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Playing With Pets and Longevity Among Older People

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Models of the relations between contact with pets and better health are examined in an archival prospective study using data derived from the longitudinal study initiated by Terman in 1921 (current $N = 343$ men, 300 women). In survival analyses of documented longevity, playing with pets in 1977 (M age = 67 years) was not associated with mortality risk through 1991 for the total sample nor for those who were unmarried or those who were less satisfied with their human relationships. Playing with pets was not associated with health-prone attributes or healthy behaviors such as personality, social ties, education, and smoking.

The positive association between social relationships and physical health is well documented—individuals who are socially integrated tend to enjoy better health and a lower mortality risk than individuals who are isolated from others (e.g., Berkman & Syme, 1979; House, Robbins, & Metzner, 1982; Schoenbach, Kaplan, Fredman, & Kleinbaum, 1986). Although the mechanisms through which social integration is related to health are less clear, the literature suggests that companionship is health promoting. Older people, however, often find themselves with limited social interaction. Researchers therefore have become increasingly interested in whether older people might experience health-promoting effects from interacting with pets (see Siegel, 1993, for an overview). Models of human-pet interaction propose that interacting with pets promotes health in some of the same ways in which human interaction may promote health, such as providing the owner with love, a sense of purpose and responsibility, and feelings of security (Winkler, Fairnie, Gericevich, & Long, 1989). This greater psychological well-being, in turn, may have a beneficial effect on health by reducing physiological arousal or by promoting healthy behavior.

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Although these postulates have not been fully tested, they have received some empirical support. Ory and Goldberg (1983) and Garrity, Stallones, Marx, and Johnson (1989) have both found that pet attachment, but not pet ownership, is associated with greater psychological well-being. Several other studies have also found no association between pet ownership and psychological well-being (Lawton, Moss, & Moles, 1984; Robb & Stegman, 1983). An exception is a study by Goldmeier (1986), which reports that pet ownership is associated with greater morale among older women who live alone but not among those who live with others. In general, it appears that the mere presence of a pet has little effect on psychological well-being, but being attached to a pet can have a significant beneficial effect on psychological well-being. In turn, several studies of college- and middle-aged individuals have shown that interacting with pets or being in the presence of a pet reduces physiological arousal (Allen, Blascovich, Tomaka, & Kelsey, 1991; Grossberg & Alf, 1985; Wilson, 1987, 1991).

If this line of explanation is correct, then regularly playing with pets should have a positive, long-term effect on the physical health of older individuals. Most studies of older people addressing the potential positive effects of human-pet interaction on health have either used samples of older people with special needs (institutionalized or recently experienced a major stressful life event) or have studied the effects of pet intervention among those who would not normally own or interact with a pet. Studies using these participant populations have generally found that human-pet interaction is associated with better health (Akiyama, Holtzman, & Britz, 1986-1987; Bolin, 1987; Friedmann, Katcher, Lynch, & Thomas, 1980), although one longitudinal study has not found consistent relationships (Lago, Delaney, Miller, & Grill, 1989; Miller & Lago, 1990). Fewer studies have investigated the health effects of human-pet interaction among more representative samples of older individuals. Garrity et al. (1989) found that attachment to pets was associated with better health—but only when human support was less available.

It also should be noted that although some previous research suggests that human-pet interaction may be associated with physical health, the causal direction in this relationship is unclear. Virtually all studies have measured human-pet interac-

tion and health status concurrently. Although most researchers assume that it is the human-pet interaction that influences physical health, it is quite possible that one's health status influences the extent of human-pet interaction. Alternatively, retrospective self-report biases may be operating. One step in determining causality is to see whether human-pet interaction is prospectively related to longevity, controlling for initial health status. In the present study, we look at several different aspects of the association between human-pet interaction and health, both concurrently and prospectively.

An artifactual model of pet interaction and health, rather than proposing any direct health benefit of human-pet interaction, suggests that this relationship is due to self-selection. If older individuals who play with pets differ in some way from older individuals who do not play with pets (e.g., are less depressed, have a healthier lifestyle, or have more social contacts) then these differences may be responsible for the association between playing with pets and health. Little is known about potential differences between individuals who play with pets and those who do not. However, it is important that research in this area focus on third variables theoretically associated with health outcomes such as personality and social network characteristics, health-related behaviors, and socioeconomic-status-related variables.

