	14	11	
Little or No	1	2	
No reply	9	2	
Q. What are the most important differences it has made?			
Main differences reported	Dog owners	Cat owners	
Increased companionship and affection	18	7	
Increased exercise	14	0	
Increased social interaction	5	2	
Increased tie/responsibility	5	2	
Good for child (ren)	4	4	
Increased safety	4	0	
Felt calmer/more relaxed	0	4	
Miscellaneous	9	3	