Walking the Dog:
The Effect of Pet Ownership on Human Health and Health Behaviors

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This analysis explores whether pet owners have better physical health outcomes, and if so, whether the positive physical health benefits are explained by better health behaviors that result from having to take care of the pet's physical needs. Data come from the National Health and Nutrition Examination Survey (NHANES), a representative sample of the non-institutionalized United States population. Analyses were limited to persons living alone (n=2474) in order to isolate primary pet caretakers from those merely living in a pet household. Results showed that pet owners, particularly dog and cat owners, had more positive physical health outcomes when compared to non pet owners or those owning other types of pets. Surprisingly, the effect of pet ownership was not mediated by health behaviors such as recreational walking. However, the health benefits of pet ownership were largely reduced once sociodemographic variables such as age, socioeconomic status, and residential location were controlled. The positive health effects of pet ownership appear to be primarily the result of selection, not increased physical activity associated with the active caretaking of pets.

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Research has found that people benefit from living with a pet (Anderson, Reid, & Jennings, 1992; Headey & Grabka, 2007; Headey, Na, & Zheng, 2008; Hines, 2003; Katcher, Beck, & Levine, 1989; Manson et al., 1992; Raina, Waltner-Toews, Bonnett, Woodward, & Abernathy, 1999; Rowan & Beck, 1988; Serpell, 1991; Siegel, 1990). Most studies emphasize the social or emotional benefits, suggesting that pet ownership aids in the formation of self identity (Irvine, 2004; Sanders, 2003) or that human-animal bonds provide increased social capital (Wood, Giles-Corti, & Bulsara, 2005), social support (Garrity, Stallones, Marx, & Johnson, 1989; Knight & Edwards, 2008), and companionship(Barker, Rogers, Turner, Karpf, & Suthers-McCabe, 2003; Raina, et al., 1999). Given the social and psychological benefits of pet ownership (Hines, 2003), pet owners might also experience better physical health. However, findings regarding physical health benefits of pet ownership are contradictory (Thorpe, Simonsick et al., 2006). For example, one study which gained widespread media attention [Reuters 01/07] claimed that pet owners are less healthy than non pet owners (Koivusilta & Ojanlatva, 2006). Another study suggested that pet owners, although consistently mentioning social and psychological benefits, did not have significantly better or worse self-reported health than non pet owners (Wells, 2009). Australian researchers reported no health differences between pet owners and non-owers (Jorm et al., 1997; Parslow & Jorm, 2003). On the other hand, numerous other studies have claimed that pets have the potential to improve owners' overall physical health (Anderson, et al., 1992; Headey, 2003; Heady, 2003; Rowan & Beck, 1988) and to reduce physician visits (Headey, 1999, 2003; Heady, 1999, 2003; Siegel, 1990). These studies often focus on physiological mechanisms linking pet ownership to better health outcomes, such as lowered blood pressure(Anderson, et al., 1992; Katcher, et al., 1989) and reduced stress (Motooka, Koike, Yokoyama, & Kennedy, 2006; Siegel, 1993).

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Although some of the inconsistencies may be due to conceptual and disciplinary differences in what should and should not be considered causal pathways linking pet ownership and human health (Headey, 2003), methodological shortcomings are often cited for the inconsistent findings in the human-animal literature. First, most studies use small convenience-based samples that do not have adequate power to control for variables that potentially confound the relationship between pet ownership and health-related outcomes (Barker, et al., 2003; Cutt, Giles-Corti, Knuiman, & Burke, 2007; Koivusilta & Ojanlatva, 2006; Wilson & Barker, 1994). Like most health-related outcomes, pet ownership varies by sociodemgraphic factors (Brown, 2003; Marx, Stallones, Garrity, & Johnson, 1988; Müllersdorf, Granström, Sahlqvist, & Tillgren, 2010; Watson & Weinstein, 1993; Wells & Hepper, 1997), so it is imperative to control for such covariates when trying to understand the causal processes linking pet ownership to human health outcomes. Large-n representative samples would also lead to more generalizable results.

