

**Enriching Lives: How Spending Time with Pets Is Related to the Experiential Well-being
of Older Americans**

Charlene M. Kalenkoski, Ph.D., CFP®¹ & Thomas Korankye, Ph.D., CFP®²

¹Department of Personal Financial Planning, Texas Tech University, Lubbock, Texas, USA

²Personal and Family Financial Planning, Norton School of Family and Consumer Sciences, The University of Arizona, Tucson, Arizona, USA

Corresponding Author

Charlene M. Kalenkoski, Ph.D., CFP®
Department of Personal Financial Planning
Texas Tech University
1301 Akron Avenue
Box 41210
Lubbock, TX 79409-1210
E-mail: charlene.kalenkoski@ttu.edu

ORCID

Charlene M. Kalenkoski: 0000-0003-0259-8723
Thomas Korankye: 0000-0001-6146-2725

Abstract

This study examines how caring for pets and walking, exercising, or playing with pets is associated with the experiential well-being of older Americans using activity-episode-level data from the 2010, 2012, and 2013 American Time Use Surveys (ATUS) and their associated Well-Being Modules (WBM). Estimating a series of ordered probit models that relate various measures of experiential well-being to different measures of pet-related activities, the results show that caring for pets is associated with greater meaning than other activities, controlling for a standard set of demographic and other person-level characteristics. Walking, exercising, or playing with household pets or animals is associated with greater happiness and meaning and less stress relative to other activities. The results from sensitivity analyses show that the

magnitudes of the associations for people who live alone are larger than for those who live with others.

Keywords: Pet care; time use; older adults; experiential well-being, Americans

Acknowledgements: The authors thank Nana Twum Owusu-Pepurah for excellent research assistance and Karen S. Hamrick and Sabrina Wulff Pabilonia for their valuable comments and suggestions.

Introduction

Time-use researchers examine what people do with their time and how this allocation of time affects their subjective well-being. In the United States, time-use researchers have examined data from the American Time Use Survey (ATUS) and its associated Well-being Modules (WBM) to examine the relationships between various measures of experiential well-being (happiness, sadness, tiredness, stress, pain, and meaning) and various activities such as performing mundane chores (Krueger 2007), engaging in job search (Krueger and Mueller 2012a, 2012b), and caregiving (Kalenkoski and Oumtrakool 2017; Kalenkoski, López Anuarbe, and Korankye 2020). Experiential well-being measures are distinct from other evaluations of well-being in the sense that they “capture affective reactions soon after they occur (Lucas, Freedman, and Carr 2019, p.1).” Most have focused on the time use of the general population (all ages), but Kalenkoski and Oumtrakool’s (2017) study focused specifically on the caregiving activities of older Americans.

Other data also have been used. Kalenkoski (2017) used similar time-use and well-being data from the Disability and Use of Time (DUST) Supplement to the Panel Study of Income Dynamics (PSID) to examine the relationships between older adults’ caregiving activities and their subjective well-being in the U.S. Kreuger et al. (2009) used similar data for much smaller samples of American and French people to examine how these relationships vary across countries.

However, one use of time that has been neglected by time-use researchers but may have a big impact on well-being is time spent in pet-related activities. According to the 2019-2020 National Pet Owners Survey, about two thirds of American households, representing nearly 85 million families, own pets, and average annual expenditure in the pet industry is over \$70 billion

(American Pet Products Association (APPA) 2020). The magnitude of these statistics suggests that people derive substantial value from owning pets.

This value may be physical, mental, and emotional (Siegel 1990; Kanat-Maymon 2016; Schreer and Bao 2016; Krause-Parello, Gulick, and Basin 2019; Mičková et al. 2019). Pets make their owners happy, reduce stress, foster togetherness in communities, and improve health (Bradshaw 2017). In addition, pets provide emotional support to people with mental conditions (Wang 2013) as well as those without mental issues (Feldman 2018). Pets also could help improve emotional well-being (Mičková et al. 2019).

Among older adults, bonding with pets could be important for protection against negative health outcomes such as strokes, heart disease, and depression (Aging in Place 2020). Pets also provide therapeutic support and help overcome boredom and loneliness among the elderly by fostering social interaction (Ballinger 2020). In general, pets are thought to be good for the well-being of older adults because they provide companionship, security, and calmness (Moeller 2010; Aging in Place 2020), which are important for successful aging. However, animals do not need to be pets to improve older adults' well-being. Krause-Parello, Gulick, and Basin (2019), reviewing the literature on human-animal interactions, indicate that benefits of such interactions for older adults include decreased loneliness and depression, improved cardiovascular health, and increased physical activity. Indeed, there is a recent handbook on animal-assisted therapy (Fine 2019) with an entire chapter on human-animal interaction and older adults (Johnson, Bibbo, and Harvey, 2019). In the United States, population aging is increasing the relevance of this issue (Enders-Slegers and Hediger 2019).

Literature Regarding the Benefits of Pets

Physical Health Benefits of Pets

Existing studies have examined several health and well-being outcomes associated with pet ownership. One of these is physical health. Allen et al. (2002) used a convenience sample of 120 married couples in the U.S. to show that pet ownership may be associated with improved cardiovascular health. Using data on 2,474 individuals who live alone from the U.S. National Health and Nutrition Examination Survey, Utz (2014) found positive relationships between pet ownership and self-rated health, physician-assessed health, and body mass index. Using self-administered questionnaires on a sample of 1,034 U.S. adults aged 65 and over, Siegel (1990) observed that pet owners are less likely to utilize physician services relative to non-pet owners. Mičková et al. (2019), using a small convenience sample of older adults in the Czech Republic (18 males and 26 females), found positive associations between dog ownership and minutes per week spent in physical activity, minutes per week spent walking, and calories spent per week. Dog owners reported higher scores in well-being measures, including general health, physical functioning, social functioning, pain, and vitality. Mičková et al. (2019) also observed that dog owners reported having lower BMIs. Overall, these health outcomes may occur because pet owners, especially individuals who own dogs, tend to engage in physical activity such as walking (Cutt et al. 2008; Toohey et al. 2013; Ballinger 2020).

Mental Health Benefits of Pets

The relationship between pet ownership and mental well-being also has been examined in the literature. Kanat-Maymon et al. (2016) examined pet ownership and its relationship to

psychological stress and well-being using information on 206 Israeli dog and cat owners aged 18 to 76. They also compared this relationship with that of having human significant others. The results showed that pets provided higher well-being (measured by life satisfaction, emotional ties, and positive affect) beyond that provided by significant others. Perhaps this is because pet owners perceive pets to be nonjudgmental, uncritical, and a source of belongingness or social support (Archer 1997; Kurdek 2008; Epley et al. 2008; McConnell et al. 2011).

Similar to the study by Kanat-Maymon et al. (2016), Wells and Rodi (2000) used data from the 1994 and 1995 Australia's Health Status and Older People survey to examine pet ownership and mental well-being. Their well-being measures included life satisfaction, positive affect, and negative affect. Relying on a sample of about 1,000 older adults aged 65 and over, they found no statistically significant relationships between pet ownership and the well-being measures of life satisfaction, positive affect, and negative affect among Australian older adults.