The present study uses data from the 70-year longitudinal study initiated by Lewis Terman to examine these explanations. First, to determine whether health-prone individuals are more likely to play with pets, older individuals who report playing with pets are compared with individuals who report not playing with pets on a number of relevant psychological, social, and behavioral measures. Second, the association between playing with pets and health is assessed in several ways. The relationship between human-pet interaction and health is assessed concurrently to allow comparisons with previous work. Of more interest, however, are analyses of whether frequency of playing with pets predicts mortality risk over a 13-year period, controlling for initial health status. In light of Garrity et al.'s (1989) findings, we also determine whether playing with pets increases longevity only for those individuals who are more socially isolated (unmarried) or less satisfied with their relationships.

Method

Participants

Participants in the original, full sample were 1,528 individuals (856 men, 672 women) who participated in the Terman Life Cycle Study, which was conducted from 1921 through 1991 (Terman & Oden, 1947). The mean year of birth for the participants was 1910, and their mean age at the start of the study was 11 years. Participants were generally selected for the study from sampling schools in California for bright children (IQ scores over 135). The sample is homogeneous with respect to intelligence (bright), race (mostly White), and social class (mostly middle; Terman, 1925).

Participants were excluded from the present study for the following reasons: 155 participants were not of school age when data collection began (they were not born between 1904 and 1915); 655 participants either died or dropped out of the study before 1979; 19 participants had an unknown date of death; and 56 participants were missing information on self-reported health, frequency of playing with pets in 1977, or both. These exclusions resulted in a sample size of 343 men and 300

women (mean age in 1977 = 67 years). Out of these 643 participants, 185 (29%) died during the period 1979-1991 inclusive, and their date of death is known from death certificates that we collected from state agencies. Sample sizes for additional analyses may be slightly smaller than $N = 643$, if participants were missing information on relevant variables.

Measures

Playing with pets. In 1977, participants were asked the frequency with which they played with pets. This item was rated on a 4-point scale: 1 = *never* ($n = 286$), 2 = *seldom* ($n = 106$), 3 = *occasionally* ($n = 93$), and 4 = *frequently* ($n = 158$).

Self-rated health and health-related behaviors. Current health status was assessed in 1977. Participants rated their current health, and this response was classified into a 4-point scale: 1 = *very poor or poor* ($n = 16$), 2 = *fair* ($n = 69$), 3 = *good* ($n = 264$), and 4 = *very good* ($n = 294$).

Alcohol consumption was assessed in 1950 and 1960. At both decades, participants were classified into three categories: 0 = *never taking a drink or only on rare occasions*, 1 = *moderate drinkers* (never or seldom intoxicated), or 2 = *heavier drinkers*. The rating, from either 1950 or 1960, that indicated the heaviest drinking was used as an indicator of alcohol use for each participant.

We collected smoking information during 1991-1992. Participants (if they were alive and could be located) or a close relative were sent a postcard asking about the participant's smoking history. The number of pack-years was computed for each participant as (total number of years person smoked \times mean number of cigarettes per day person smoked during those years)/20. The number of pack-years was converted into a four-category variable: 0 = *nonsmoker*, 1 = *1-16 pack-years*, 2 = *16.01-44 pack-years*, and 3 = *44.01-180 pack-years*.

Body mass index was used as the measure of obesity. In 1940, participants reported their weight (converted to kilograms) and their height (converted to centimeters). Body mass index was computed as (weight/height²) \times 100.

Social ties in 1977. Several types of social ties were assessed as of 1977. Participants were classified by marital status as 0 = *unmarried* or 1 = *married*. Number of living children, number of living siblings, and number of organizational memberships (each coded as 0, 1, 2 or more) were determined. Participants rated the frequency with which they engaged in informal visiting with friends and neighbors (1 = *never or seldom*, 2 = *occasionally*, 3 = *frequently*) and the overall level of satisfaction they have experienced with friendships and social contacts (1 = *not at all satisfying* to 5 = *highly satisfying*).

Childhood psychosocial characteristics. Childhood personality scales were developed from ratings that the parent and teacher independently made of each child in 1922. After choosing the scale items, on the basis of the results of a factor analysis as well as theoretical considerations, the parent and teacher ratings were standardized and summed to form each scale. The six personality scales measure Conscientiousness/Social Responsibility, Cheerfulness/Humor, Permanency of Moods, Sociability, High Energy/Activity, and High Motivation/Self-Esteem. (For a full description of the development of these scales, see Friedman et al., 1993.)

In 1940 and 1950, participants were asked to retrospectively rate the quality of various aspects of their relationship with their mother and with their father before adulthood, as well as the amount of punishment they received and the amount of friction in their family. These items were factor analyzed, and the relevant items were standardized and summed to form two scales: Nurturing Family Environment and Stressful Family Environment. (For a full description of this scale development, see Schwartz et al., in press.)