Second, much of the existing human-animal research has failed to explain the mediating factors through which pet ownership may promote or inhibit human health (Beck & Katcher, 2003; Wilson & Barker, 1994). Previous research has found that pet owners have higher activity levels compared to non pet owners (Headey, et al., 2008; Serpell, 1991; Thorpe, Kreisle et al., 2006; Thorpe, Simonsick, et al., 2006), thus a potential behavioral mechanisms linking pet ownership to physical health might come from the fact that pets often require frequent and regular exercise, which could be provided in the form of a walk or jog around the block.

Lastly, most of the existing research has not considered whether the positive effects associated with human-animal interaction might differ based on the type of pet owned (Cutt, et al., 2007; Rijken & van Beek, 2010). Many focus on a single type of pet owner, most often dog owners, while others lump all pet owners into a single category compared to non-pet owners. The care required and benefits accrued from pet ownership likely differ by the type of pet one owns. For

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example, dogs require more owner-initiated exercise, on average, than cats, birds, or reptiles; thus providing a more direct linkage between pet ownership, health behaviors, and physical health outcomes among dog owners than among other pet owners.

The current study addresses each of these methodological shortcomings in order to better understand whether and how pet ownership might affect human health. More specifically, this study uses the National Health and Nutrition Examination Survey (NHANES), a nationally representative sample of the noninstitutionalized U.S. population, to explore first whether pet owners have better *physical* health outcomes, and whether this effect differs by *type of pet* owned. Next, it explores whether the effect of pet ownership on human health is mediated by an increase in positive *health behaviors* that are directly related to taking care of an animal. It controls for various sociodemographic factors that are associated with both pet ownership and health, and therefore could confound the relationship. The primary hypothesis concerns whether dog owners engage in more healthful activities, like frequent walking or jogging, that may ultimately provide greater physical health benefits compared to owners of different types of pets – a research area that has been called for in a recent literature review on the topic (Cutt, et al., 2007). Not all persons living in a household with a pet may experience the positive health benefits associated with pet caretaking because they may not be actively involved in caring for the pet (Parslow & Jorm, 2003); thus, analyses focus on primary pet caretakers.

This study is important because it begins to tease apart whether and how companionship from household pets and caretaking required by those animals might affect the health behaviors and ultimately physical health outcomes of owners. Identifying factors from every-day life that might increase healthful behaviors are especially relevant to the public health of America, as they might lead to a lower risk of cardiovascular disease and other chronic conditions, which are the leading causes of death and health care expenditures in the United States.

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METHOD

Data come from the National Health and Nutrition Examinations Study (NHANES), a repeated cross-sectional survey of the noninstitutionalized American population conducted since the 1950s. NHANES consists of an in-person interview and physical examination. NHANES is commonly used to track the prevalence of illness and to identify risk factors for health-related outcomes (CDC, 2010). NHANES III was used for this analysis; it is the only survey that uses a nationally representative sample of an all-age population and contains information on health status, health behaviors, and pet ownership.

Sample: Unfortunately, NHANES did not include data allowing for the identification of whether respondents were the primary caretakers of household pets, so a subsample of persons living alone (n=2474) was used for the analyses reported herein. Pet owners who live alone are assumed to be, by default, the primary pet caretaker and thus will receive full benefits of pet ownership. Persons merely living in a pet household may not accrue the same benefits, since they may not be directly involved in the caretaking of that pet (Parslow & Jorm, 2003). Although the primary analytic sample comes from the living-alone or primary pet caretaker sample (n=2474), all analysis were run and compared across the living alone and full adult sample (n=18,162). While the results were largely similar across both samples, effect-sizes derived from the full sample were muted compared to those from the primary caretaker sample.

Table 1 shows that persons living alone did differ in characteristic ways from the full sample of adults. As expected, persons living alone were less likely than the full sample to be married, were more likely to be Non-Hispanic and White, were older (perhaps related to their higher rates of widowhood or divorce), and had slightly higher levels of education. Given these differences, all analyses controlled for race, class, gender, and age. As well, to adjust for unequal probabilities of

selection and nonresponse attributable to the NHANES sampling design, sample weights were applied to all analyses (CDC, 1996).

[insert Table 1 about here]

Measures: The independent variable was *pet ownership*. The dependent variable was *physical health*. Mediating variables were *health behaviors*. Control variables included various *sociodemographic variables*.