Emotional Benefits of Pets

Evidence of the relationships between pet ownership and depression and loneliness varies across samples and different measures of emotional well-being. Zasloff and Kidd (1994) showed, using a convenience sample of 148 single female university students in the U.S., that low levels of loneliness are associated with pet ownership. However, Wells and Rodi (2000), examining nearly 1,000 Australian older adults in the Health Status of Older People Survey, found no statistically significant relationship between loneliness and pet ownership. Using data on a sample of 132 Canadians, Antonacopoulos and Pychyl (2010) found that, while pet ownership is unrelated to the level of depression among people who live alone, having more human support together with pet ownership is associated negatively with loneliness. In the U.S.,

however, Stanley et al. (2014) found that pet ownership may attenuate loneliness among older adults who live alone.

Pikhartova, Bowling, and Victor (2014) used data on individuals aged 50 and over from several waves of the English Longitudinal Study of Ageing to examine how loneliness affects pet ownership and vice versa. They showed that the relationship exists for women only and goes both ways, with loneliness affecting pet ownership and pet ownership affecting loneliness.

Bennett et al. (2015) used Australian data on 68 older adults aged 65 to 88 and found a negative relationship between the frequency of pet contact and psychological well-being (loneliness, stress, anxiety, and depression). The authors reported that many of these relationships are observed for the presence of dogs but not for the presence of cats. Further, the authors did not find statistically significant relationships between the presence of pets and several other measures of psychological well-being and mood such as happiness, sadness, cheerfulness, boredom, and worry. Specifically comparing types of pets, Schreer and Bao (2016) found that dog owners appear happier than cat owners and that personality traits such as extraversion and agreeableness mediated the relationship between pet ownership and happiness.

Most recently, Carr et al. (2020) showed that, while a social loss such as the death of a spouse increases loneliness and depression, these effects are partially mitigated by having a companion animal.

Our Contributions to the Literature

Most of these existing studies on pet ownership and well-being used small and sometimes unrepresentative data sets. Many are also non-U.S. samples and there are cultural differences in how pets are perceived around the world, necessitating country-specific analyses. Our paper

uses a much larger sample that is representative of the United States' population. Also, while many of the prior studies examined the associations of well-being measures with pet ownership, this study focuses on people's actual daily pet-related activities (pet care and walking, exercising, and playing with pets), regardless of whether the pet is owned by the doer, and examines how participating in these activities relates to their experiential, emotional well-being (happiness, sadness, tiredness, stress, pain, and meaning).

In addition, while the existing literature examines an array of well-being measures, including life satisfaction, happiness, self-rated health, physical health, general health, physical functioning, social functioning, pain, vitality, body mass index, psychological stress, positive and negative affect, emotional ties, depression, loneliness, stress, sadness, cheerfulness, boredom, worry, and anxiety, most do not focus on experiential well-being. This study examines how six different experiential measures of well-being (happiness, sadness, tiredness, stress, pain, and meaning) are related to engaging in pet-related activities on a given day. In addition, while other studies examined respondents as the unit of observation, this paper examines an activity episode as the unit of observation and thus compares the well-being generated by an individual's pet-related activities to that individual's other activities on the diary day. Examining how pet-related activities compare to other activities in terms of the experiential well-being they generate is a novel approach in the literature.

Data

This paper uses data from the 2010, 2012, and 2013 American Time Use Surveys (ATUS) and their associated Well-being Modules (WBM) to examine the associations between

engaging in pet care and other pet-related activities and individuals' experiential well-being.¹ The use of these data to examine well-being in the U.S. has been proposed and supported by Kahneman et al. (2004) and Stone et al. (2018). The ATUS respondent and activity files; the WBM respondent, activity, and activity replicate weight files; and the Current Population Survey (CPS) files were used to create the analysis data set. The pet-engagement, demographic, and other person-specific variables were obtained from the ATUS and CPS files and the experiential measures of well-being and activity replicate weights came from the WBM files.

The ATUS and CPS are nationally representative surveys administered by the U.S. Bureau of the Census for the U.S. Bureau of Labor Statistics. The ATUS contains the activities and corresponding time use of each randomly selected individual aged 15 and over from each eligible household in the CPS. ATUS samples are drawn from CPS households after their final out-rotation from the CPS panel. Selected individuals are interviewed and asked to report on their activities for the 24 hours from 4 a.m. on the day prior to 4 a.m. of the interview day. For example, an individual may report an activity episode from 4 a.m. until 4:25 a.m. on the diary day that involved eating breakfast. Then the individual might report a different activity episode from 4:25 a.m. until 4:30 a.m. that involves brushing his teeth. The activity episodes would be collected in this order for the full diary day. Although an individual is interviewed over the phone only once about one diary day, ATUS interviews occur throughout the year, except Thanksgiving and Christmas.

¹ These three years are all similar in terms of the business cycle. They are all expansion years so there should be no business-cycle effects on time-use. However, year controls still are included in the models to control for any changes in macroeconomic conditions across the years and any other year-specific, unobserved factors affecting people's time use.

The National Institute on Aging sponsors the WBM component of the ATUS. All respondents to the ATUS are eligible for the WBM questions, although a small percentage choose not to answer these questions. Three randomly selected activity episodes from each ATUS participant's diary day are selected for inclusion in the WBM. Sleeping, grooming, and personal activities are not eligible for selection. For each of the randomly selected activity episodes, the WBM contains information about the type of activity being performed and six well-being measures that relate how a respondent reported he or she felt while performing each selected activity. These well-being measures include how much meaning a person derived from the activity and how much happiness, pain, sadness, stress, and tiredness he or she experienced during the activity.

This study focuses on individual respondents aged 50 and older. The unit of observation is an activity episode. To produce reliable statistical estimates that are representative of all activities, the survey's activity-level, replicate weights are applied using the successive difference replicates (SDR) estimation method. These weights control for the fact that there are multiple activity episodes reported per person. The number of activity-episode observations used in the empirical analysis is 39,713. These activity episodes are obtained from 13,635 WBM participants aged 50 and older.

In this study, the six experiential well-being measures (meaningfulness, happiness, pain, sadness, stress, and tiredness) from the WBM serve as the dependent variables. For each of three randomly selected, activity episodes per individual, the following questions are asked, "From 0 to 6, where a 0 means you were not happy at all and a 6 means you were very happy, how happy did you feel during this time? From 0 to 6, how meaningful did you consider what you were doing? 0 means it was not meaningful at all to you and a 6 means it was very meaningful to you.

From 0 to 6, where a 0 means you were not tired at all and a 6 means you were very tired, how tired did you feel during this time? From 0 to 6, where a 0 means you were not stressed at all and a 6 means you were very stressed, how stressed did you feel during this time? From 0 to 6, where a 0 means you were not sad at all and a 6 means you were very sad, how sad did you feel during this time? From 0 to 6, where a 0 means you did not feel any pain at all and a 6 means you were in severe pain, how much pain did you feel during this time if any?”

