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Pets and Happiness: Examining the Association between Pet Ownership and Wellbeing

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ABSTRACT Are pets associated with happiness in their owners? Some research has demonstrated positive connections between pets and the physical health of their owners, and more recently, research has shown the beneficial effects of pets on the negative aspects of mental health as well. However, much less research has focused on the relation between pets and the positive aspects of mental health, such as happiness. In the current study, 263 American adults completed an online survey using Amazon Mechanical Turk. Results indicate that pet owners were more satisfied with their lives than non-owners, but did not differ on other wellbeing measures, personality measures, emotion regulation, or need satisfaction. Dog owners scored higher on all aspects of wellbeing compared with cat owners, and differed on a number of other measures, including the Big Five personality traits, emotion regulation strategies, and need satisfaction. The relationship between type of pet owned and wellbeing was mediated by the Big Five personality traits (extraversion, agreeableness, and neuroticism, specifically), emotion regulation strategy, and need satisfaction. In addition, self-identified “dog people,” relative to “cat people,” showed similar patterns to those of dog owners, but the effects were often smaller and non-significant. Although there may not be many differences between those who own pets and those who do not, clearly owning a dog is associated with beneficial outcomes. Implications and future directions are discussed.

Keywords: happiness, personality, pet ownership, subjective wellbeing



Pets are an important and ubiquitous part of life in the US. According to the Humane Society of the United States, 62% of American households have at least one pet (2012). But do they make us happy? In this paper, we will examine the relation between pet ownership and wellbeing, as well as the relation between types of pets and wellbeing.

Pet Ownership and Wellbeing

Much research has been conducted on the effects of pets on their owners' health (for reviews, see Friedmann, Barker and Allen 2011; Headey

and Grabka 2011), some showing that there can be benefits, from lower blood pressure (Allen, Shykoff and Izzo 2001) to increased survival rates following a heart attack (Friedmann and Thomas 1995).

Recently, researchers have focused on mental wellbeing, in addition to physical wellbeing. For example, some researchers have found that pet ownership is associated with lower levels of depression (e.g., Clark Cline 2010), while others have not found a relationship (e.g., Siegel et al. 1999), and a recent systematic review showed that there was no convincing evidence that pet ownership could alleviate loneliness (Gilbey and Tani 2015). However, little research has focused on the positive aspects of mental wellbeing, such as subjective wellbeing, or happiness. Those studies that have measured happiness have often found mixed findings (McConnell et al. 2011) or used very restricted samples, such as elderly participants (Ory and Goldberg 1983). In a nationally representative sample, the Pew Research Center found no differences between pet owners and non-pet owners in the percentage of people who identified themselves as “very happy” (Pew Research Center 2006). They also found no differences in happiness between cat and dog owners. Thus, more research is needed to clarify the relation between happiness and pet ownership.

Subjective wellbeing, or happiness, is comprised of three components: high overall life satisfaction, many positive emotions, and few negative emotions (Diener 1984; Diener, Lucas and Oishi 2002). No study involving pet ownership has yet examined all three components of wellbeing. One possible explanation for the contradictory findings in previous research is that only some components of wellbeing differ between those who own pets and those who do not. For example, pet owners and non-owners may differ in life satisfaction, but not emotions. By examining all three wellbeing components, we may gain a more complete understanding of the relationship between pets and wellbeing.

Potential Mediators

There are also a number of variables that could account for the relationship between pet ownership and wellbeing, such as personality, emotion regulation styles, and basic needs. The Big Five personality traits have been shown to be related to both pet ownership and pet preferences. One study found that pet owners were more extraverted and more conscientious than those who did not own pets (McConnell et al. 2011). In another study, researchers asked people whether they identified as a “cat person,” “dog person,” “both,” or “neither,” and found that dog people were more extraverted, agreeable, and conscientious, yet less neurotic and open than cat people (Gosling, Sandy and Potter 2010). Thus, both pet ownership and the type of pet people identified with were related to personality. Researchers have also found that wellbeing is related to personality, specifically that happiness is associated with greater extraversion and lower neuroticism (Costa and McCrae 1980). Thus, the Big Five personality traits, particularly extraversion and neuroticism, may serve as mediators of the relationship between pet ownership and wellbeing, and the type of pet owned (e.g., cat or dog) and wellbeing.