Pet Ownership: Respondents answered a two-part question about domesticated animals in the household: Does a pet live here? If yes, what type of pet is it? Responses included dog, cat, fish, bird, rodent, rabbit, reptile, and farm pet. Given the relatively small number of persons who had pets other than dogs or cats, only three categories of pet ownership were considered: dog, cat, and other. Households reporting multiple types of pets were coded as having the pet which required the most physical care: dog, then cat, then other.

Physical Health was assessed with *self-rated global health* (How would you rate your health? Excellent, Very good, Good, Fair, Poor), *physician assessed health* (How would you rate the health of this patient? Excellent, Very good, Good, Fair, Poor), and *self-reported diagnoses* of congestive heart failure, asthma, arthritis, and allergies (Has a doctor ever told you that you have ___? Yes/No). Body mass index (BMI = weight in kg / height in m^2) was used to assess whether someone was *obese* (BMI $\geq$ 30).

Health Behaviors assessed whether the respondent engaged in various forms of physical activity in the past month: walking a mile without stopping, jogging or running, bicycling (indoor or outdoor), swimming, aerobics, calisthenics, garden or yard work, and lifting weights. Walking behaviors, the primary variable of interest since it is likely the most related to the care of a pet, was assessed by whether someone walked a mile without stopping *ever* in a month or whether they walked a mile without stopping *at least 5 times a week*. The latter measurement translates to USDA's

recommendation that adults should get at least 30 minutes of moderate exercise at least five times a week.(USDHHS & USDA, 2005)

Sociodemographic Variables: All analyses controlled for covariates associated with pet ownership, health, and health behaviors: *Age* (in years), *Sex* (male/female) *Race* (Nonhispanic Whites vs. other race/ethnicity groups), *Education* (highest grade completed), and *Residential Location* (metropolitan area vs. nonmetropolitan area). Because the analytic sample is limited to those people living alone, analyses did not need to control for confounding variables such as marital status or number of people living in the household; these are largely constant for the living alone sample.

Analytic Plan: First, patterns of physical health by pet ownership were explored using descriptive statistics. Next, logistic regression was used to estimate the relationship between pet ownership and pet-type on health outcomes (i.e., obesity and self-rated health). Finally, the hypothesis about whether pet caretaking might explain or mediate the relationship between pet ownership and human health was tested by the estimation and comparison of two regression equations (Baron & Kenny, 1986; Judd & Kenny, 1981; MacKinnon, Warsi, & Dwyer, 1995):

$$Y = b_{01} + t\,X + e_1$$

$$Y = b_{02} + t'\,X + bM + e_2$$

As in standard regression equations, intercepts are represented as b_{01} and b_{02} while e_1 and e_2 code unexplained variability not accounted for by the variables in the equation. Y is the outcome variable (physical health), X is the primary independent variable (pet ownership), M represents a vector of possible mediator variables (e.g., health behaviors & sociodemographic controls), t codes the direct relationship between pet ownership and health, and t' is the coefficient relating pet ownership to health after adjusting for potential mediator variables. The mediated or indirect effect equals the difference in the coefficients (t-t'): Complete mediation occurs when t' is zero; substantively, this indicates that the effect of pet ownership was entirely explained by an indirect causal pathway linking

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pet ownership to human health via variation in mediator variables. Partial mediation occurs when t' is reduced in size compared to t, but still remains significantly different from zero. No mediation effect is identified when t' = t after controlling for possible mediating influences. All analyses were performed in STATA MP 10.

RESULTS

Profile of Pet Owners: Among those living alone, approximately one-quarter (26%) reported a household pet, with dogs being the most common. Pet ownership was significantly higher among the full sample, where approximately four out of every ten households (42%) reported having a pet. Pet ownership, across both living alone and full samples, was most common among Non-Hispanic Whites, those with higher levels of SES (education & income), younger persons, married households, and those with larger household sizes; these demographic differences largely account for the lower rates of pet ownership among persons living alone. Females and males had similar pet ownership rates, but women were slightly more likely than men to own a cat. Cat ownership was also more common in metropolitan areas and among Non-Hispanic Whites. As expected, dog ownership was most common among persons who had larger household sizes and lived within non-metropolitan areas.