Four alternative measures of pet-related activity are the key explanatory variables. The first is an indicator variable for whether the reported activity is coded by the ATUS as “care for animals and pets (not veterinary care).” Examples included in the ATUS lexicon for this code include caring for household pets, cleaning up after pets, watching kittens/puppies being born, feeding/watering pets, petting animals, clipping cat’s claws, adopting a pet, visiting an animal shelter to select pet, clipping dog’s nails, bathing dog, changing dog’s water, feeding rabbit, feeding birds, grooming pets, feeding fish, grooming horse, feeding guinea pig, and brushing dog.² These activities are not paid activities. If they were work activities, they would be coded as work instead. We simplify our discussion by referring to “care for animals and pets (not veterinary care)” as “pet care.”

The second is an indicator variable for whether the reported activity is “walking, exercising, or playing with animals.”³ The ATUS lexicon for this code includes exercising pets, taking pets for a walk, walking the dog, playing with animals, and playing with the dog. These activities are not paid activities. If they were work activities, they would be coded as work instead. For simplicity, we refer to this activity as “walking, exercising, and playing with pets.”

² The ATUS 2013 lexicon code for this activity is 020601.

³ The ATUS 2013 lexicon code for this activity is 020602.

The third is the amount of time a person spends in pet care as defined above. If the activity episode is not pet care, 0 minutes is recorded. The fourth is the amount of time spent walking, exercising, or playing with pets as defined above during the activity episode. If the activity is not walking, exercising, or playing with pets or animals, 0 minutes is recorded.

In addition to the key explanatory variables of interest, the study includes additional demographic and economic controls commonly included in time-use studies to control for unmeasured preferences and constraints. These include age, gender, education, family income, number of children, number of household members, marital status, education, race, health status, Hispanic ethnicity⁴, and labor-force status. The paper also includes year dummies to control for year-specific unobserved factors such as survey issues and macroeconomic conditions that may affect behavior or well-being but cannot be controlled for directly.

Tables 1 and 2 contain the descriptive statistics for the dependent and explanatory variables, respectively. Recall that the unit of observation is an activity episode for each of these tables. Table 1 shows that 34% of activity episodes make their doer very happy and that 43% of activity episodes are very meaningful. Only 5% of activity episodes make the doer not at all happy and 7% of activity episodes are not meaningful. The percentages of activity episodes for which people reported being “not at all” in pain, sad, stressed, and tired are 60%, 74%, 55%, and 36% respectively. Conversely, the percentage of activity episodes for which people reported being very much in pain, sad, stressed, and tired is only 4%, 2%, 4%, and 6%, respectively.

Table 2 shows that about half of one percent of the randomly selected activity episodes are pet-related activities, and the mean amount of time spent on these pet-related activities per

⁴ Hispanics may be of any race. Because of their large representation in the population and the sample, Hispanic ethnicity is included as a demographic control in our models while other ethnicities are not.

day is 0.55 minutes (0.25 on pet care and 0.30 on walking, exercising, or playing with pets). However, the average time spent in pet care reported here includes numerous zeroes (as activities that are not pet-care activities take a value of 0 minutes). The average time spent in pet care for those who spend some time in this activity on their diary day is 49.40 minutes. Similarly, the average time spent for walking, exercising, or playing with pets for those who engaged in these activities on the diary day is 66.54 minutes.

The average age of older-adult respondents engaging in the activity episodes is 63. About 54% of activity episodes are performed by females, 63% are performed by married people, 85% are performed by white people, 49% are performed by people not in the labor force, 45% are performed by employed people, and 30% are performed by people who have at least a bachelor's degree. In addition, approximately 77% of activity episodes are performed by people who perceive their health status to be at least good.

Model

We estimate the following ordered probit model for each of the six measures of experiential well-being (i.e., meaning, happiness, sadness, tiredness, stress, and pain) and each of the four measures of pet-related activity (i.e., pet care dummy variable; pet walking, exercising, or playing dummy variable; minutes spent in pet care; and minutes spent in pet walking, exercising, or playing). Thus, there are 24 probits in all that are estimated (6 with the pet care dummy as the key explanatory variable, 6 with the pet walking, exercising, or playing with pets dummy as the key explanatory variable, 6 with the minutes spent caring for pets as the key explanatory variable, and 6 with the minutes spent walking, exercising, or playing with pets as the key explanatory variable):

$$WBM_i^* = \beta_0 + \beta_1 PetActivity_j + \beta_x X + e$$

$$WBM_i = \begin{cases} 0 & \text{if } WBM_i^* \leq u_0 \text{ (Not at all)} \\ 1 & \text{if } u_0 < WBM_i^* \leq u_1 \\ 2 & \text{if } u_1 < WBM_i^* \leq u_2 \\ 3 & \text{if } u_2 < WBM_i^* \leq u_3 \\ 4 & \text{if } u_3 < WBM_i^* \leq u_4 \\ 5 & \text{if } u_4 < WBM_i^* \leq u_5 \\ 6 & \text{if } WBM_i^* > u_5 \text{ (Very)} \end{cases}$$

where i refers to the particular well-being measure (i = happiness, meaning, pain, sadness, stress, and tiredness); j refers to the particular pet-related activity measure (j = pet care dummy variable; pet walking, exercising, or playing dummy variable; minutes spent in pet care variable; or minutes spent walking, exercising, or playing variable); WBM_i^* is the latent measure of well-being of type i ; WBM_i is the observed report of well-being of type i ; $PetActivity_j$ is the key pet-related explanatory variable; X refers to the matrix of control variables; B_0 and B_1 are scalar parameters to be estimated; B_x is a vector of parameters to be estimated. The error term, e , is assumed to follow the standard normal distribution.

We hypothesize that engaging in pet-related activity increases, rather than reduces, experiential well-being. Standard economic household production models (e.g. Becker, 1965) state that a person produces household commodities (such as a meal, a clean home, and quality children) with market-purchased goods and services and the household member's time. The person derives utility (i.e., happiness, satisfaction, or well-being) from these commodities and chooses the amounts of time and money he or she spends in producing them to maximize his utility subject to time and income constraints. This optimization problem results in a series of

demand functions for time use and goods and services. Time spent producing a commodity will depend on preference parameters, production technology, prices, and income. Thus, if one of the commodities that enhances well-being is pet quality or the person-pet relationship, one of the time-use-demand functions, then, is the time a person spends with pets. Thus, according to standard household production theory, engaging in pet-related activities should increase the well-being of an individual. Thus, β_1 is expected to be positive in all the models.

However, β_1 is the relationship between the pet-related activity and latent (unobserved) well-being. Because we want to know the relationship between the pet-related activity and observed well-being (reported as a number between 0 and 6 inclusive), marginal effects need to be calculated. These give the relationships between the pet-related activity and the probability of reporting a 0, the probability of reporting a 1, the probability of reporting a 2, and so on. Thus, marginal effects are presented in the results tables.

