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## Pet Ownership may Attenuate Loneliness Among Older Adult Primary Care Patients Who Live Alone

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### Abstract

**Objectives**—Older adults who report feelings of loneliness are at increased risk for a range of negative physical and mental health outcomes, including early mortality. Identifying potential sources of social connectedness, such as pet ownership, could add to the understanding of how to promote health and well-being in older adults. The aim of this study is to describe the association of pet ownership and loneliness.

**Methods**—The current study utilizes cross-sectional survey data from a sample ( $N = 830$ ) of older adult primary care patients (age > 60 years).

**Results**—Pet owners were 36% less likely than non-pet owners to report loneliness, in a model controlling for age, living status (i.e., alone vs. not alone), happy mood, and seasonal residency (adjOR = 0.64, 95% CI = 0.41-0.98,  $p < .05$ ). An interaction was found between pet ownership and living status ( $b = -1.60$ ,  $p < .001$ ) in which living alone and not owning a pet was associated with the greatest odds of reporting feelings of loneliness.

**Conclusions**—Findings suggest that pet ownership may confer benefits for well-being, including attenuating feelings of loneliness and its related sequelae, among older adults who live alone.

### Keywords

older adults; loneliness; pet ownership; primary care

### Introduction

Loneliness—the subjective experience of feeling socially disconnected from others (Hawkley & Cacioppo, 2010)—is linked with a range of negative health outcomes, including coronary heart disease (Thurston & Kubzansky, 2009), Alzheimer's disease (Wilson et al., 2007), and depression (Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006). Loneliness is also associated with death by suicide (Van Orden & Conwell, 2011) and hastened mortality by other causes (Penninx et al., 1997; Olsen, Olsen, Gunner-Svensson, & Waldstrom, 1991). In 2010, Holt-Lunstad, Smith, & Layton conducted a

systematic review of the extant literature examining social relationships and mortality risk, and reported that poor quality of social relationships, of which loneliness is one manifestation, is linked to early mortality at a rate comparable to other well-established risk factors for death (e.g., smoking, obesity, and physical inactivity). Although this review included studies that examined the entire age spectrum, the physiological sequelae of loneliness appear to be more pernicious in older adults than in younger adults (Hawkley & Cacioppo, 2007).

The prevalence of loneliness among adults decreases across adulthood, but increases in very old age (i.e., >80 years; Pinquart & Sörensen, 2001). Of note, approximately 40% of adults age 65 years and older report being lonely at least part of the time (Hawkley and Cacioppo, 2010), and 5%-15% report frequent loneliness (Pinquart & Sörensen, 2001). It is important to highlight that loneliness is a subjective feeling. In fact, studies indicate that, although the number of social relationships decreases with age, the quality of the existing relationships greatly increases for most older adults (Charles & Carstensen, 2009). For others, however, this decrease in objective measures of social relationships may exacerbate subjective feelings of loneliness and its attendant health impacts. Given that older adults are the fastest growing segment of the United States population (Kinsella, Wan, & U.S. Census Bureau, 2008), loneliness may be seen as a potent public health problem (Cacioppo & Patrick, 2008). Identifying potential sources of social connectedness could inform interventions aimed at decreasing loneliness in older adults.

Several studies of older adults have hypothesized that pets may be a source of social connectedness that buffer against feelings of loneliness (for a review, see Barker & Wolen, 2008). Notably, intervention studies of older adults living in long-term care facilities have demonstrated that interactions with pets, through animal-assisted therapy (AAT), appear to reduce loneliness (Banks & Banks, 2002) and promote social behaviors (e.g., initiation of conversation; Bernstein, Friedmann, & Malaspina, 2000), effects that appear to be independent of increased human contact (Banks & Banks, 2005). In support of the hypothesis that pets are associated with a decreased level of loneliness are observational studies with samples of community-dwelling older women (Krause-Parello, 2012) and younger women who live alone (Zasloff & Kidd, 1994). One study found that older adults who are bereaved and report few confidants (family, friends, etc.) may be more likely to benefit from pet ownership in terms of fewer depressive symptoms than their bereaved peers who report a stronger social network (Garrity, Stallones, Marx, & Johnson, 1989). Thus, pet ownership may, in part, compensate for low (human) social connectedness. However, the association between pet ownership and loneliness is less clear with regards to the effect for men. For example, among a sample consisting of predominately male veterans who were receiving home nursing care, no differences on measures of psychological well-being were found between pet owners and non-pet owners (Robb & Stegman, 1983). Further, no studies have examined this association among primary care patients.