If differences exist in people’s experiences of positive and negative emotions, then how people regulate their emotions may explain why those differences exist. The happier group (e.g., pet owners) may be more likely to engage in reappraisal and less likely to engage in suppression. Cognitive reappraisal is a strategy in which people change their emotions by changing the way they think about the emotion-eliciting event (Gross and John 2003). Suppression involves dampening the strength of the emotional response once it has occurred. Research has shown that reappraisal is positively associated with wellbeing, and

suppression is negatively associated with wellbeing. Thus, differences in wellbeing between groups may be mediated by differences in emotion regulation strategies.

Another potential mediator is the degree to which people have met their basic needs. According to self-determination theory, people have three basic needs: competence, relatedness, and autonomy (Deci and Ryan 2000). Competence is defined as desire for mastery and the extension of one's skills. Relatedness is the desire to connect and feel close to others. Autonomy is the desire to feel independent and capable of making one's own choices. Research suggests that people whose life goals meet the basic needs of competence, relatedness, and autonomy experience greater wellbeing than those whose goals do not. McConnell and colleagues (2011) found that people who experienced greater social needs fulfillment (similar to relatedness) from their dog were happier and less depressed. Thus, people who have their relatedness needs met may be happier, and people who own pets (or even certain types of pets, e.g., dogs vs. cats) may be more likely to have their relatedness needs met. Therefore basic needs, and relatedness in particular, may be mediators of this relationship.

Anthropomorphism could also be a potential mediator. Some people are more likely to view nonhuman objects as having human qualities (Waytz, Cacioppo and Epley 2010). If pet owners are more likely to anthropomorphize objects, they may see their pets as human-like, and thus form close relationships with them, increasing their happiness. It may also be that certain types of pets elicit more anthropomorphic behaviors (e.g., talking to the animal, dressing the animal up) from their owners than others, which could influence people's happiness. In this way, anthropomorphism could serve as a mediator of the relationship between pet ownership and wellbeing, and also as a mediator of the relationship between type of pet and wellbeing.

Research Questions and Hypotheses

We had two main research questions and two hypotheses. First, are there differences in subjective wellbeing (i.e., happiness, life satisfaction, positive emotions, and negative emotions) between pet owners and non-pet owners? Second, are there differences in subjective wellbeing between cat owners and dog owners?

We hypothesized that, if there are differences in wellbeing between the groups then the following variables will mediate the relationship between pet ownership and wellbeing: Big Five personality traits, emotion regulation style, basic need satisfaction, and trait anthropomorphism. We also hypothesized that the following variables will mediate the relationship between dog or cat ownership and wellbeing: Big Five personality traits, emotion regulation style, basic need satisfaction, and anthropomorphism.

Methods

Participants

Participants were 263¹ (131 males, 131 females, 1 declined to respond) American adults recruited from Amazon Mechanical Turk (mTurk). Participants ranged in age from 19 to 68 years ($M = 34.87$ years, $SD = 10.46$). Participants were each paid \$3.

Procedure

Participants completed a series of questionnaires online. After answering questions about their wellbeing and personality, participants completed demographic questions, including a question about whether or not they owned a pet. Participants who did not own a pet were directed to answer one set of questions, and participants who did own a pet completed a longer series of questionnaires about their pet and pet ownership experience.

Materials

Subjective Happiness Scale: Participants completed the 4-item measure of subjective happiness, which consists of questions such as, “Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you?” (Lyubomirsky and Lepper 1999). Participants responded using a 1–7 Likert-type scale (scale anchors vary by question). Cronbach’s $\alpha = 0.93$.