Pet Ownership & Health: Table 2 shows the bivariate relationship between pet ownership and physical health. Pet owners were less likely than non pet owners to be obese, have a diagnosis of congestive heart failure, or report having arthritis. Pet owners were also more likely to have excellent or very good health, as measured by both self-rated and physician-assessed health. There is a noted exception to the positive effect of pet ownership– allergy and asthma were more prevalent among pet owners than non-pet owners. This is likely attributable to pet owners having more contact with animals, thus being more aware and more likely to be diagnosed with allergy or asthma.

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Furthermore, high rates of asthma and allergies among "other pet owners" may suggest that once diagnosed with such ailments, persons opt for hypo-allergenic pets such as reptiles, birds, or fish.

[insert Table 2 here]

Table 3 presents a series of multivariate models further documenting the positive effect of pet ownership on health; these models focus only on obesity and self-rated health, as these outcomes are assumed to be most related to the behavioral mechanisms that might mediate this relationship (i.e., walking the dog). Pet owners were less likely to be obese and more likely to report excellent or very good health than non pet owners. However, part of this effect on obesity and all of the effect on self-rated health was mediated by the addition of sociodemographic control variables.

[insert table 3 here]

The Mediating Role of Exercise: Table 4 presents four separate regression models for each of the two dependent variables: First, Model 1 compares the health status of dog, cat, and other pet owners to non pet owners to differentiate the benefits by type of pet owned ; Model 2 adds sociodemographic control variables; Model 3 considers the role of health behaviors associated with routine care of pets (i.e., recreational walking); Model 4 is the full model containing pet ownership, walking behaviors, and sociodemographic controls. Comparison of the coefficient for pet ownership across models shows how the relationship between pet ownership and human health may be mediated by sociodemographic characteristics (compare Models 1 to 2 & 4) and pet caretaking behaviors (compare Models 1 to 3 & 4).

[insert Table 4 here]

Results from Table 4 reveal three important findings: First, the health benefits associated with pet ownership only applied to dog and cat owners, and not other pet owners. The other pet owners had an increased likelihood of obesity and a decreased likelihood of positive self-rated health

compared to non pet owners. Second, walking behaviors did not mediate the effect of pet ownership on health, nor did it improve the fit of the models. This was evident across both outcome variables (obesity and self-rated health) and for all types of pet owners (non owners, dog, cat, and other pet owners). It also held true for the walking variable presented here (1 mile at least 5x/week), as well as other conceptualizations of behaviors such as whether respondents ever walked in a month or if they ever jogged during the month. Third, as found above in Table 2, the positive effects of dog and cat ownership were partially mediated for obesity and completely mediated for self-rated health after controlling for sociodemographic characteristics.

Descriptive trends presented in Table 5 reveal that pet owners were more likely than non pet owners to engage in a wide variety of exercise behaviors other than just walking and jogging; these include bicycling, swimming, aerobics, calisthenics, gardening, and weight lifting. These activities are not associated with the regular care of a dog, cat, or any other type of animal. Thus, these data provide further evidence that pet ownership is not necessarily associated with better health behaviors as a result of the routine care of a pet.

[insert Table 5 here]

DISCUSSION

This analysis used data from a nationally representative sample of the U.S. population to explore the effect of pet ownership on human health. Existing literature on the effects of pet ownership on human health has produced contradictory results (Headey, 2003) - although it is largely assumed that "pets probably do confer some human health benefits, but we do not know precisely how" (pg 460). The mixed findings may be the result of different disciplinary approaches to understanding the causal relationship between pet ownership and human health (i.e., social scientists and medical scientists may define causal processes and factors differently). Or, perhaps mixed findings may be the result of methodological differences in the samples, outcomes, or

variables assessed. The current study provides a methodologically superior analysis of the effects of pet ownership on human health, given its ability to separate dog owners from cat and other pet owners, its focus on pet caretakers versus pet owners, its ability to control for covariates that may confound the relationship between pets and human health, and its exploration of potential mediators that identify how pet ownership might causally affect human health.