Results

The results showing the marginal effects and standard errors are presented in Table 3 for the pet-care indicator variable and Table 4 for the walking, exercising, or playing with pets indicator variable. In Table 3, the results show that engaging in pet care is associated with a 0.12 higher probability of reporting that the activity is “very meaningful” (i.e., a score of 6 on the meaningfulness scale) compared to other activities and a 0.07 higher probability of reporting being “not at all sad” during the activity (i.e. a score of 0 on the sadness scale) relative to other activities, controlling for demographic, health, economic, and other factors. All else held constant, the results in Table 4 show that walking, exercising, or playing with pets is associated with a higher probability of reporting being “very happy” by 0.16 and a higher probability of

reporting the activity as “very meaningful” by 0.16 compared to other activities. Walking, exercising, or playing with pets also is associated with a 0.17 higher probability of reporting “not at all” stressed compared to other activities.

The results for minutes spent are reported in Table 5 for the pet-care activity and Table 6 for the walking, exercising, or playing with pets activity. Table 5 shows that, all else held constant, an additional minute spent caring for pets, relative to other activities, is associated with a higher probability of reporting the activity to be “very meaningful” by 0.004 compared to other activities. Thus, increasing the minutes spent caring for pets to 10 is associated with an increase in the probability of reporting the activity to be “very meaningful” by 0.04. Compared to other activities, Table 6 indicates that an additional minute spent walking, exercising, or playing with pets is associated with higher probabilities of reporting “very happy” and “very meaningful” compared to other activities by 0.002 and 0.003, respectively. Thus, increasing the minutes spent walking, exercising, or playing with pets to 10 is associated with a higher probability of reporting “very happy” and “very meaningful” by 0.02 and 0.03, respectively. However, even though the analysis controls for age and health, Table 6 also shows that an additional minute spent walking, exercising, or playing with pets is associated with a higher probability of reporting the activity to be “very painful” by 0.0001, relative to other activities, and a lower probability of reporting it to be “not at all painful” by 0.0005. However, one could say that the magnitude of the marginal effect on pain is negligible compared to the marginal effects on happiness and meaning.

Sensitivity Analyses

Some evidence has been found that pet ownership may have a larger benefit for older adults who live alone (Stanley et al. 2014). Thus, this paper reports sensitivity analyses for a sample of people who live alone in Tables 7 to 10. The results for the indicator variables for pet activity are reported in Tables 7 and 8, while the results for minutes spent appear in Tables 9 and 10. Table 7 shows that pet care is associated with a higher probability of reporting that the activity is “very meaningful” by 0.25, compared to other activities. Relative to other activities, Table 8 indicates that walking, exercising, or playing with pets is associated with a higher probability of reporting “very happy” and “very meaningful” by 0.15 and 0.19, respectively. It also is associated with a lower probability of reporting being “very stressed” by 0.03 and a higher probability of reporting “not at all stressed” by 0.10 compared to other activities. However, walking, exercising, or playing with pets is associated with a higher probability of reporting the activity to be “very painful” by 0.06 compared to other activities and a lower probability of reporting the activity to be “not at all painful” by 0.16 compared to other activities.

With respect to time spent by the living-alone subsample, Table 9 shows that an additional minute spent engaging in pet care is associated with a higher probability of reporting that the activity is “very meaningful” by 0.01 compared to other activities. The results also indicate that an additional minute spent caring for pets is associated with higher probabilities of reporting being “very sad” by 0.0005 and “very stressed” during the activity by 0.0008. Table 10 shows that an additional minute spent walking, exercising, or playing with pets is associated with a higher probability of reporting “very happy” by 0.0031, “very meaningful” by 0.0026, and “very painful” by 0.0006.

The sensitivity analyses show that engaging in pet-related activities is associated with people's experiential well-being and that the associations are magnified for the living-alone subsample.

Conclusion

We examined the relationships between engaging with pets (care, playing, etc.) and various measures of emotional, experiential well-being for Americans aged 50 and over. The study used data from the 2010, 2012, and 2013 American Time Use Survey (ATUS) and the corresponding Well-Being Modules (WBM) for the analysis. The results supported our hypothesis that engaging with pets improves the well-being of older adults. In particular, caring for pets and walking, exercising, or playing with pets were found to be more meaningful activities than non-pet-related activities, on average, after controlling for various demographic and other factors. In addition, pet care is associated with less sadness compared to other activities, on average, and walking, exercising, or playing with household pets or animals is associated with more happiness and less stress, on average, than other activities. The results also indicate that more time spent caring for pets is associated with greater meaning relative to other activities, on average, after controlling for demographic and other factors. Similarly, spending more time walking, exercising, or playing with pets is associated with higher reported levels of happiness and meaning compared to other activities, on average. The estimated relationships between pet-related activities and various measures of well-being appear to be even stronger in magnitude for the living-alone subsample.

Overall, the findings of this study suggest that older adults derive happiness and meaning from engaging in pet-related activities and this helps to explain the prevalence of pet ownership in the U.S. However, even though health status of participants is controlled for in the analyses, walking, exercising, and playing with pets is associated with greater levels of pain than other activities on average, especially for the living-alone subsample of older adults. Thus, any benefits of engaging with pets in terms of happiness and meaning must be weighed against the potential costs of such engagement in terms of pain. Perhaps this may mean choosing animals that require less physical exertion or choosing animal visits over pet ownership. The well-being of the animals must be considered as well, especially if an older adult living alone has no one else to take care of his or her pet if he or she becomes sick or dies. One can review Anderson et al. (2015) for a detailed discussion of the barriers to pet care for older adults as well as potential remedies.

References

- Aging in Place (2020). Seniors and pets. <https://www.aginginplace.org/seniors-and-pets/>. Accessed 14 April 2020.
- Allen, K., Blascovich, J., & Mendes, W. B. (2002). Cardiovascular reactivity and the presence of pets, friends, and spouses: The truth about cats and dogs. *Psychosomatic Medicine*, 64(5), 727-739.
- American Pet Products Association (2020). Pet industry market size and ownership statistics. https://www.americanpetproducts.org/press_industrytrends.asp. Accessed 14 April 2020.
- Anderson, K. A., Lord, L. K., Hill, L. N. & McCune, S. (2015). Fostering the human-animal bond for older adults: Challenges and opportunities. *Activities, Adaptation & Aging*, 39(1), 32-42. DOI: 10.1080/01924788.2015.994447.
- Antonacopoulos, N. M. D., & Pychyl, T. A. (2010). An examination of the potential role of pet ownership, human social support and pet attachment in the psychological health of individuals living alone. *Anthrozoos*, 23(1), 37-54.
- Archer, J. (1997). Why do people love their pets? *Evolution and Human Behavior*, 18(4), 237-259.
- Bao, K. J., & Schreer, G. (2016). Pets and happiness: Examining the association between pet ownership and wellbeing. *Anthrozoös*, 29(2), 283-296.
- Balinger (2020). The healing power of pets for seniors. <https://www.agingcare.com/articles/benefits-of-elderly-owning-pets-113294.htm>. Accessed 14 April 2020.
- Becker, Gary (1965). A theory of the allocation of time. *The Economic Journal*, 75(299), 493-517.
- Bennett, P. C., Godber, T. L., Brown, C., & Trigg, J. (2015). An experience sampling approach to investigating associations between pet presence and indicators of psychological wellbeing and mood in older Australians. *Anthrozoös*, 28(3), 403-420.
- Blouin, D. (2012). Understanding relations between people and their pets. *Sociology Compass*, 6(11), 856-869.
- Bradshaw, J. (2017). The real benefits of pet ownership. *The Wall Street Journal*. <https://www.wsj.com/articles/the-real-benefits-of-pet-ownership-1509116398>. Accessed 14 April 2020.
- Carr, D. C., Taylor, M. G., Gee, N. R., & Sachs-Ericsson, N. (2020). Psychological health benefits of companion animals following a social loss. *The Gerontologist*, 60(3), 428-438.