Satisfaction with Life Scale: To assess life satisfaction, participants completed the 5-item Satisfaction with Life Scale (Diener et al. 1985). This scale includes items such as, “In most ways my life is close to my ideal,” and “The conditions of my life are excellent,” to which participants respond using a 1 (strongly disagree) to 7 (strongly agree) Likert-type scale. Cronbach’s $\alpha = 0.93$.

Modified Differential Emotions Scale: We assessed participants’ experiences of positive and negative emotions using the 21-item modified Differential Emotions Scale (Fredrickson et al. 2003). Participants were asked to indicate the degree to which they had experienced each set of three emotions (e.g., “amused, fun-loving, silly,” “angry, irritated, annoyed”) during the past week, using a 0 (never) to 4 (most of the time) Likert-type scale. Cronbach’s α indicated high reliabilities for both the positive emotion ($\alpha = 0.92$) and negative emotion ($\alpha = 0.91$) subscales.

Emotion Regulation Questionnaire: To assess emotion regulation strategies, we used the 10-item Emotion Regulation Questionnaire, which measures the degree to which people use reappraisal (e.g., “I control my emotions by changing the way I think about the situation I’m in”) and suppression (e.g., “I control my emotions by not expressing them”) emotion regulation strategies (Gross and John 2003). Participants respond using a 1 (strongly disagree) to 7 (strongly agree) Likert-type scale. Reliability was high for both of the subscales (Cronbach’s $\alpha = 0.91$ for reappraisal and $\alpha = 0.86$ for suppression).

Need Satisfaction: The basic needs of self-determination theory were assessed using the satisfaction items from the Balanced Measure of Psychological Needs Scale (BMPN; Sheldon and Hilpert 2012). Using a 1 (not at all) to 7 (very much) Likert-type scale, participants completed nine questions assessing their autonomy (e.g., “I felt that my choices were based on my true interests and values”), competence (e.g., “I felt that I was successfully completing difficult tasks and projects”), and relatedness (e.g., “I felt a sense of contact with people who care for me, and whom I care for”). Cronbach’s α was 0.83 for autonomy, 0.82 for competence, and 0.93 for relatedness.

Big Five Inventory: We assessed participants’ personality using the Big Five Personality Inventory (BFI; John, Donahue and Kentle 1991). The BFI is a 44-item measure in which participants are asked to rate the degree to which they see themselves as someone who, for example, “is talkative,” “has an active imagination,” “likes to cooperate with others,” using a 1 (disagree strongly) to 5 (agree strongly) Likert-type scale. The Cronbach’s α for each subscale was: 0.87 for agreeableness, 0.88 for conscientiousness, 0.91 for extraversion, for 0.91 for openness, and 0.93 for neuroticism.

Individual Differences in Anthropomorphism Questionnaire (IDAQ): We assessed trait anthropomorphism using the IDAQ (Waytz, Cacioppo and Epley 2010). This is a 30-item measure of the degree to which people view nonhuman objects as having human characteristics. Fifteen of the items measure participants’ tendency to anthropomorphize and 15 items are distractor

items, so for the analyses, we used only the anthropomorphism items. These include items such as, “To what extent does a television set experience emotions?” and “To what extent does the average fish have free will?” Participants responded using a 0 (not at all) to 10 (very much) Likert-type scale. Cronbach’s α for the anthropomorphism items was 0.84.

Pets As People Scale: Participants who owned pets were also asked about the degree to which they anthropomorphized their pets. This scale, constructed by the authors for this study, is a list of 15 Yes or No items assessing the extent to which participants view and treat their pets as people, such as “Do you celebrate your pets’ birthdays?” “Do you frequently talk to your pets?” “Have you ever dressed one of your pets up in clothes?” and “Does your pet show many human emotions?” Cronbach’s α for this scale was 0.76.

