Stressful Life Events and Use of Physician Services Among the Elderly: The Moderating Role of Pet Ownership

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The physician utilization behavior of 938 Medicare enrollees in a health maintenance organization was prospectively followed for 1 year. With demographic characteristics and health status at baseline controlled for, respondents who owned pets reported fewer doctor contacts over the 1-year period than respondents who did not own pets. Furthermore, pets seemed to help their owners in times of stress. The accumulation of prebaseline stressful life events was associated with increased doctor contacts during the study year for respondents without pets. This relationship did not emerge for pet owners. Owners of dogs, in particular, were buffered from the impact of stressful life events on physician utilization. Additional analyses showed that dog owners in comparison to owners of other pets spent more time with their pets and felt that their pets were more important to them. Thus, dogs more than other pets provided their owners with companionship and an object of attachment.

Current and projected demand by the elderly for health care services has prompted the study of their physician utilization behavior. These studies and others show that factors in addition to physical health status influence decisions to use medical services. Psychological distress, for example, has been positively associated with the frequency of primary care physician visits among the general population (Barsky, Wyshak, & Klerman, 1986; Regier, Goldberg, & Taube, 1979; Shuval, 1970; Tessler, Mechanic, & Dimond, 1976) and among the elderly (Waxman, Carner, & Blum, 1982). Stressful life events also contribute to higher utilization rates (Rahe & Arthur, 1978) because stressful events are intertwined with psychological distress and because persons undergoing stress pay greater attention to bodily symptoms as well as find them more disturbing (Mechanic, 1972). One of the most distressing life events, death of a spouse, occurs with greatest frequency in older populations. Major events, such as spousal loss, are frequently identified as precipitating factors in loneliness (Perlman & Peplau, 1984), another potential determinant of physician utilization. In light of these notions, it is reasonable to hypothesize that circumstances that promote well-being or alleviate distress or both could reduce the need for physician contact. One such circumstance is pet ownership, as pets have been reported to

provide companionship, an aid to health and relaxation, protection, and nonjudgmental acceptance and love (Soares, 1985).

A rich anecdotal lore exists in support of pets as companions to the elderly, although methodologically strong empirical studies are few. Observational studies suggest that introducing pets into the lives of terminal cancer patients (Muschel, 1984) or the lives of patients in a geriatric ward (Brickel, 1986) brings about significant positive social and psychological consequences. Bird placement among British pensioners led to positive psychosocial effects in comparison with pensioners who received a plant (Mugford & M'Comisky, 1975). However, at least one evaluation of a companion animal program failed to show positive gains for those who acquired pets relative to a comparison group (Lago, Connell, & Knight, 1983); among pet owners, though, affection for pets was positively related to morale.

With regard to naturally occurring pet ownership, one study (Robb & Stegman, 1983) found no physical benefit and three studies found no psychological benefit (Lawton, Moss, & Moles, 1984; Ory & Goldberg, 1983; Robb & Stegman, 1983) of pet ownership among the elderly. This is in contrast to dramatic findings that identified pet ownership as a strong social predictor of 1-year survival in a group of postcoronary patients (Friedmann, Katcher, Lynch, & Thomas, 1980). Also supportive of the value of pets are data from a national probability sample of respondents 65 years or older that showed that pet attachment was inversely related to depression as measured by a symptom scale (Garrity, Stallones, Marx, & Johnson, 1989). Furthermore, Garrity et al. found that pet attachment was associated with better physical health, as assessed by retrospective reports of recent illness experiences, among respondents with low levels of human support but not among those with adequate human support. These data suggest that pet ownership or attachment or both might play a beneficial role in times of stress. Similarly, data on human social relationships indicate that these relation-

ships can buffer the impact of a variety of stresses and strains such that individuals experiencing high stress and high social support will not evidence compromised physical or psychological health (Broadhead et al., 1983).

This study prospectively examined the direct and indirect effects of pet ownership on utilization behavior of the elderly. Specifically, I hypothesized that with demographic and health characteristics controlled for, pet owners would report fewer doctor contacts than nonowners. I also hypothesized that in periods of high stress, pet owners would report fewer doctor contacts than nonowners. I did not anticipate a relationship between pet ownership and doctor contacts among respondents in low-stress circumstances. In this study, stress was operationalized in two ways: depressive symptomatology and accumulation of stressful life events.