Given that primary care is a key setting for health promotion efforts in later life, the aim of this study is to describe the association between pet ownership and loneliness among older adult primary care patients, both men and women. As described above, previous studies indicate that pet ownership is associated with indices of belongingness, suggesting that pet

owners may be protected from loneliness. Thus, we hypothesize that older adults who own pets will be less likely to report loneliness than older adults who do not own pets. Further, consistent with previous research (Zasloff & Kidd, 1994; Goldmeier, 1986), we hypothesized that this relationship would be especially strong among older adults who live alone and thereby have fewer opportunities for human social exchanges (i.e., a pet ownership by living status interaction). In other words, we hypothesize a compensation (rather than capitalization) model for the effect of pet ownership in which pet ownership will (in part) compensate for having low belongingness to family, friends, etc.

## Methods

### Participants and Procedures

Participants for the current study were primary care patients age 60 years or older. Data were collected as part of screening for potential inclusion in an ongoing clinical trial of suicide prevention in older adults (Van Orden et al., 2013). During designated data collection days from March 2011 to August 2012, research staff members approached all patients 60 years or older in the waiting rooms of three primary care offices in the Rochester, NY area. Interested patients were handed both a letter from the office physicians that described the study and a self-report screening form that was filled out by the participant, unless physical limitations required the study staff member to administer the questionnaire orally. After the participant completed the screening form, the study staff member obtained basic demographic information, including age, gender, living status (i.e., alone or with someone else), and seasonal resident status. A seasonal resident is defined as a participant who is away from the Rochester, NY area for two or more months out of the year, thus resulting in ineligibility for the larger clinical trial from which this data were obtained. However, all patients who were screened are included in this study. This study was approved by the Institutional Review Board of the University of Rochester Medical Center.

### Measures

*Pet ownership* was assessed with the following question: “I have a pet” (0 = no, 1 = yes). *Loneliness* was assessed with the following question: “In the past two weeks, I have felt lonely,” with the following answer choices: “not true for me”, “somewhat true for me”, and “very true for me”. For the current study, the endorsement of either “somewhat true for me” or “very true for me” indicates the presence of loneliness. *Happy mood* was assessed with the following question, “I feel happy most of the time” and has the same answer choices as the loneliness questions; it is a single item from the Geriatric Depression Scale (Sheikh & Yesavage, 1986), adapted for the current study that serves as a proxy for unhappy/depressed mood. A response of “not at all true for me” indicates the presence of unhappy mood.

### Data Analytic Strategy

Data for the current study were analyzed in Stata Version 11.0 (StataCorp, 2009). To test for demographic differences between pet owners and non-pet owners, a combination of chi-squared and ANOVA analyses were employed. Logistic regression was used to test the association between pet ownership and the presence or absence of loneliness. In a subsequent model, we also used logistic regression to test an interaction between pet

ownership and living status (i.e., alone vs. with another human being). To interpret the form of the interaction, we plotted the probabilities of loneliness as a function of pet ownership separately for those who live alone or live with others, according to the recommendations of Cohen, Cohen, West, and Aiken (2003). We computed 4 regression equations for each point on the graph: pet owner/living alone, pet owner/not living alone, non-pet owner/living alone, and non-pet owner/not living alone.

## Results

Subject characteristics, including age, gender, and living status, are presented in Table 1. Overall, 830 patients (57.75% female, 37.88% living alone, 5.86% seasonal residents; mean age 72.24y, SD = 8.33y) who presented to their primary care physician participated; due to study staff error, data on age were missing for 75 participants. For the current study, participants were characterized as pet owners (56.14% female, 32.35% living alone, 4.23% seasonal residents; mean age 70.85y, SD = 7.98y) and non-pet owners (58.64% female, 40.94% living alone, 6.73% seasonal residents; mean age 73.00y, SD = 8.43y). Pet owners were significantly younger ( $F(1,753) = 11.62, p < .001$ ) and less likely to live alone ( $\chi^2 = 5.48, p < .05$ ) than non-pet owners. Due to these differences, both age and living status (i.e., alone versus not alone) were entered as covariates in subsequent models. Further, we made an *a priori* decision to enter seasonal resident status as a covariate into subsequent models because the travel demands of being a seasonal resident may be a barrier to pet ownership.