Pet-Related Questions: Pet-owning participants were also asked a number of additional questions about their pets, including what type they owned, how long they had owned them, and how many they owned. We also asked whether participants considered themselves a cat person, dog person, both, or neither, in an attempt to replicate findings from earlier research (Gosling, Sandy and Potter 2010).

Results

Comparing Pet Owners and Non-pet Owners

First, we compared the participants who owned pets and those who did not on a variety of measures. In our sample, 168 participants (64%) reported that they owned a pet and 95 participants (36%) reported that they did not own one. In terms of wellbeing, independent samples *t*-tests revealed that pet owners were significantly more satisfied with life than people who did not own pets, but there were no significant differences in happiness, positive emotions, or negative emotions (see Table 1). In terms of personality, there were no significant differences in any of the Big Five personality traits, emotion regulation strategies, trait anthropomorphism, need satisfaction, or demographic variables such as age. Women were more likely to own pets than men ($\chi^2_{(1)} = 3.98, p = 0.046, \phi = 0.13$).

We conducted a number of mediation analyses using bootstrapping procedures to compute a confidence interval around each of the indirect effects (Preacher and Hayes 2008). Using this method, if the confidence interval does not include zero, then a mediator is present. According to the analyses, none of the following mediated the relation between pet ownership and satisfaction with life: the Big Five traits, emotion regulation styles, need satisfaction, or trait anthropomorphism (see Figure 1 a–d for depictions of the models tested). In each analysis, the 95% bias-corrected bootstrap confidence interval for the total indirect effect crossed zero, indicating no mediation effect.

In sum, the answer to Research Question 1 (“Are there differences in subjective wellbeing between pet owners and non-owners?”) is unclear, as one aspect of wellbeing (life satisfaction) differs between pet owners and non-owners, but the other aspects of wellbeing do not. Hypothesis 1, that the Big Five personality traits, emotion regulation style, basic need satisfaction, and trait anthropomorphism will mediate the relationship between pet ownership and wellbeing, was not supported.

Comparing Dog Owners and Cat Owners

Next, we examined the pet owners more closely. We asked participants to identify their primary pet, and most of the sample (94%) identified a cat or a dog (40.5% cat, 53.0% dog, 2.4% bird, 1.8% small mammal, 0.6% reptile/amphibian, 0.6% fish, and 1.2% other). Thus, to compare

Table 1. Comparisons of pet owners and non-owners: Means, standard deviations, and independent sample *t*-test results.

Variable	Pet Owners	Non-Owners	<i>t</i>	<i>df</i>	<i>p</i>	<i>r</i>
	Mean (SD)	Mean (SD)				
Life Satisfaction	4.17 (1.60)	3.71 (1.64)	-2.15	245	0.032	0.14
Happiness	4.55 (1.52)	4.35 (1.56)	-0.98	250	0.329	0.06
Positive Emotions	3.17 (0.60)	3.12 (0.73)	-0.52	161.71*	0.607	0.04
Negative Emotions	2.10 (0.71)	2.19 (0.69)	0.95	247	0.344	0.06
Conscientiousness	3.93 (0.73)	3.85 (0.78)	-0.88	257	0.381	0.05
Neuroticism	2.79 (1.04)	2.70 (1.09)	-0.62	257	0.537	0.04
Extraversion	2.62 (1.00)	2.67 (0.99)	0.36	257	0.716	0.02
Agreeableness	3.83 (0.75)	3.72 (0.78)	-1.07	257	0.284	0.07
Openness	3.67 (0.78)	3.48 (0.93)	-1.64	166.98*	0.104	0.13
Trait Anthropomorphism	42.99 (20.09)	46.13 (20.45)	1.21	259	0.228	0.07
Reappraisal	5.03 (1.14)	5.25 (1.06)	1.54	257	0.125	0.10
Suppression	3.80 (1.49)	4.02 (1.49)	1.19	257	0.237	0.07
Autonomy	2.83 (0.89)	2.71 (0.90)	-1.06	254	0.288	0.07
Relatedness	2.60 (1.10)	2.38 (1.20)	-1.48	259	0.141	0.09
Competence	2.52 (0.85)	2.41 (1.02)	-0.87	259	0.383	0.05
Age	34.69 (9.62)	34.63 (11.65)	-0.04	246	0.965	0.002