Method

Sample

The data for the present investigation were collected as part of a 1-year panel study concerned with health behavior of the elderly. All respondents were enrolled through Medicare in a federally qualified network model health maintenance organization (HMO) located in southern California. At study onset, approximately 2,900 members in the HMO were enrolled through Medicare. After eliminating one member of spouse pairs from the sampling frame, study solicitations and consent forms were mailed to approximately 2,300 potential participants. Signed consent forms were returned by 1,145 enrollees. Data collected earlier by the HMO permitted a comparison of enrollees who returned the consent forms and those who did not. The two groups were comparable in age, gender composition, marital status, and self-reports of depressed mood. However, the respondent group differed from the nonrespondents in terms of greater representation of non-Hispanic Whites, high school graduates or above, and good or excellent health status.

Interviews were conducted by telephone unless poor hearing or other impairment on the part of the respondent interfered. In these instances, interviews were conducted face to face. In total, 1,034 respondents 65 years of age and older were interviewed at baseline (58 interviews were conducted face to face). Among the 1,145 potential respondents, attrition was due primarily to death, severe illness, relocation, refusal by another family member, or reported age of less than 65 years. The baseline questionnaire assessed health status, health beliefs, psychological distress, social network and support, pet ownership, and demographic characteristics.

Every 2 months for the 12-month period following the baseline interview, respondents were reinterviewed concerning doctor contacts that had occurred since the prior interview. The measures of psychological distress were repeated at Wave 4 (6 months) and at Wave 7 (12 months). For pet owners, information on the nature of their relationship with their pets was collected at Wave 2.

Measures

At baseline, respondents reported whether they had "any chronic, that is, recurring or continuing health problems," provided data on their demographic characteristics, and answered questions concerning the extensiveness of their social network. Demographic characteristics assessed were gender, age, racial-ethnic group, income, education, marital status, employment status, and current living arrangement. Included among the questions on living arrangement was one asking whether there were any pets in the household and, if so, of what type(s).

Social network involvement was assessed by the 10-item Lubben Social Network Scale (LSNS; Lubben, 1988), developed for gerontological research. This scale has three components: family networks (items are "number seen monthly," "frequency of social contact," "number respondent feels 'close to' "), friendship networks ("number seen monthly," "frequency of social contact," "number feels 'close to' "), and interdependent social supports ("has a confidant," "is a confidant," "relies upon and helps others," "living arrangement"). A total LSNS score is achieved by summing the 10 items, each of which ranges in value from 0 (*least connected*) to 5 (*most connected*). Criterion-based validity and internal consistency are adequate (Lubben, 1988).

At baseline, at 6 months, and at the final interview (12 months), depressed mood was measured by the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). The CES-D uses 4-point scales (scored 0 to 3) to assess the frequency with which each of the 20 symptoms was experienced during the previous week. Several epidemiologic studies (Comstock & Helsing, 1976; Frerichs, Aneshensel, & Clark, 1981; Husaini, Neff, Harrington, Hughes, & Stone, 1980) found the scale sensitive to differences in level of depressed mood. The CES-D has adequate validity (content, criterion-based, and construct) and reliability (test–retest and internal consistency; Radloff, 1977; Weissman, Sholomskas, Pottenger, Prusoff, & Locke, 1977) and has been used previously with aged populations (Berkman et al., 1986; Garrity et al., 1989; Murrell, Himmelfarb, & Wright, 1983).

The measure of life events, administered at baseline 6 months, and 12 months, was a combination of checklists developed for gerontological populations (Amster & Krauss, 1974; Kahana & Kahana, 1983; Lubben, 1984). Respondents indicated whether any of the following 10 events had occurred to them in the preceding 6 months: separation or divorce, death of close family member, major illness of spouse, job retirement, death of close friend, move, being a victim of crime, relative being a victim of crime, being denied a driver's license, and money problems.

Use of physician services was assessed every 2 months (at Waves 2 through 7) and aggregated across the waves. The respondents were asked how many times they had contacted the doctor since the last interview. Respondents reporting at least one contact were asked how many times they specifically requested to see the doctor and how many times the doctor specifically requested to see them.