Finally, participants provided information on their cumulative education in 1950 by indicating the highest grade level they had completed (1 = *1 year of high school* to 16 = *8 years postgraduate*).

Table 1
Distributions of Variables

Variable	N	Range	M	SD
Playing with pets	643	1-4	2.19	1.24
Self-rated health	643	1-4	3.30	0.76
Number of children	643	0-2	1.46	0.81
Number of siblings	642	0-2	1.05	0.80
Number of organizations	643	0-2	0.94	0.89
Frequency of visiting	639	1-3	2.26	0.70
Satisfaction with friends	620	1-5	4.21	0.71
Marital status	643	0-1	0.76	0.43
Smoking	498	0-3	1.22	1.18
Alcohol	631	0-2	1.05	0.65
Obesity	592	12-39	0.22	0.03
Conscientiousness	615	5-33	21.28	4.81
Cheerfulness	615	12-28	20.81	2.60
Permanency of mood	615	16-25	21.03	1.55
Sociability	615	5-32	21.03	4.22
High energy	615	10-32	20.95	2.35
High motivation	615	6-36	20.88	5.34
Nurturing family	566	6.90-11.98	9.99	0.81
Stressful family	560	8.82-12.93	9.98	0.72
Education	616	1-16	8.47	2.43

Analytic Procedures

To predict longevity from frequency of playing with pets, we used hazard regression analysis, which is a form of survival analysis. Specifically, we used Cox's proportional hazards regression model to predict mortality. The Cox model makes no assumptions about the functional form of the underlying hazard function, but it does assume that the effect of each explanatory variable is multiplicative and constant across all ages. The RATE computer program (Tuma, 1980) was used because of its ability to properly treat left-censored data. In the Cox regression analyses, we eliminated from the analyses participants who died between 1977 and 1979. Thus, mortality was predicted from 1979, rather than 1977 (when frequency of playing with pets was assessed). This conservative strategy ensures that someone who was terminally ill in 1977 (and so could not play with or be around pets) would not unfairly bias the analysis against finding an effect of pets.

Results

Distributions of all variables are shown in Table 1. On conceptual grounds, the variable measuring frequency of playing with pets was dichotomized (1 = *never or seldom*, 2 = *occasionally or frequently*). (Analyses using the 4-point scale led to identical conclusions.) These two groups of participants were compared on theoretically relevant psychological, social, and behavioral dimensions. Using two-tailed *t* tests, no differences were found between these groups on the following measures: Nurturing Family Environment, Stressful Family Environment, the six childhood personality scales, adulthood body mass index, and cumulative education (all *ts* < 1.7, *dfs* > 557). It should be noted that the sample sizes for these analyses are sufficient to provide 80% power to detect a small (e.g., .2 *d*) effect size with $\alpha = .01$.

A Mantel-Haenszel chi-square test was then used to test for a linear relationship between the playing with pets variable and each of the following variables: marital status, number of living children, number of living siblings, number of organizational

memberships, frequency of informal visiting with friends and neighbors, satisfaction with friendships, alcohol consumption, and smoking. Participants who never or seldom played with pets reported consuming less alcohol than participants who occasionally or frequently played with pets, $\chi^2(2, N = 631) = 9.42$, $p < .01$. However, these two groups did not significantly differ on any of the other characteristics (all χ^2 s < 3.65, *Ns* > 497). Also, frequency of playing with pets in 1977 was not found to be significantly associated with self-rated health in 1977, $\chi^2(3, N = 643) = 1.36$, *ns*.

Table 2 shows the results from the Cox proportional hazards regression analysis predicting mortality as of 1991 from frequency of playing with pets in 1977, controlling for sex and self-rated health in 1977 (results are also shown stratifying by sex). Results indicate that playing with pets in 1977 was not a significant predictor of longevity. Results were essentially unchanged when self-rated health was not entered into the analysis as a control variable. These null results are probably not due to inadequate power; this study has 76% power to detect a relative odds rate greater than 1.5.