The primary hypothesis was that pet owners would have better physical health, but that this effect would be partially explained by increases in health behaviors associated with pet caretaking, such as recreational walking or jogging. This hypothesis should be particularly pervasive among dog owners, since dogs often require more frequent exercise than other types of pets. Partial support for the hypothesis was found: Dog and cat owners exhibited lower rates of obesity and higher odds of reporting excellent or very good health when compared to non pet owners and other pet owners. This positive health effect, however, was not explained by an increase in health behaviors associated with the caretaking of a pet. In other words, the need to physically care for a pet (e.g., walking the dog) does not explain why dog and cat owners have better physical health. The vast majority of health benefits among dog and cat owners were explained away after controlling for sociodemographic characteristics.

These results indicate that the positive health benefits associated with pet ownership are likely attributable to selection. The use of cross-sectional data, however, makes it difficult to discern the causal relationship between pet ownership, health, and health behaviors – does owning a pet cause one to become more active? Or is being more active associated with one's propensity to get a pet? Some past longitudinal studies found that, among dog owners, pet acquisition was associated with an increase in recreational walking (Cutt, Knuiman, & Giles-Corti, 2008), while the loss of a pet resulted in decreased health outcomes (Headey & Grabka, 2007) . However, another study revealed inconsistent findings regarding whether pet acquisition increased physical activity of owners; these

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authors, like the current study, suggested that both pet ownership and health-related outcomes were correlated with demographic characteristics of the owner (Pachana, Ford, Andrew, & Dobson, 2005). In other words, the demographic profiles of owners likely confound the direct causal relationship of pet ownership on human health and health behaviors. Further evidence of this claim comes from the current study's finding that pet owners (regardless of pet-type) engage in more frequent exercise such as calisthenics, aerobics, and swimming that are not associated with the active caretaking required by pets.

A strength of the current study is its ability to differentiate the effects of pet ownership across different pet types (dog, cat, other). In so doing, it was found that those owning pets other than dogs and cats did not garner the physical health benefits often associated with pet ownership. Nevertheless, a limitation of this study is its inability to include even more information on the pet, such as its age, breed, health status, or required activity levels. This type of information might provide further understanding of how pets do or do not encourage owners to adopt more healthful behaviors (Rijken & van Beek, 2010). For example, younger pets and particularly active dog breeds may require more exercise, which would disproportionately increase the walking and jogging behaviors among those particular dog owners. Alternatively, owners might initially choose pets based on their personal activity levels: active people may select pets that can be hiking or jogging partners, whereas sedentary persons may select a less active breed or pet-type which does not require regular exercise on the part of its master. Finally, some past literature has suggested that pets might adopt behaviors and personalities of their owners (Irvine, 2004; Sanders, 2003), implying that activity levels of owners might actually determine pet's exercise needs rather than pet's exercise needs influencing owners' activity levels. These types of research conundrums about the causal pathways linking pet ownership to health outcomes, whose results have implications on the public health of humans and animals, ought to be explored with longitudinal designs that include more detailed

information on the pet itself. As well, qualitative studies exploring why owners initially choose certain pets may further tease apart how selection-related factors influence the causal relationship between pet ownership and human health.

Future studies should also consider the strength of the animal-human bond, which has been suggested to be an important mechanism linking pet ownership and human health (Hines, 2003). The current study attempted to control for this by isolating those persons living alone who were, by default, the primary caretakers of the pet. Results based on the full sample of adults, although similar in direction to those presented here, were muted in comparison to those estimated for the living-alone sample, suggesting that those who are most closely associated with regular caretaking of a pet do indeed receive the greatest benefits from the human-animal bond.

Overall, this study has elucidated a potential causal pathways through which pet ownership might (or might not) impact human health. Pet owners, especially cat and dog owners, did exhibit better health outcomes and were more likely to engage in more healthful behaviors such as regular exercise; however, it is unlikely that the relationship between pet ownership and human health is a causal one driven by behavioral changes associated with pet ownership. While pet ownership brings undisputed social and psychological benefits to the owner and/or family (Barker & Wolen, 2008; Knight & Edwards, 2008), it does not appear to encourage increased activity among its owners as a direct result of routine pet caretaking. Thus, pet ownership or pet acquisition will not be an effective means to encourage increased exercise among the largely sedentary population of the U.S.