Respondents identifying themselves at Wave 1 as pet owners were asked a series of questions at Wave 2 about their pets. Respondents having more than one pet were asked, "Which one of your pets is your favorite one? That is, the one to whom you are the closest or give the most attention?" All subsequent questions referred to the respondents' favorite pet (or only pet).

Four aspects of the human/pet relationship were assessed: responsibility, time with pet, affective attachment to pet, and benefit minus cost difference. Two questions assessed responsibility: Whose decision was it to get the pet? and Who is most responsible for the care and feeding, including trips to the veterinarian? Responses were categorized as respondent alone, respondent and another person, or someone else alone.

Questions relevant to time spent with the pet asked for the following information: how much of the time the respondent and pet were in the same room when the respondent was at home (categories of *almost never or a little, some,* and *most or all of the time*); hours per day spent outdoors with pet; hours per day petting pet; hours per day talking to pet; and amount of time spent with pet compared to other people respondent knew with pets (categories of *much less or a little less, about the same,* and *a little more or much more*).

Affective attachment was measured by a single question with five response alternatives: "And, would you say your pet is: extremely important to you; very important to you; fairly important; not too important to you; or not at all important to you?" Last, respondents were

Table 1
Demographic and Health Characteristics of
Medicare Enrollees in an HMO

Variable	%	n
Sex		
Male	40	379
Female	60	559
Age		
65 to 74	69	650
75 and older	31	288
Racial-ethnic group		
Non-Hispanic White	89	836
Other	11	102
Income before taxes		
Less than $15,000	50	466
Greater than $15,000	39	368
Missing data	11	104
Education		
12 years or less	62	578
13 yers or more	38	360
Marital status		
Not married	56	522
Married	44	416
Employment status		
Not employed	84	786
Employed	16	152
Living arrangement		
Lives alone	41	383
Lives with others	58	545
Missing data	1	10
Pet ownership		
No pet in household	63	593
Pet in household	37	345
Chronic health conditions		
None	43	402
One or more	57	536

Note. HMO = health maintenance organization. $N = 938$.

asked about the benefits of owning a pet and the negative aspects of owning a pet. These were open-ended questions that were subsequently coded into categories by the investigators. The benefit minus cost difference was determined by subtracting the number of negative categories mentioned from the number of positive categories.

Results

Of the 1,036 respondents assessed at baseline, 938 (91%) remained in the final sample. Respondents were excluded if they missed more than one interview in Waves 2 through 4 or in Waves 5 through 7. Stated differently, respondents could miss a maximum of one interview in the first 6 months of the study and one in the second 6 months and still be included in the final sample. An examination of the baseline characteristics showed that respondents in the final sample were younger and more likely to be employed than those who dropped out of the study. The two groups were comparable in presence of chronic health problems, gender composition, income, racial-ethnic composition, education, living arrangement, presence of pets in the household, social network involvement, depressive symptomatology, and the experience of recent life events.

The demographic characteristics of the respondents are presented in Table 1. For purposes of analyses, all demographic variables were collapsed and treated as dichotomous. As can be seen, two thirds of the sample was between ages 65 and 74 years, with one third of the respondents being 75 years and older. A greater proportion of the sample was female (60%) than male (40%), and the majority classified themselves as non-Hispanic White (89%). Half had incomes below $15,000, and two thirds had a high school education or less. Most (84%) were presently not working. Although more than half (56%) of the respondents currently were not married, the majority (58%) shared their households with someone. One third (37%) of the respondents had household pets, a proportion comparable to that in two other studies of the elderly (Garrity et al., 1989; Ory & Goldberg, 1983), and more than half (57%) had one or more chronic health problems.

To examine the prospective relationship of baseline characteristics with utilization of services, the data on doctor contacts were aggregated across the six waves (Waves 2 through 7). Each respondent received a total doctor contacts score for the study year and subscores of respondent-initiated contacts and physician-initiated contacts. Respondents who missed one interview in either Waves 2 through 4 (Months 2, 4, 6) or Waves 5 through 7 (Months 8, 10, 12) or both were assigned for the wave they missed the average value of contacts in the other two waves in the 6-month period.