- Cutt, Hayley E., Knuiiman, Matthew W., & Giles-Corti, Billie. (2008). Does getting a dog increase recreational walking? *The International Journal of Behavioral Nutrition and Physical Activity*, 5(17), 17.
- Enders-Slegers, M. J., & Hediger, K. (2019). Pet ownership and human–animal interaction in an aging population: Rewards and challenges. *Anthrozoös*, 32(2), 255-265.
- Epley, N., Akalis, S., Waytz, A., & Cacioppo, J. (2008). Creating social connection through inferential reproduction: Loneliness and perceived agency in gadgets, gods, and greyhounds. *Psychological Science*, 19(2), 114-120.
- Fine, A. H. (2019). *Handbook on animal-assisted therapy: Foundations and guidelines for animal-assisted interventions*. San Diego: Elsevier Science & Technology.
- Feldman, S. (2018). Alleviating anxiety, stress, and depression with the pet effect. ADAA. <https://adaa.org/learn-from-us/from-the-experts/blog-posts/consumer/alleviating-anxiety-stress-and-depression-pet>. Accessed 16 April 2020.
- Gee, N., Mueller, M., & Curl, A. (2017). Human-animal interaction and older adults: An overview. *Frontiers In Psychology*, 8, 1416.
- Johnson, R. A., Bibbo, J. L. , & Harvey, L. (2019). Human-animal interaction in the aging boom. In *Handbook on animal-assisted therapy* (pp. 249-260). Elsevier.
- Kahneman, D., Krueger, A. B., Schkade, D., Schwarz, N., and Stone A. A. (2004). Toward national well-being accounts. *American Economic Review: Papers and Proceedings*, 94(2), 429-434.
- Kalenkoski, C. M. (2017). Caregiving by older adults: Gender differences in well-being. In *Gender and time use in a global context: The economics of employment and unpaid labor*, edited by Connelly, R. & Kongar, E., Palgrave Macmillan, 271-282.
- Kalenkoski, C. M., López Anuarbe, M., Korankye, T. (2020). Differences in the experiential well-being of Hispanics and non-Hispanics engaged in elder care, unpublished manuscript.
- Kalenkoski, C. M. & Oumtrakool, E. (2017). The caregiving responsibilities of retirees: What are they and how do they affect retirees' well-being? *Applied Economics*, 49(13), 1298-1310.
- Kanat-Maymon, Y., Antebi, A., & Zilcha-Mano, S. (2016). Basic psychological need fulfillment in human-pet relationships and well-being. *Personality and Individual Differences*, 92, 69-73.
- Krause-Parello, C. A., Gulik, E. E., & Basin, B. (2019). Loneliness, depression, and physical activity in older adults: The therapeutic role of human-animal interactions. *Anthrozoös*, 32(2), 239-254. DOI: 10.1080/08927936.2019.1569906.

- Krueger, A. B. (2007). Are we having more fun yet? Categorizing and evaluating changes in time allocation. *Brookings Papers on Economic Activity*, 2007(2), 193-215.
- Krueger, A. B., Kahneman, D., Fischler, C., Schkade, D., Schwarz, N., and Stone, A. A. (2009). Time use and subjective well-being in France and the U.S. *Social Indicators Research*, 93, 7-18.
- Krueger, A. B., & Mueller, A. I. (2012a). The lot of the unemployed: A time use perspective. *Journal of the European Economic Association*, 10(4), 765-794.
- Krueger, A. B. & Mueller, A. I. (2012b). Time use, emotional well-being, and unemployment: Evidence from longitudinal data. *American Economic Review: Papers and Proceedings*, 102(3): 594-599.
- Kurdek, L. A. (2008). Pet dogs as attachment figures. *Journal of Social and Personal Relationships*, 25(2), 247-266.
- Lab, M. (2020). Why study aging? <https://www.hsph.harvard.edu/mair-lab/why-study-aging/>. Accessed 16 April 2020.
- McConnell, A. R., Brown, C. M., Shoda, T. M., Stayton, L. E., & Martin, C. E. (2011). Friends with benefits: On the positive consequences of pet ownership. *Journal of Personality and Social Psychology*, 101(6), 1239.
- McNicholas, J. (2014). The role of pets in the lives of older people: A review. *Working with Older People*, 18(3), 128-133.
- Mičková, E., Machová, K., Daďová, K., & Svobodová, I.(2019). Does dog ownership affect physical activity, sleep, and self-reported health in older adults? *International Journal of Environmental Research and Public Health*, 16, 3355.
- Moeller, P. (2010). 10 Reasons older people need pets. <https://money.usnews.com/money/retirement/slideshows/10-reasons-older-people-need-pets>. Accessed 16 April 2020.
- Pikhartova, J., Bowling, A., and Victor, C. (2014). Does owning a pet protect older people against loneliness? *BMC Geriatrics*, 14, 106.
- Siegel, J. M. (1990). Stressful life events and use of physician services among the elderly: The moderating role of pet ownership. *Journal of Personality and Social Psychology*, 58(6), 1081.
- Stanley, I. H., Conwell, Y., Bowen, C., & Van Orden, K. A. (2014). Pet ownership may attenuate loneliness among older adult primary care patients who live alone. *Aging & Mental Health*, 18(3), 394-399.
- Stone, A. A., Schneider, S., Krueger, A., Schwartz, J. E., & Deaton, A. (2018). Experiential wellbeing data from the American Time Use Survey: Comparisons with other methods

- and analytic illustrations with age and income. *Social indicators research*, 136(1), 359-378.
- Toohey, A. M., McCormack, G. R., Doyle-Baker, P. K., Adams, C. L., & Rock, M. J. (2013). Dog-walking and sense of community in neighborhoods: Implications for promoting regular physical activity in adults 50 years and older. *Health and Place*, 22, 75-81.
- Utz, R. L. (2014). Walking the dog: The effect of pet ownership on human health and health behaviors. *Social Indicators Research*, 116(2), 327-339.
- Wang, S. S. (2013). Rise in pets as therapy for mental conditions. *The Wall Street Journal*. <https://www.wsj.com/articles/rise-in-pets-as-therapy-for-mental-conditions-1383609937>. Accessed 16 April 2020.
- Wells, Y., & Rodi, H. (2000). Effects of pet ownership on the health and well-being of older people. *Australasian Journal on Ageing*, 19(3), 143-148.
- Zasloff, R. L., & Kidd, A. H. (1994). Loneliness and pet ownership among single women. *Psychological Reports*, 75(2), 747-752.