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Table 1. Demographic Characteristics of Pet Owners, Among the Full Adult Sample & the Living Alone Sample, NHANES III

Full Adult Sample	**Total** n=18,162	**Non Pet Owner** n=12245	**Pet Owner** n=5917	**Type of Pet Owned** **Dog** n=3729	**Cat** n=1468	**Other** n=714
% of Sample	100%	58%	42%	25%	12%	5%
% of Females	57%	58%	42%	25%	13%	5%
% of Males	43%	58%	42%	26%	11%	5%
% of Non Hispanic White	76%	53%	47%	28%	14%	5%
% of "other" Race/Ethnicity	24%	74%	26%	16%	5%	5%
%of Living in Metro. Area	49%	58%	42%	25%	12%	5%
% of Living in Non-Metro. Areas	51%	58%	42%	26%	12%	5%
Avg Education	12.3	12.0	12.6	12.5	12.8	12.4
Avg Age	43.3	44.9	40.9	41.3	41.7	40.0
Avg # People in Household	3.1	3.0	3.3	3.4	3.1	3.7
Living Alone Sample	**Total** n=2,447	**Non Pet Owner** n=1981	**Pet Owner** n=496	**Type of Pet Owned** **Dog** n=291	**Cat** n=141	**Other** n=64
% of Sample	100%	74%	26%	14%	9%	4%
% of Females	57%	72%	28%	14%	11%	3%
% of Males	43%	76%	24%	13%	7%	4%
% of Non Hispanic White	82%	71%	29%	15%	11%	4%
% of "other" race/ethnicity	18%	87%	13%	8%	2%	3%
% in Metro. Area	48%	73%	28%	13%	11%	4%
% in Non-Metro. Areas	52%	75%	25%	14%	8%	3%
Avg Education	12.4	12.2	12.7	12.3	13.0	12.3
Avg Age	53.8	55.3	49.4	53.1	46.4	43.7
Avg # People in Household	1.0	1.0	1.0	1.0	1.0	1.0

Notes: A sample weight has been applied to all analyses to adjust for unequal probabilities of selection and nonresponse. Independent samples t-test between pet owners and non pet owners and one way ANOVA between dog owners, cat owners, and other pet owners showed that all mean differences are statistically significant ($p<0.05$). The text discusses substantively significant results.

Table 2. Health Status by Pet Ownership

	Non Pet Owner n=1981	Pet Owner n=496	Type of Pet Owned: Dog n=291	Cat n=141	Other n=64
Avg BMI	26.4	25.9	25.4	26.2	26.7
Obese (BMI ≥ 30)	21.2%	18.5%	15.9%	19.4%	25.9%
Self Rated Health: Excellent or Very Good	46.8%	53.1%	52.2%	58.1%	43.4%
Physician Impression: Excellent or Very Good Health	58.1%	69.2%	64.5%	73.7%	47.9%
Ever Diagnosed with Congestive Heart Failure	4.3%	2.0%	2.6%	0.8%	3.0%
Ever Diagnosed with Arthritis	30.7%	24.3%	28.3%	21.5%	15.8%
Ever Diagnosed with Asthma	8.5%	8.9%	5.9%	7.2%	25.1%
Ever Diagnosed with Allergy Symptoms due to Anima	6.9%	9.8%	6.3%	10.9%	20.8%

Notes: A sample weight has been applied to all analyses to adjust for unequal probabilities of selection and nonresponse. Independent samples t-test between pet owners and non pet owners and one way ANOVA between dog owners, cat owners, and other pet owners showed that all mean differences are statistically significant ($p<0.05$). The text discusses substantively significant results.

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Table 3. Logistic Regression Coefficients *[B]* and Odds Ratios *[exp(B)]* Predicting the Effect of Pet Ownership on Obesity and Self-Rated Health

Obesity (BMI ≥30)	**Model 1**		**Model 2**	
	B	Exp (B)	B	Exp (B)
Pet Owner	-0.17	0.84	-0.12	0.89
Non Pet Owner	--	--	--	--
Female			0.39	1.48
Age (in years)			0.00	1.00
Non Hispanic White			-0.36	0.70
Education (in years)			-0.03	0.97
Living in Metro Area			0.09	1.10
Constant	-1.31		-1.15	
N	2466		2465	
df	1		6	
Pseudo R-Square	0.00		0.02	

(Excellent or Very Good)	**Model 1**		**Model 2**	
	B	Exp (B)	B	Exp (B)
Pet Owner	0.25	1.29	0.01	1.01
Non Pet Owner	--	--	--	--
Female			0.21	1.24
Age (in years)			-0.02	0.98
Non Hispanic White			0.51	1.66
Education (in years)			0.14	1.16
Living in Metro Area			0.10	1.11
Constant	-0.13		-1.24	
N	2474		2464	
df	1		6	
Pseudo R-Square	0.00		0.17	

Notes: All coeficients are significant at the p< 0.05 level.
Substantively significant results are discussed in the text.