The three measures of doctor contacts were each regressed on the baseline measures. A hierarchical procedure was followed, with demographic variables (sex, age, race, education, income, employment status, social network score, and chronic health problems) entered on the first step and pet ownership entered on the second step. This analysis tested whether pet ownership accounted for a significant proportion of the variance in doctor contacts once the variance attributable to other demographic characteristics had been removed. After demographics and health status were controlled for, respondents with pets had fewer total doctor contacts ($\beta = -.07$, $p < .05$) and respondent-initiated contacts ($\beta = -.07$, $p < .05$) than those without pets. The two groups were comparable with regard to doctor-initiated contacts over the 1-year period. Not surprisingly, the presence of chronic health problems was related to higher scores on all three contact measures, as was lower income. Men reported more respondent-initiated contacts than women. In sum, health status, income, and pet ownership were the major demographic predictors of doctor contacts over a 1-year period.

The second step in the analyses was to determine whether pet ownership might moderate the impact of psychological distress on doctor contacts. The previous regressions were repeated with the following revisions. Life events and depression at baseline were included as predictor variables, and both the Life Event × Pet Ownership interaction term and the Depression × Pet Ownership interaction term were entered on a third step in the regression analysis. With regard to total doctor contacts, poor health ($\beta = .19$, $p < .0001$), lower income ($\beta = -.11$, $p < .01$), the experience of a greater number of life events in the previous 6 months ($\beta = .15$, $p < .001$), and the Pet Ownership × Life Events interaction term ($\beta = -.11$, $p < .05$) each made a significant independent contribution to the regression equation. The full model is presented in Table 2. To clarify the direction of the interaction effect, the mean doctor contacts

Table 2

Demographic Variables, Stressful Life Events, and Pet Ownership as Predictors of Utilization of Physician Services

Variable	β	SE	p
Sex (1 = female)	−.07	.58	—
Age (1 = 75 years or more)	.02	.62	—
Ethnic group (1 = non-Hispanic White)	.00	.87	—
Chronic health problems (1 = 1 or more)	.19	.57	.0001
Employment status (1 = employed)	−.04	.75	—
Education (1 = high school graduate/beyond)	−.03	.57	—
Social network involvement (possible range from 0 to 49)	.07	.03	—
Income (1 = $15,000 or greater)	−.11	.59	.01
Life events (possible range from 0 to 10)	.15	.37	.001
Pet ownership (1 = pet)	−.03	.84	—
Depression (possible range from 0 to 60)	.08	.05	—
Life events × Pet Ownership	−.11	.63	.05
Depression × Pet Ownership	.05	.07	—

were calculated within the four cells of the pet ownership by life events (split at the median) cross-classification. The pattern of means and tests of simple main effects support the hypothesis that pet ownership moderates the impact of life events on doctor contacts. Specifically, for respondents without a pet, the experience of many compared to few life events in the 6 months prior to baseline resulted in significantly more total doctor contacts during the study year (10.37 vs. 8.38, $p < .005$). Life events were unrelated to doctor visits among respondents with a pet (8.91 contacts for those with many life events and 7.90 for those with few life events, *ns*).

Parallel findings emerged for the two subscores of doctor contacts. For respondent-initiated contacts, being male ($\beta = -.11$, $p < .01$), being in poor health ($\beta = .17$, $p < .001$), and having many life events ($\beta = .13$, $p < .01$) each independently predicted contacts. Poorer health ($\beta = .14$, $p < .001$) and many life events ($\beta = .09$, $p < .05$) predicted doctor-initiated contacts. Although the Pet Ownership × Life Events interaction was not statistically significant ($\beta = -.08$, $p = .13$ for respondent-initiated contacts; $\beta = -.09$, $p < .07$ for doctor-initiated contacts), the pattern of means supported the finding that doctor contacts increased as life events accumulated for nonowners, but not for pet owners.