Table 1. Proportions of Activities Rated at Different Levels of Meaning, Happiness, Pain, Sadness, Stress, and Tiredness for the Full Sample

	0 (Not at all)	1	2	3	4	5	6 (Very)
Meaning	0.0660 (0.0022)	0.0236 (0.0012)	0.0488 (0.0018)	0.1264 (0.0034)	0.1250 (0.0032)	0.1809 (0.0041)	0.4293 (0.0056)
Happy	0.0508 (0.0022)	0.0222 (0.0015)	0.0497 (0.0022)	0.1492 (0.0035)	0.1619 (0.0038)	0.2269 (0.0046)	0.3394 (0.0053)
Pain	0.6001 (0.0055)	0.0727 (0.0028)	0.0839 (0.0029)	0.0885 (0.0030)	0.0689 (0.0027)	0.0492 (0.0024)	0.0368 (0.0021)
Sad	0.7422 (0.0048)	0.0662 (0.0025)	0.0577 (0.0026)	0.0580 (0.0023)	0.0337 (0.0018)	0.0227 (0.0017)	0.0195 (0.0015)
Stress	0.5519 (0.0057)	0.0949 (0.0032)	0.1038 (0.0029)	0.0994 (0.0031)	0.0673 (0.0025)	0.0475 (0.0027)	0.0351 (0.0021)
Tired	0.3583 (0.0052)	0.0877 (0.0033)	0.1316 (0.0043)	0.1591 (0.0039)	0.1221 (0.0030)	0.0856 (0.0030)	0.0556 (0.0024)

Notes: Data source is the 2010, 2012, & 2013 ATUS & WBM. The proportions are above the standard errors which are in parentheses. Survey replicate weights are applied at the activity level. N=39,713 activities.

Table 2. Means and Standard Errors for the Explanatory Variables – Full Sample

	Mean	Standard Error
Pet activity indicator variables		
Pet care	0.0052	0.0004
Walking, exercising, or playing with pets	0.0044	0.0004
Pet activity time-use variables		
Time spent on pet care (in minutes)	0.2549 ^a	0.0437
Time spent for walking, exercising, or playing with pets (in minutes)	0.2953 ^b	13.4561
Age	63.2358	0.0693
Age top coded indicator variable	0.0839	0.0026
Number of household members	2.2544	0.0142
Percentage living alone	0.2212	0.0043
Marital status indicator variables		
Married	0.6308	0.0057
Widowed	0.1272	0.0033
Divorced	0.1478	0.0037
Separated	0.0183	0.0015
Never married	0.0758	0.0028
Female (=1 if yes)	0.5364	0.0036
Highest education completed indicator variables		
Less than high school	0.1145	0.0037
High school	0.3400	0.0049
Some college	0.2471	0.0051
Bachelor's degree	0.1730	0.0045
Postgraduate degree	0.1255	0.0040
White race (=1 if yes)	0.8470	0.0037
Hispanic ethnicity (=1 if yes)	0.0835	0.0029
Labor force status indicator variables		
Unemployed	0.0323	0.0022
Employed	0.4544	0.0060
Not in labor force	0.4903	0.0061
Number of children under 18	0.1947	0.0075
Family income category indicator variables		
Less than \$50,000	0.5132	0.0056
\$50,000 to less than \$100,000	0.3062	0.0057
\$100,000 and over	0.1806	0.0052

Table 2. Means and Standard Errors for the Explanatory Variables – Full Sample (Continued)

	Mean	Standard Error
Health status		
Excellent	0.1468	0.0046
Very good	0.3120	0.0054
Good	0.3102	0.0054
Fair	0.1693	0.0044
Poor	0.0618	0.0029

Notes: Data source is the 2010, 2012, & 2013 ATUS & WBM. Survey weights at the activity level are applied. N=39,713 activities.

^aThe average time spent on pet care for those who engage in pet care on the diary day is 49.40 minutes.

^bThe average time spent for walking, exercising, or playing with pets, for those who engage in these activities on the diary day, is 66.54 minutes.

Table 3: Ordered Probit Marginal Effects of Pet Care on Experiential Well-being for the Full Sample

	Happy	Meaning	Pain	Sad	Stress	Tired
Not at all	-0.0001	-0.0351***	-0.0158	0.0745*	0.0325	0.0019
0	(0.0141)	(0.0081)	(0.0291)	(0.0407)	(0.0404)	(0.0347)
1	-0.0000	-0.0095***	0.0008	-0.0121	0.0001	0.0002
	(0.0038)	(0.0025)	(0.0014)	(0.0075)	(0.0004)	(0.0034)
2	-0.0001	-0.0172***	0.0018	-0.0135*	-0.0024	0.0001
	(0.0068)	(0.0049)	(0.0032)	(0.0079)	(0.0034)	(0.0017)
3	-0.0001	-0.0337***	0.0031	-0.0170*	-0.0057	-0.0002
	(0.0120)	(0.0103)	(0.0056)	(0.0096)	(0.0073)	(0.0042)
4	-0.0000	-0.0206***	0.0034	-0.0120*	-0.0067	-0.0005
	(0.0040)	(0.0075)	(0.0064)	(0.0063)	(0.0084)	(0.0094)
5	0.0001	-0.0088	0.0032	-0.0095*	-0.0074	-0.0007
	(0.0060)	(0.0056)	(0.0060)	(0.0049)	(0.0090)	(0.0119)
Very	0.0004	0.1248***	0.0034	-0.0105*	-0.0104	-0.0008
6	(0.0346)	(0.0380)	(0.0065)	(0.0049)	(0.0122)	(0.0145)

Notes: Data source is the 2010, 2012, & 2013 ATUS & WBM. The marginal effects are above the standard errors which are in parentheses. Survey replicate weights are applied at the activity level. ***indicates significance at 1% level; **indicates significance at 5% level; *indicates significance at 10% level. Each model includes the following continuous variables: age, number of household members, and number of children. In addition to the continuous variables, each model includes these indicator variables: female, education, family income, marital status, education, white race, Hispanic ethnicity, labor force status, health status, and year dummies as standard controls. For brevity, the results for these controls are not shown. N=39,713.