*Degrees of freedom were adjusted due to a significant Levene's test, and therefore do not reflect an assumption of equal variances between groups. The listed *r* represents *r*_{effect size}, computed using the following formula:

$$r = \sqrt{\frac{t^2}{t^2 + df}}$$

wellbeing and other variables across animal type, we decided to focus on only dog and cat owners. Independent samples *t*-tests revealed significant differences in wellbeing and personality between cat and dog owners for most measures (see Table 2, left side).

We examined a number of mediators of the relation between type of pet owned and wellbeing (see Figure 1, a–e). First, using happiness as the dependent variable, the Big Five traits mediated the relationship between type of pet owned and happiness (total indirect effect = -0.55, *p* = 0.003, 95% bootstrap bias corrected CI = -0.92 to -0.19; see Table 3 for all mediation analyses results). The Big Five traits also mediated the relationship between type of pet owned and life satisfaction (total indirect effect = -0.45, *p* = 0.008, 95% CI = -0.78 to -0.11); positive emotion (total indirect effect = -0.21, *p* = 0.006, 95% CI = -0.36 to -0.06); and negative emotion (total indirect effect = 0.26, *p* = 0.004, 95% CI = 0.09 to 0.44). In particular, for all of the wellbeing variables, the 95% confidence intervals did not cross zero for the indirect effects of agreeableness and neuroticism. Dog owners were more agreeable and less neurotic, and agreeableness positively predicted wellbeing, whereas neuroticism negatively predicted wellbeing. For happiness, life satisfaction, and positive emotions, the 95% confidence intervals also did not cross zero for the indirect effect of extraversion. Dog owners were more extraverted, and extraversion positively predicted wellbeing. This indicates that these variables are mediators of the type of pet and happiness relationship. Dog owners' higher levels of wellbeing could be partially explained by their higher levels of agreeableness, extraversion, and lower levels of neuroticism.