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Table 4. Logistic Regression Coefficients *[B]* and Odds Ratios *[exp(B)]* Predicting the Effect of Pet Type on Obesity and Self Rated Health

Obesity (BMI ≥30)	Model 1		Model 2		Model 3		Model 4	
	B	Exp (B)	B	Exp (B)	B	Exp (B)	B	Exp (B
Dog Owner	-0.35	0.71	-0.32	0.73	-0.35	0.71	-0.31	0.73
Cat Owner	-0.11	0.89	-0.03	0.97	-0.11	0.90	-0.28	0.97
Other Owner	0.26	1.30	0.38	1.46	0.26	1.30	0.37	1.45
Non Pet Owner	--	--	--	--	--	--	--	--
Female			0.39	1.47			0.38	1.47
Age (in years)			0.00	1.00			0.00	1.00
Non Hispanic White			-0.36	0.70			-0.37	0.69
Education (in years)			-0.03	0.97			-0.03	0.97
Living in Metro Area			0.09	1.09			0.10	1.10
Regular Walking (mile 5x/week)					-0.15	0.86	-0.13	0.88
Constant	-1.314		-1.176		-1.30		-1.155	
N	2466		2456		2465		2455	
df	3		8		4		9	
Pseudo R-Square	0.00		0.03		0.01		0.03	

Self Rated Health (excellent or very good)	Model 1		Model 2		Model 3		Model 4	
	B	Exp (B)	B	Exp (B)	B	Exp (B)	B	Exp (B
Dog Owner	0.22	1.24	0.12	1.13	0.21	1.24	0.12	1.13
Cat Owner	0.46	1.58	0.08	1.08	0.45	1.57	0.07	1.08
Other Owner	-0.14	0.87	-0.61	0.55	-0.14	0.87	-0.60	0.55
Non Pet Owner	--	--	--	--	--	--	--	--
Female			0.21	1.23			0.21	1.23
Age (in years)			-0.02	0.98			-0.02	0.98
Non Hispanic White			0.50	1.65			0.50	1.65
Education (in years)			0.15	1.16			0.15	1.16
Living in Metro Area			0.10	1.10			0.10	1.10
Regular Walking (mile 5x/week)					0.17	1.19	0.07	1.07
Constant	-0.127		-1.23		-0.15		-1.24	
N	2474		2464		2473		2463	
df	3		8		4		9	
Pseudo R-Square	0.01		0.17		0.01		0.17	

Notes: ALL coeficients are significant at the p< 0.05 level. Substantively significant results are discussed in the text.

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Table 5. Exercise Behaviors of Pet Owners

	Non Pet Owner n=1981	Pet Owner n=496	Type of Pet Owned: Dog n=291	Cat n=141	Other n=64
Regular Walking (1 mile, 5x/week)	13.8%	16.1%	15.5%	18.1%	13.1%
Jog or Run (ever in month)	13.1%	13.3%	9.4%	13.4%	26.7%
Bicycle (ever in month)	17.2%	19.5%	18.1%	21.3%	20.5%
Swim (ever in month)	8.9%	13.3%	10.7%	13.7%	22.0%
Aerobics (ever in month)	6.9%	12.1%	10.6%	15.9%	7.3%
Calisthenics (ever in month)	25.6%	29.3%	23.7%	32.9%	41.5%
Garden or Yard Work (ever in month)	34.2%	44.9%	59.4%	32.6%	21.9%
Lift Weights (ever in month)	12.5%	14.7%	11.9%	17.3%	18.5%

Notes: A sample weight has been applied to all analyses to adjust for unequal probabilities of selection and nonresponse. Independent samples t-test between pet owners and non pet owners and one way ANOVA between dog owners, cat owners, and other pet owners showed that all mean differences are statistically significant ($p<0.05$). The text discusses substantively significant results.

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