The final set of regressions classified pet owners by type of pet. Thus, the pet ownership variable in the first set of analyses was cat owners ($n = 141$) compared with nonowners, then dog owners ($n = 202$) compared with nonowners, and then bird owners ($n = 45$) compared with nonowners. There were too few fish owners or owners of other pets to be analyzed separately. (It should be noted that the sum of these subgroups totals more than the number of respondents with pets because some respondents had more than one type of pet.) These analyses showed that the Life Events × Pet Ownership interaction term was a significant predictor of doctor contacts (total, $p < .05$, and respondent-initiated, $p < .05$) for dog owners, but not for either

cat or bird owners. Specifically, for respondents not owning a dog, doctor contacts increased as life events increased (10.39 compared to 8.37, $p < .01$, for high and low life events, respectively). Total doctor contacts for the study year were 8.62 and 7.75 (*ns*) for dog owners reporting high and low life events, respectively. With regard to respondent-initiated contacts, respondents not owning a dog and reporting many life events had more contacts than those with few life events (5.14 compared to 3.96, $p < .001$). Among dog owners, life events were unrelated to respondent-initiated doctor contacts (3.73 and 3.77, *ns*).

To explore the stress reduction aspects of dog ownership, dog owners ($n = 201$) were compared with pet owners who did not have a dog ($n = 110$) concerning their reported relationship with their pet. (Note that these analyses were for 201 rather than 202 dog owners because 1 dog owner answered the questions with regard to another type of "favorite" pet.) First, concerning time spent with their pets, dog owners relative to owners of other pets spent more time outdoors with their pets (1.43 hr per day vs. 0.59 hr per day), $t(282) = 4.96$, $p < .001$; spent more time talking to their pets (1.48 hr per day vs. 1.14 hr per day), $t(288) = 1.93$, $p < .05$; and felt that, overall, they spent more time with their pets than other people they knew with pets, $t(297) = 3.26$, $p < .001$. Dog owners felt more attached to their pets, $t(309) = 3.30$, $p < .001$, and showed a larger difference score for the positive minus negative aspects of pet ownership, $t(303) = 2.47$, $p < .01$, than did owners of other pets. Furthermore, analyses of the specific positive and negative aspects of pet ownership indicated that dog owners were more likely than owners of pets other than dogs to mention that their pets make them feel secure, $\chi^2(1, N = 307) = 51.67$, $p < .0001$, and slightly more likely to mention that their pets provide love, $\chi^2(1, N = 307) = 3.13$, $p < .08$. Owners of pets other than dogs were more likely than dog owners to mention that their pets provide cheer or entertainment, $\chi^2(1, N = 307) = 4.97$, $p < .05$. No differences as a function of type of pet emerged in the frequency of citing specific negative aspects of pet ownership.

Discussion

This 1-year prospective study suggests that pet ownership influences the physician utilization behavior of the elderly. When sex, age, race, education, income, employment status, social network involvement, and chronic health problems were controlled for, respondents with pets reported fewer doctor contacts during the year than those without pets. This effect was particularly pronounced for respondent-initiated doctor contacts, suggesting that discretionary contacts were influenced more than physician-initiated contacts. Furthermore, pets seemed to help their owners in times of stress. The accumulation of stressful life events was associated with increased doctor contacts for respondents without pets; however, this relationship did not emerge for pet owners. Again, these analyses controlled for respondents' health status, depressed mood, and other demographic characteristics. Depressed mood was not itself a predictor of doctor contacts, nor did it interact with pet ownership. Additional analyses indicated that the physician utilization behavior of dog owners alone was unaffected by the accumulation of stressful life events.

An examination of the specific stressful events that were en-

dorsed by this elderly population showed that those occurring most frequently were loss events. About one quarter of the sample (26%) had experienced the death of a close friend in the 6 months preceding the baseline interview. The death of a close family member and major illness of respondent's spouse were each reported by 13% of the sample, and the remaining seven events were endorsed by less than 10% of the respondents. Thus, a recent loss of companionship was common.

Respondent-generated benefits of pet ownership (open-ended question) indicated that fully three quarters of the pet owners mentioned that their pet provided them with companionship or company. Feelings of security (25%) and feeling loved (21%) were the next most frequently cited benefits. Taken together, these data suggest that life events may be arousing needs for companionship that in turn may result in doctor contacts. This may occur because either doctor contacts satisfy the desire for companionship or the companionship loss is exacerbating other health concerns. For pet owners, however, it seems that their companionship needs are met partially by their pets. Therefore, pet owners do not show an increase in physician utilization with increasing life events.