To determine whether playing with pets was associated with longevity only for those who were socially isolated, two additional analyses were conducted. For the first analysis, participants were divided into two groups based on marital status: those who were unmarried ($n = 153$) and those who were married ($n = 490$). Results from the Cox proportional hazards regression analysis (controlling for sex and self-rated health) indicated that frequency of playing with pets was not a significant predictor of mortality for the unmarried group (relative hazard = 1.24, *ns*) nor for the married group (relative hazard = 0.91, *ns*). For the second analysis, participants were divided into two groups based on their satisfaction with their friendships and social contacts: those who were not highly satisfied ($n = 394$) and those who were highly satisfied ($n = 226$). Results of the Cox proportional hazards regression analysis (controlling for sex and self-rated health) indicated that playing with pets was not

Table 2
Cox Proportional Hazards Regression Analysis Predicting Mortality From Playing With Pets, Controlling for Sex and Self-Rated Health

Variable	Total (N = 643)	Men (N = 343)	Women (N = 300)
Sex (<i>men</i> = 0, <i>women</i> = 1)			
b	-0.43		
RH	0.65*		
Self-rated health (<i>very poor to poor</i> = 1 to <i>very good</i> = 4)			
b	-0.32	-0.23	-0.43
RH	0.73**	0.80†	0.65*
Playing with pets (<i>never/seldom</i> = 0, <i>occasionally/frequently</i> = 1)			
b	-0.08	-0.17	0.10
RH	0.93	0.84	1.10

Note. RH = relative hazard.

† $p < .10$. * $p < .01$. ** $p < .001$.

associated with mortality risk for the group who was less satisfied with their social contacts (relative hazard = 0.91, *ns*) nor the group who was more satisfied with their social contacts (relative hazard = 0.89, *ns*).

Discussion

Attention has turned in recent years to the possible protective effect of human-pet interaction on the physical health of older people. A National Institutes of Health assessment group maintained that there is encouraging evidence that pets are medically beneficial to some people's health (National Institutes of Health, 1988). Indeed, formal programs for bringing pets to older people are in place in many communities and hospitals. Although several studies have shown an association between human-pet interaction and health outcomes, important questions have remained unanswered. Is the relationship between human-pet interaction and health due to self-selection: Are health-prone people more likely to play with pets? Alternatively, is the physical contact and joy of a pet generally health protecting? Is playing with a pet health protecting only for those individuals who are socially isolated? The present study was an attempt to address these questions using a sample of relatively healthy, noninstitutionalized older people.

This is the first study that comprehensively compares people who choose to play with pets with those who choose not to play with pets on a number of health-relevant characteristics. The results suggest that any association that is found between human-pet interaction and physical health, at least among noninstitutionalized older people, is not due to a dramatically greater health proneness among those who choose to interact with pets. Although the degree to which these results can be generalized to other populations is unknown, they do increase confidence in concluding that any association between human-pet interaction and health is due to the human-pet interaction itself, rather than to a self-selection bias.

The present study found no association between frequency of playing with pets in 1977 and self-rated health in 1977. It does not seem to be the case in this sample that those who frequently played with pets reported better health or that current health status influenced frequency of playing with pets. Furthermore, and most important, those who frequently or occasionally played with pets did not have a lower mortality risk compared with those who seldom or never played with pets. Analyses of subsamples, those who were unmarried and those who were less satisfied with their social relationships, similarly showed no association between playing with pets and mortality risk. The present results do not support previous research that has found an association between human-pet interaction and physical health. However, most of these previous studies have investigated this relationship in populations with special needs, such as older people who are institutionalized or who have recently experienced a stressful life event (Akiyama et al., 1986-1987; Bolin, 1987; Friedmann et al., 1980). The present results may differ from this previous work because of the use of a population of noninstitutionalized older people in this study.

There are two limitations to this study that should be acknowledged. First, we cannot be certain the degree to which "playing with a pet" measures an individual's attachment to the

pet. Although "frequently playing with a pet" certainly indicates more of an invested relationship than simply "owning a pet," it is conceivable that spending time playing with a pet each day might be done for reasons other than enjoyment or attachment (such as exercise). However, it is also difficult to imagine a situation in which an individual interacts frequently with a pet and does not develop an attachment relationship with that animal. A second limitation of this study involves the homogeneous nature of the sample. In interpreting these findings, it should be emphasized that this is a sample of bright, White, middle-class individuals. Therefore, the results may not generalize to groups of individuals with different background characteristics.

The associations between frequency of playing with pets and longevity in this prospective study of noninstitutionalized older people gives strength to the following conclusion: Frequency of playing with pets does not have a generally beneficial effect on health. Therefore, it appears that human-pet interactions may be most likely to have an effect for individuals with special needs. In light of previous work, it appears that human-pet interactions may be especially useful for older individuals who are institutionalized or for those recovering from a major stressor such as surgery or the loss of a loved one. However, for the majority of the older people who are not in these situations, human-pet interaction may do little to predict or promote longevity.

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