Overall, 260 patients (31.33%) reported feelings of loneliness in the previous two weeks. Among pet owners, 85/296 (28.72%) reported loneliness; among non-pet owners, 175/534 (32.77%) reported loneliness. In the model that examined our hypothesis—that pet owners would be less likely than non-pet owners to report loneliness—pet ownership was a significant predictor of the presence of loneliness, even after controlling for age, living status, seasonal status, and mood (adjOR = 0.64, 95% confidence interval [CI] = 0.41-0.98,  $p < .05$ ; see Table 2). In this model, pet owners were 36% less likely to report loneliness. Neither gender nor age was found to be a significant moderator of this result. However, there was a significant interaction between pet ownership and living alone ( $b = -1.60, p < .001$ ), such that the odds of loneliness depended on both pet ownership and living status, even after controlling for age, seasonal status, and mood (see Table 3). The form of the interaction indicated that living alone and not owning a pet was associated with the greatest odds of reporting feelings of loneliness (see Figure 1).

## Discussion

The goal of the current study was to describe the relationship between pet ownership and loneliness in a sample of older adults who presented to their primary care physician. Older adults who reported owning a pet were 36% less likely to report loneliness than older adults not reporting pet ownership. Further, an interaction effect was found, such that older adults who lived alone and did not own a pet were at increased odds of reporting loneliness. It is worth noting that, in our sample, gender was not found to be a moderator. Thus, owning a pet may attenuate feelings of loneliness for older adults, both men and women, and

particularly among those who live alone. This finding indicates that pets may function as a meaningful source of social connectedness.

Although the findings of this study cannot be interpreted causally given the cross-sectional nature of the data, it is possible that pets may buffer against feeling of loneliness by various means. Social connectedness is often thought of as the presence of meaningful connections with other human beings; however, in some instances, certain older adults may have their need for connectedness met, in part, by owning a pet. Notably, pets depend on their owners for survival, potentially giving their owner a sense of worth and responsibility for another living being. This is consistent with studies of human interactions, which show that providing support to others, rather than receiving it, may confer greater health benefits (Brown, Nesse, Vinokur, & Smith, 2003).

Caring for a pet also requires behavioral activation, such as walking or going to the veterinary office, which may precipitate interactions with other people and, by virtue of increased mobility, extend into other domains of health as well (e.g., Cutt, Giles-Corti, Knuiman, & Burke, 2007). For example, the health benefits of pet ownership have been demonstrated in studies on cardiovascular functioning and reactivity (Friedmann & Thomas, 1995; Allen, Blascovich, & Mendes, 2002), AIDS diagnosis and depression (Siegel, Angulo, Detels, Wesch, & Mullen, 1999), physical activity (Thorpe et al., 2006; Brown & Rhodes, 2006), and daily functioning levels (Raina et al., 1999). Further, older adults who own pets are also less likely to visit their physician (Siegel, 1990). Pets, therefore, may confer widespread health benefits for older adults.

It should be noted that loneliness is only a single indicator of health, and that pet ownership, if not managed properly, may actually be deleterious to the well-being of an older adult. For example, an older adult may place the well-being of their pet over the safety and health of themselves; they may pay for meals and veterinary services for their pet at the expense of their own meals or healthcare. In response, in 2006, the Meals on Wheels Association of America established an initiative—We All Love Our Pets—to provide meals to the pets owned by older adults they service (WALOP, 2012). Further, especially in an interpersonal dynamic whereby pets attenuate feelings of loneliness, issues of bereavement—of both the pet and its owner—must be considered (McNicholas & Collis, 2005). Although limitations of pet ownership do exist, careful planning could mitigate any negative consequences of pet ownership.

There are several limitations to this study. First, the sample consisted of older adults who presented to their primary care physician; thus, the results may not generalize to older adults who are more frail and/or non-treatment seeking, nor may the results generalize to other age groups. Second, the key construct—loneliness—was analyzed using a single dichotomous item; future research should employ a more nuanced measurement of loneliness. Third, this study assessed only whether a participant owned a pet or not, and did not consider other dynamics involved with that relationship (e.g., who had primary caretaking responsibilities of the pet). Given that owning a pet is different than actually caring for a pet (Peacock, Chur-Hansen, & Winefield, 2012; Garrity, Stallones, Marx, & Johnson, 1989), it could be that *caring for a pet* is associated with decreased odds of reporting loneliness. Similarly, an

additional limitation is that we do not have information on a previous loss of a pet, which could explain additional variance in feelings of loneliness; future research should assess this systematically. Fifth, we do not have data on the type of pet owned by each participant; previous studies suggest that owning a dog may confer different benefits than, for example, owning a bird (e.g., Zasloff, 1996). Finally, potential confounds of a relationship between pet ownership and health outcomes, including personality traits (Parslow, Jorm, Christensen, Rodgers, & Jacomb, 2005), attachment styles (Peacock, Chur-Hansen, & Winefield, 2012), and functioning levels were not examined, suggesting areas for future research. For example, it could be that older adults who own pets are more extroverted and/or have fewer disabilities and functional limitations, thereby simultaneously promoting both care for their pets and interactions with other human beings. This concern about physical health and functional status as a potential confounder for the association between pet ownership and loneliness is mitigated somewhat by our finding that pet ownership did not interact with age in its association with loneliness, indicating that it is not just at younger ages (i.e., when presumably fewer physical illness and functional impairments are present) that the association holds.