Regarding type of pet, the data showed that owning a dog provided a stress buffer, whereas owning other types of pets did not. Apparently, dog owners have a qualitatively different relationship with their pets than do owners of other pets. Dog owners reported spending more time outdoors and talking with their pets than other pet owners in this sample and felt that, in comparison to others they knew with pets, they spent more time with their pets overall. Both talking and time outdoors have clear companionship functions. In addition, spending time outdoors might be either a contributor to or a consequence of increased physical or mental vigor, which could in turn be related to physician contacts. The analyses controlled for chronic health problems and depressed mood, however, which suggests that the benefits of dog ownership are not mediated solely via the greater activity level of the owners. Although the presence of chronic health problems is a crude measure of health status, these findings were replicated when another measure of health (self-rated health status) was substituted for chronic health problems.

Probably of greater importance than the data on time spent with the pet are the data indicating that dog owners felt more attached to their pets than did other owners. Two studies of the elderly found that greater attachment to one's pet was associated with better mental health (Garrity et al., 1989; Ory & Goldberg, 1983), and attachment was associated with better physical health when human companionship was inadequate (Garrity et al., 1989). Moreover, a survey of elderly persons yielded reports of greater pet involvement if the pet was a dog than a cat (Lago, Knight, & Connell, 1983). Also, 50% of the dog owners said they spent 24 hr a day with their dogs, compared to 7% of the cat owners (Lago et al., 1983). Finally, dog owners in the current study felt that the benefits of owning a pet outweighed the costs to a greater degree than did owners of other pets. Particularly salient among the benefits was security —provided much more by dogs than other pets. A sense of security may be especially important to the urban elderly who constituted our sample.

Altogether, these data indicate that owning a pet, particu-

larly a dog, may reduce the demand for physician services among the elderly. As all analyses controlled for health status, it appears that pet ownership is primarily influencing social and psychological processes rather than physical health. Indeed, records of physician utilization behavior are thought to reflect the individual's social as well as medical history. Further support for this notion comes from data indicating that pet ownership reduces demand for care in times of stress. This latter finding is consistent with the growing literature on the role of social support in buffering the potentially negative consequences of stressful life events (Cohen & Wills, 1985; Kessler & McLeod, 1985). It has been observed that only those social relationships that provide appropriate forms of support can act as effective buffers (Cohen & McKay, 1984). Accordingly, dogs more than other pets provided their owners with companionship and with an object of attachment.

References

Amster, L. E., & Krauss, H. H. (1974). The relationship between life crisis and mental deterioration in old age. *International Journal of Aging and Human Development, 5,* 51–55.

Barsky, A. J., Wyshak, G., & Klerman, G. L. (1986). Medical and psychiatric determinants of outpatient medical utilization. *Medical Care, 24,* 548–560.

Berkman, L. F., Berkman, C. S., Kasl, S., Freeman, D. H., Jr., Leo, L., Ostfeld, A. M., Cornoni-Huntley, J., & Brody, J. A. (1986). Depressive symptoms in relation to physical health and functioning in the elderly. *American Journal of Epidemiology, 124,* 372–388.

Brickel, C. M. (1986). The therapeutic roles of cat mascots with a hospital-based geriatric population: A staff survey. *Gerontologist, 19,* 368–372.

Broadhead, W. E., Kaplan, B. H., James, S. A., Wagner, E. H., Schoenbach, V. I., Grimson, R., Heyden, S., Tibblin, G., & Gehlbach, S. H. (1983). The epidemiologic evidence for a relationship between social support and health. *American Journal of Epidemiology, 117,* 521–537.

Cohen, S., & McKay, G. (1984). Social support, stress, and the buffering hypothesis: A theoretical analysis. In A. Baum, J. E. Singer, & S. E. Taylor (Eds.), *Handbook of psychology and health* (Vol. 4, pp. 253–267). Hillsdale, NJ: Erlbaum.

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98,* 310–357.

Comstock, G. W., & Helsing, K. J. (1976). Symptoms of depression in two communities. *Psychological Medicine, 6,* 551–553.

Frerichs, R. S., Aneshensel, C. S., & Clark, V. A. (1981). Prevalence of depression in Los Angeles County. *American Journal of Epidemiology, 13,* 691–699.

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.

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. *Anthrozoös, 3,* 35–44.