Table 4: Ordered Probit Marginal Effects of Walking, Exercising, or Playing with Pets on Experiential Well-being for the Full Sample

	Happy	Meaning	Pain	Sad	Stress	Tired
Not at all	-0.0437*** (0.0059)	-0.0428*** (0.0065)	-0.0603* (0.0337)	0.0331 (0.0330)	0.1660*** (0.0410)	0.0342 (0.0370)
0						
1	-0.0136*** (.0023)	-0.0119*** (0.0021)	0.0025* (0.0011)	-0.0050 (0.0053)	-0.0062 (0.0038)	0.0030 (0.0028)
2	-0.0260*** (0.0043)	-0.0219*** (0.0038)	0.0063* (0.0030)	-0.0058 (0.0060)	-0.0188*** (0.0068)	0.0012 (0.0007)
3	-0.0546*** (0.0095)	-0.0440*** (0.0085)	0.0114* (0.0060)	-0.0075 (0.0075)	-0.0327*** (0.0093)	-0.0046 (0.0057)
4	-0.0296*** (0.0069)	-0.0282*** (0.0065)	0.0132* (0.0074)	-0.0054 (0.0053)	-0.0338*** (0.0082)	-0.0093 (0.0101)
5	0.0058 (0.0036)	0.0147*** (0.0057)	0.0128* (0.0076)	-0.0044 (0.0043)	-0.0335*** (0.0072)	-0.0113 (0.0117)
Very	0.1617*** (0.0298)	0.1635*** (0.0315)	0.0142 (0.0089)	-0.0051 (0.0047)	-0.0409*** (0.0077)	-0.0131 (0.0129)
6						

Notes: Data source is the 2010, 2012, & 2013 ATUS & WBM. The marginal effects are above the standard errors which are in parentheses. Survey replicate weights are applied at the activity level. ***indicates significance at 1% level; **indicates significance at 5% level; *indicates significance at 10% level. Each model includes the following continuous variables: age, number of household members, and number of children. In addition to the continuous variables, each model includes these indicator variables: female, education, family income, marital status, education, white race, Hispanic ethnicity, labor force status, health status, and year dummies as standard controls. For brevity, the results for these controls are not shown. N=39,713.

Table 5: Ordered Probit Marginal Effects of Minutes Spent on Pet Care on Experiential Well-being for the Full Sample

	Happy	Meaning	Pain	Sad	Stress	Tired
Not at all	0.0000	-0.0013***	-0.0002	-0.0002	-0.0005	0.0003
0	(0.0002)	(0.0003)	(0.0006)	(0.0010)	(0.0009)	(0.0005)
1	0.0000	-0.0003***	0.0000	0.0000	-0.0000	0.0000
	(0.0001)	(0.0001)	(0.0000)	(0.0001)	(0.0000)	(0.0001)
2	0.0000	-0.0006***	0.0000	0.0000	0.0000	0.0000
	(0.0001)	(0.0001)	(0.0000)	(0.0002)	(0.0001)	(0.0000)
3	0.0000	-0.0010***	0.0001	0.0001	0.0001	-0.0000
	(0.0002)	(0.0002)	(0.0001)	(0.0002)	(0.0002)	(0.0001)
4	0.0000	-0.0005***	0.0001	0.0000	0.0001	-0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0001)
5	-0.0000	-0.0000	0.0001	0.0000	0.0001	-0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)
Very	-0.0001	0.0037***	0.0000	0.0000	0.0002	-0.0001
6	(0.0006)	(0.0009)	(0.0001)	(0.0002)	(0.0003)	(0.0002)

Notes: Data source is the 2010, 2012, & 2013 ATUS & WBM. The marginal effects are above the standard errors which are in parentheses. Survey replicate weights are applied at the activity level. ***indicates significance at 1% level; **indicates significance at 5% level; *indicates significance at 10% level. Each model includes the following continuous variables: age, number of household members, and number of children. In addition to the continuous variables, each model includes these indicator variables: female, education, family income, marital status, education, white race, Hispanic ethnicity, labor force status, health status, and year dummies as standard controls. For brevity, the results for these controls are not shown. N=39,713.

Table 6: Ordered Probit Marginal Effects of Minutes Spent on Walking, Exercising, or Playing with Pets on Experiential Well-being for the Full Sample

	Happy	Meaning	Pain	Sad	Stress	Tired
Not at all	-0.0010*** (0.0003)	-0.0011*** (0.0003)	-0.0005** (0.0002)	0.0005 (0.0005)	0.0016 (0.0010)	-0.0004 (0.0007)
0						
1	-0.0003*** (0.0001)	-0.0003*** (0.0001)	0.0000** (0.0000)	-0.0001 (0.0001)	0.0000 (0.0000)	-0.0000 (0.0001)
2	-0.0005*** (0.0001)	-0.0005*** (0.0001)	0.0001** (0.0000)	-0.0001 (0.0001)	-0.0001 (0.0001)	-0.0000 (0.0000)
3	-0.0008*** (0.0002)	-0.0008*** (0.0002)	0.0001** (0.0000)	-0.0001 (0.0001)	-0.0003 (0.0002)	0.0000 (0.0001)
4	-0.0003*** (0.0001)	-0.0004*** (0.0001)	0.0001** (0.0000)	-0.0001 (0.0001)	-0.0003 (0.0002)	0.0001 (0.0002)
5	0.0004*** (0.0001)	0.0000 (0.0001)	0.0001** (0.0000)	-0.0001 (0.0001)	-0.0004 (0.0002)	0.0001 (0.0002)
Very	0.0024*** (0.0006)	0.0031*** (0.0008)	0.0001** (0.0000)	-0.0001 (0.0001)	-0.0005 (0.0004)	0.0002 (0.0003)
6						

Notes: Data source is the 2010, 2012, & 2013 ATUS & WBM. The marginal effects are above the standard errors which are in parentheses. Survey replicate weights are applied at the activity level. ***indicates significance at 1% level; **indicates significance at 5% level; *indicates significance at 10% level. Each model includes the following continuous variables: age, number of household members, and number of children. In addition to the continuous variables, each model includes these indicator variables: female, education, family income, marital status, education, white race, Hispanic ethnicity, labor force status, health status, and year dummies as standard controls. For brevity, the results for these controls are not shown. N=39,713.

Table 7: Ordered Probit Marginal Effects on Pet Care on Experiential Well-being for the Living-Alone Subsample

	Happy	Meaning	Pain	Sad	Stress	Tired
Not at all						
0	-.0197258 .0175434	-0.0742*** (0.0093)	-0.0201 (0.0411)	.010268 .0780812	0.0015 (0.0693)	0.0173 (0.0413)
1	-.005054 .0047475	-0.0186*** (0.0030)	0.0007 (0.0013)	-.0010535 .0081839	-0.0000 (0.0015)	0.0008 (0.0018)
2	-0.0084 (0.0080)	-0.0300*** (0.0052)	0.0019 (0.0037)	-.0015622 .0120331	-0.0001 (0.0056)	0.0002 (0.0003)
3	-0.0130 (0.0131)	-0.0626*** (0.0120)	0.0037 (0.0073)	-.0022195 .0169658	-0.0002 (0.0106)	-0.0027 (0.0067)
4	-0.0032 (0.0041)	-0.0397*** (0.0092)	0.0043 (0.0087)	-.001583 .0120308	-0.0003 (0.0134)	-0.0045 (0.0108)
5	0.0061 (0.0046)	-0.0233** (0.0095)	0.0038 (0.0078)	-.0015129 .0114248	-0.0003 (0.0140)	-0.0050 (0.0118)
Very						
6	0.0433 (0.0428)	0.2484*** (0.0446)	0.0057 (0.0121)	-.0023369 .0174471	-0.0005 (0.0242)	-0.0061 (0.0140)

Notes: Data source is the 2010, 2012, & 2013 ATUS & WBM. The marginal effects are above the standard errors which are in parentheses. Survey replicate weights are applied at the activity level. ***indicates significance at 1% level; **indicates significance at 5% level; *indicates significance at 10% level. Each model includes the following standard controls: age (measured as a continuous variable), female, education, family income, marital status, education, white race, Hispanic ethnicity, labor force status, health status, and year dummies (measured as indicator variables). For brevity, the results for these controls are not shown. N=15,784.