Despite these limitations, the principal findings—that pet ownership confers benefits for older adults, but that those benefits appear to be limited to those who live alone, thus supporting our compensation hypothesis—point to the need to better understand the mechanisms whereby pet ownership may attenuate loneliness. This could yield important information relevant to the prevention of loneliness among older adults who live alone. For example, for those older adults who report loneliness but who are unwilling or unable to engage in more traditional connectedness interventions, such as senior centers, volunteer activities, church activities, or friendly visiting programs, the effectiveness of providing pets could be systematically investigated. Given the deleterious health outcomes of loneliness on both physical and mental health, coupled with the changing demographics in the U.S. yielding increasing numbers of older adults who live alone, this research addresses a topic of significant public health significance that could translate into health promotion efforts.

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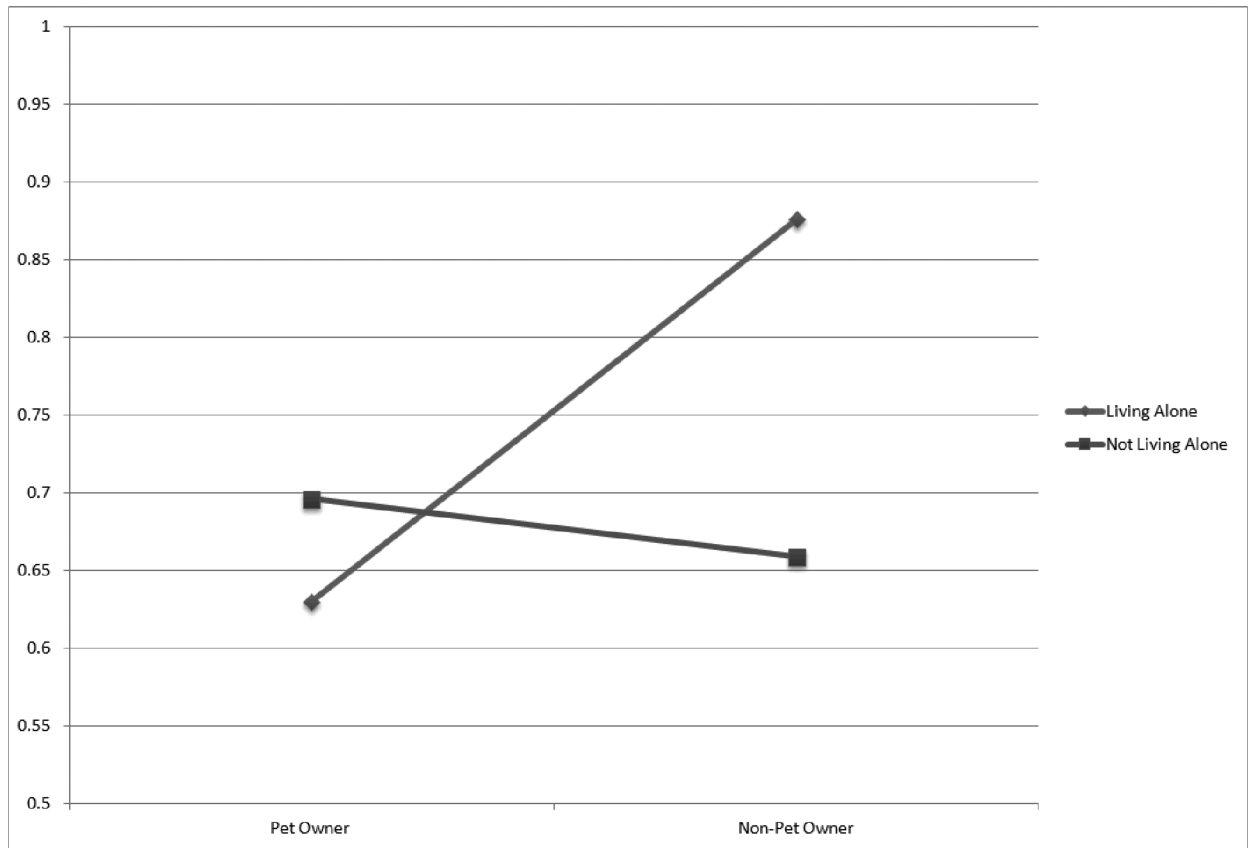
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**Figure 1.**

Probabilities of Loneliness as a Function of Pet Ownership and Living Status

*Note.* The interaction shown is adjusted for mood (coded as happy mood), age (mean age), and seasonal status (non-seasonal). The same pattern of results emerged when the graph was depicted with alternate codings of the covariates. Probabilities were calculated by the recommendation of Cohen, Cohen, West, and Aiken (2003): Probability =  $1 / (1 + \text{EXP}(-1 * (\text{logits})))$ .