Husaini, B. A., Neff, J. A., Harrington, J. B., Hughes, M. D., & Stone, R. H. (1980). Depression in rural communities: Validating the CES-D Scale. *Journal of Community Psychology, 8,* 20–27.

Kahana, E., & Kahana, B. (1983). Stress reactions. In M. Lewinsohn & L. Teri (Eds.), *Clinical geropsychology: New directions in assessment and treatment* (pp. 139–169). New York: Pergamon Press.

Kessler, R. C., & McLeod, J. D. (1985). Social support and mental

health in community samples. In S. Cohen & S. L. Syme (Eds.), *Social support and health* (pp. 219–240). Orlando, FL: Academic Press.

Lago, D., Connell, C. M., & Knight, B. (1983). A companion animal program. In M. A. Smyer & M. Gatz (Eds.), *Mental health and aging* (pp. 165–184). Beverly Hills, CA: Sage.

Lago, D. J., Knight, B., & Connell, C. (1983). Relationships with companion animals among the rural elderly. In A. H. Katcher & A. M. Beck (Eds.), *New perspective on our lives with companion animals* (pp. 303–317). Philadelphia: University of Pennsylvania Press.

Lawton, M. P., Moss, M., & Moles, E. (1984). Pet ownership: A research note. *Gerontologist, 24,* 208–210.

Lubben, J. E. (1984). *Health and psychosocial assessment instruments for community-based long-term care: The California Multipurpose Project experience.* Unpublished doctoral dissertation, University of California, Berkeley.

Lubben, J. E. (1988). Assessing social networks among elderly populations. *Journal of Family and Community Health, 11,* 42–52.

Mechanic, D. (1972). Social psychologic factors affecting the presentation of bodily complaints. *New England Journal of Medicine, 286,* 1132–1139.

Mugford, R. A., & M'Comisky, J. G. (1975). Some recent work on the psychotherapeutic value of cage birds with old people. In R. S. Anderson (Ed.), *Pet animals and society* (pp. 54–65). London: Bailliere Tindall.

Murrell, S. A., Himmelfarb, S., & Wright, K. (1983). Prevalence of depression and its correlates in older adults. *American Journal of Epidemiology, 117,* 173–185.

Muschel, I. J. (1984). Pet therapy with terminal cancer patients. *Social Casework,* 451–458.

Ory, M., & Goldberg, E. (1983). Pet ownership and life satisfaction in elderly women. In A. H. Katcher & A. Beck (Eds.), *New perspectives on our life with companion animals* (pp. 803–817). Philadelphia: University of Pennsylvania Press.

Perlman, D., & Peplau, L. A. (1984). Loneliness research: A survey of empirical findings. In L. A. Peplau & S. E. Goldston (Eds.), *Preventing the harmful consequences of severe and persistent loneliness* (DHHS Publication No. ADM 84-1312, pp. 13–46). Rockville, MD: National Institute of Mental Health.

Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1,* 385–401.

Rahe, R. H., & Arthur, R. J. (1978). Life change and illness studies: Past history and future directions. *Journal of Human Stress, 4,* 3–15.

Regier, D. A., Goldberg, I. D., & Taube, C. A. (1979). The de facto U.S. mental health services system: A public health perspective. *Archives of General Psychiatry, 35,* 685–693.

Robb, S. S., & Stegman, C. E. (1983). Companion animals and elderly people: A challenge for evaluators of social support. *Gerontologist, 23,* 277–282.

Shuval, J. (1970). *The social functions of medical practice.* San Francisco: Jossey-Bass.

Soares, C. J. (1985). The companion animal in the context of the family system. *Marriage and Family Review, 8,* 49–62.

Tessler, R., Mechanic, D., & Dimond, M. (1976). The effect of psychological distress on physician utilization: A prospective study. *Journal of Health and Social Behavior, 17,* 353–364.

Waxman, H. M., Carner, E. A., & Blum, A. (1982). Depressive symptoms and health service utilization among the community elderly. *Journal of the American Geriatric Society, 31,* 417.

Weissman, M. M., Sholomskas, D., Pottenger, M., Prusoff, B. A., & Locke, B. Z. (1977). Assessing depressive symptoms in five psychiatric populations: A validation study. *American Journal of Epidemiology, 106,* 203–214.