Table 8: Ordered Probit Marginal Effects of Walking, Exercising, or Playing with Pets on Experiential Well-Being for the Living-Alone Subsample

	Happy	Meaning	Pain	Sad	Stress	Tired
Not at all	-0.0533*** (0.0112)	-0.0621*** (0.0110)	-0.1577** (0.0609)	0.0064 (0.0762)	0.1038* (0.0561)	-0.0039 (0.0485)
0						
1	-0.0152*** (0.0037)	-0.0149*** (0.0035)	0.0009 (0.0020)	-0.0007 (0.0079)	-0.0048 (0.0041)	-.0002045 (0.0026)
2	-0.0265*** (0.0066)	-0.0236*** (0.0051)	0.0092*** (0.0017)	-0.0010 (0.0116)	-0.0111 (0.0076)	-0.0001 (0.0011)
3	-0.0466*** (0.0137)	-0.0474*** (0.0119)	0.0240*** (0.0073)	-0.0014 (0.0165)	-0.0177* (0.0105)	0.0006 (0.0070)
4	-0.0177** (0.0074)	-0.0278*** (0.0090)	0.0332*** (0.0125)	-0.0010 (0.0117)	-0.0203* (0.0111)	0.0010 (0.0126)
5	0.0093*** (0.0028)	-0.0125* (0.0075)	0.0323** (0.0138)	-0.0009 (0.0112)	-0.0197** (0.0098)	0.0012 (0.0144)
Very	0.1500*** (0.0427)	0.1884*** (0.0458)	0.0581** (0.0288)	-0.0015 (0.0173)	-0.0304** (0.0138)	0.0015 (0.0182)
6						

Notes: Data source is the 2010, 2012, & 2013 ATUS & WBM. The marginal effects are above the standard errors which are in parentheses. Survey replicate weights are applied at the activity level. ***indicates significance at 1% level; **indicates significance at 5% level; *indicates significance at 10% level. Each model includes the following standard controls: age (measured as a continuous variable), female, education, family income, marital status, education, white race, Hispanic ethnicity, labor force status, health status, and year dummies (measured as indicator variables). For brevity, the results for these controls are not shown. N=15,784.

Table 9: Ordered Probit of Minutes Spent on Pet Care on Experiential Well-being for the Living-Alone Subsample

	Happy	Meaning	Pain	Sad	Stress	Tired
Not at all	0.0002	-0.0032***	-0.0001	-0.0022*	-0.0023*	-0.0004
0	(0.0003)	(0.0007)	(0.0005)	(0.0012)	(0.0012)	(0.0005)
1	0.0000	-0.0006***	0.0000	0.0002*	0.0001	-0.0000
	(0.0001)	(0.0001)	(0.0000)	(0.0001)	(0.0000)	(0.0000)
2	0.0001	-0.0009***	0.0000	0.0003*	0.0002*	-0.0000
	(0.0001)	(0.0002)	(0.0001)	(0.0002)	(0.0001)	(0.0000)
3	0.0001	-0.0016***	0.0000	0.0005*	0.0004*	0.0001
	(0.0002)	(0.0004)	(0.0001)	(0.0003)	(0.0002)	(0.0001)
4	0.0000	-0.0007***	0.0000	0.0003*	0.0005*	0.0001
	(0.0000)	(0.0002)	(0.0001)	(0.0002)	(0.0002)	(0.0001)
5	-0.0001	0.0002*	0.0000	0.0003*	0.0005**	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0001)
Very	-0.0003	0.0069***	0.0000	0.0005*	0.0008*	0.0002
6	(0.0007)	(0.0014)	(0.0001)	(0.0003)	(0.0004)	(0.0002)

Notes: Data source is the 2010, 2012, & 2013 ATUS & WBM. The marginal effects are above the standard errors which are in parentheses. Survey replicate weights are applied at the activity level. ***indicates significance at 1% level; **indicates significance at 5% level; *indicates significance at 10% level. Each model includes the following standard controls: age (measured as a continuous variable), female, education, family income, marital status, education, white race, Hispanic ethnicity, labor force status, health status, and year dummies (measured as indicator variables). For brevity, the results for these controls are not shown. N=15,784.

Table 10: Ordered Probit Marginal Effects of Minutes Spent on Walking, Exercising, or Playing with Pets on Experiential Well-being for the Living-Alone Subsample

	Happy	Meaning	Pain	Sad	Stress	Tired
Not at all	-0.0016*** (0.0004)	-0.0012** (0.0006)	-0.0024* (0.0013)	-0.0008 (0.0014)	0.0017 (0.0010)	0.0004 (0.0009)
0						
1	-0.0004*** (0.0001)	-0.0002** (0.0001)	0.0001* (0.0001)	0.0001 (0.0001)	-0.0000 (0.0000)	0.0000 (0.0000)
2	-0.0006*** (0.0002)	-0.0004** (0.0002)	0.0002* (0.0001)	0.0001 (0.0002)	-0.0001 (0.0001)	0.0000 (0.0000)
3	-0.0009*** (0.0002)	-0.0006** (0.0003)	0.0004* (0.0002)	0.0002 (0.0003)	-0.0003 (0.0002)	-0.0001 (0.0001)
4	-0.0002* (0.0001)	-0.0003** (0.0001)	0.0005* (0.0003)	0.0001 (0.0002)	-0.0003 (0.0002)	-0.0001 (0.0002)
5	0.0005*** (0.0014)	0.0001 (0.0000)	0.0004* (0.0002)	0.0001 (0.0002)	-0.0004 (0.0002)	-0.0001 (0.0003)
Very	0.0031*** (0.0008)	0.0026** (0.0012)	0.0006* (0.0003)	0.0002 (0.0003)	-0.0006 (0.0004)	-0.0001 (0.0003)
6						

Notes: Data source is the 2010, 2012, & 2013 ATUS & WBM. The marginal effects are above the standard errors which are in parentheses. Survey replicate weights are applied at the activity level. ***indicates significance at 1% level; **indicates significance at 5% level; *indicates significance at 10% level. Each model includes the following standard controls: age (measured as a continuous variable), female, education, family income, marital status, education, white race, Hispanic ethnicity, labor force status, health status, and year dummies (measured as indicator variables). For brevity, the results for these controls are not shown. N=15,784.