**Table 1**

## Participant Characteristics

Characteristic	<i>n</i>	Pet owner <i>n</i> = 296 (%)	Not a pet owner <i>n</i> = 534 (%)	Group differences	All <i>n</i> (%)
Age <sup>a</sup>	755	70.85 (7.98)	73.00 (8.43)	$F(1,753) = 11.62, p < .001$	72.24 (8.33)
Gender	800				
Male		125 (43.86)	213 (41.36)	$\chi^2 = 0.47, p = ns$	338 (42.25)
Female		160 (56.14)	302 (58.64)		462 (57.75)
Living situation	763				
Alone		88 (32.35)	201 (40.94)	$\chi^2 = 5.48, p < .05$	289 (37.88)
Not alone		184 (67.65)	290 (59.06)		474 (62.12)
Seasonal status <sup>b</sup>	614				
Seasonal		9 (4.23)	27 (6.73)	$\chi^2 = 1.59, p = ns$	36 (5.86)
Non-seasonal		204 (95.77)	374 (93.27)		578 (94.14)
Loneliness	830				
Yes		85 (28.72)	175 (32.77)	$\chi^2 = 1.46, p = ns$	260 (31.33)
No		211 (71.28)	359 (67.23)		570 (68.67)

Note. Total *N*=830 patients included in analyses. The smaller *n*'s are a reflection of missing data due to study staff error.

<sup>a</sup> Age is calculated as a mean, so parentheses for the age row contain standard deviations (*SDs*).

<sup>b</sup> A seasonal resident is defined as a participant who is away from the Rochester, NY area 2 months out of the year. Assessing resident status began after the initial data collection started, due to a change in study protocol, which accounts for the smaller *n*.

**Table 2**

Logistic Regression Examining Pet Ownership, Living Status, Happy Mood, Age, and Seasonal Status as Predictors of Loneliness

Variable	OR (95% CI)	<i>b</i> (95% CI)	<i>p</i>
Pet ownership	0.64 (0.41-0.98)	-0.45 (-0.88--0.02)	0.041
Living status	2.19 (1.46-3.29)	0.78 (0.38-1.19)	0.000
Happy mood	0.21 (0.15-0.29)	-1.58 (-1.92--1.23)	0.000
Age	0.98 (0.96-1.01)	-0.02 (-0.04-0.01)	0.195
Seasonal status	0.55 (0.24-1.22)	-0.60 (-1.41-0.20)	0.141

LR  $\chi^2$  (5) = 135.10,  $p < 0.001$ ,  $N = 564$

*Note.* OR = odds ratio; CI = confidence interval; Pet ownership (1 = pet owner; 0 = not a pet owner); Living alone (1 = living alone; 0 = not living alone); happy mood is a binary variable indicating the presence/absence (1 = happy; 0 = not happy)

**Table 3**

Interaction Model—Logistic Regression Examining Pet Ownership, Living Status, Happy Mood, Age, Seasonal Status, and the Interaction of Pet ownership and Living Status as Predictors of Loneliness

Variable	OR (95% CI)	<i>b</i> (95% CI)	<i>p</i>
Pet ownership	1.19 (0.69-2.05)	0.17 (−0.37, 0.72)	0.538
Living status	3.66 (2.20-6.07)	1.30 (0.79, 1.80)	0.000
Happy mood	0.20 (0.14-0.28)	−1.62 (−1.97, −1.27)	0.000
Age	0.98 (0.96-1.01)	−0.02 (−0.04, 0.01)	0.138
Seasonal status	0.54 (0.24-1.23)	−0.61 (−1.43, 0.21)	0.144
Pet by alone	0.20 (0.08-0.50)	−1.60 (−2.49, −0.70)	0.000

LR  $\chi^2$  (6) = 147.68,  $p < 0.001$ ,  $N = 564$

*Note.* OR = odds ratio; CI = confidence interval; Pet ownership (1 = pet owner; 0 = not a pet owner); Living alone (1 = living alone; 0 = not living alone); happy mood is a binary variable indicating the presence/absence (1 = happy; 0 = not happy)

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