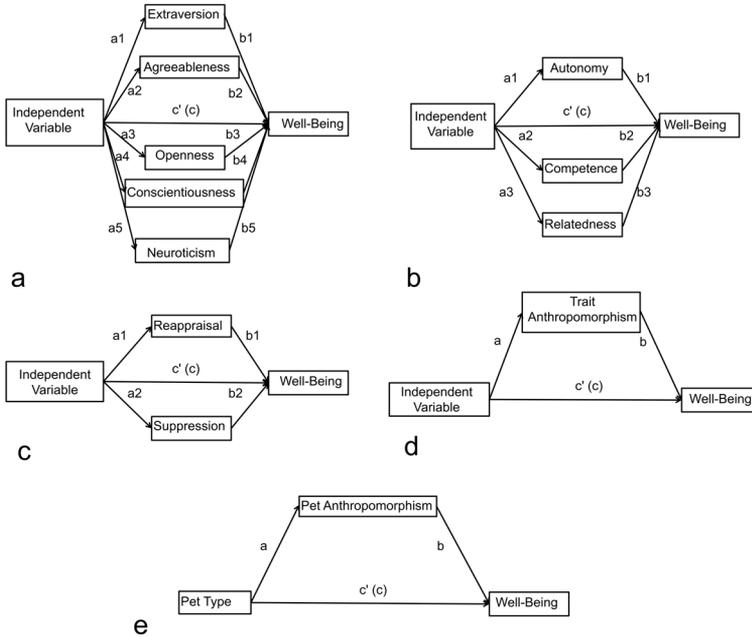


Figure 1. Mediation models with measures of wellbeing as the dependent variables. The independent variable differed by analysis, starting with pet ownership status (pet owners and non-owners), followed by type of pet (cat or dog), and finally, pet preference (cat or dog person). The analysis was repeated for each well-being variable (i.e., happiness, life satisfaction, positive emotions, and negative emotions). The a paths represent the effect of the independent variable on the mediator, and the b paths represent the effect of the mediator on the dependent variable (well-being). Multiplying $a \times b$ for each mediator gives the indirect effect of the independent variable on wellbeing for that variable. The c paths represent the total effect of the independent variable on wellbeing, and the c' paths represent the direct effect of the independent variable on wellbeing (i.e., the effect after controlling for the mediators).

Emotion regulation style was also a mediator of the relationship between type of pet owned and happiness (total indirect effect = -0.24 , $p = 0.03$, 95% CI = -0.50 to -0.04); life satisfaction (total indirect effect = -0.26 , $p = 0.023$, 95% CI = -0.53 to -0.006); positive emotions (total indirect effect = -0.13 , $p = 0.025$, 95% CI = -0.25 to -0.02); and negative emotions (total indirect effect = 0.08 , $p = 0.067$, 95% CI = 0.004 to 0.17). In each analysis, the 95% confidence interval did not cross zero for the indirect effect of suppression, but did cross zero for the indirect effect of reappraisal. Thus, suppression was a significant mediator, but reappraisal was not. Cat owners showed higher levels of suppression, and suppression predicted lower levels of wellbeing. Thus, cat owners' lower levels of wellbeing could be partially explained by their use of suppression to regulate their emotions.

Need satisfaction also mediated the relationship between type of pet owned and wellbeing for happiness (total indirect effect = -0.37 , $p = 0.043$, 95% CI = -0.72 to -0.007); positive emotions (total indirect effect = -0.19 , $p = 0.028$, 95% CI = -0.35 to -0.02); and negative emotions (total indirect effect = 0.16 , $p = 0.05$, 95% CI = 0.004 to 0.33). For each of these analyses, both relatedness and competence were mediators, as the 95% confidence intervals for their indirect effects did not cross zero. Dog owners had greater degrees of satisfaction of

Table 2. Comparisons of cat and dog owners, and cat and dog people: Means, standard deviations, and independent sample *t*-test results.

Variable	Dog Owner		Cat Owner		<i>t</i>	<i>df</i>	<i>p</i>	<i>r</i>	Dog Person		Cat Person		<i>t</i>	<i>df</i>	<i>p</i>	<i>r</i>
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)					Mean (SD)	Mean (SD)						
Life Satisfaction	4.44 (1.61)	3.79 (1.60)	2.45	147	0.016	0.20	4.34 (1.67)	3.85 (1.58)	1.53	101	0.128	0.15				
Happiness	4.81 (1.50)	4.11 (1.49)	2.89	151	0.004	0.23	4.73 (1.50)	4.17 (1.52)	1.93	104	0.056	0.19				
Positive Emotions	3.26 (0.56)	3.04 (0.64)	2.10	143	0.037	0.17	3.21 (0.58)	3.01 (0.63)	1.59	100	0.115	0.16				
Negative Emotions	1.94 (0.64)	2.30 (0.75)	-3.22	148	0.002	0.26	1.97 (0.70)	2.26 (0.72)	-2.08	103	0.040	0.20				
Conscientiousness	4.02 (0.68)	3.75 (0.80)	2.25	153	0.026	0.18	4.05 (0.71)	3.82 (0.80)	1.60	105	0.112	0.15				
Neuroticism	2.64 (1.06)	3.09 (1.06)	-2.61	153	0.010	0.21	2.52 (1.07)	3.06 (1.06)	-2.62	105	0.010	0.25				
Extraversion	2.72 (1.06)	2.44 (0.91)	1.73	153	0.086	0.14	2.70 (1.07)	2.43 (0.95)	1.33	105	0.185	0.13				
Agreeableness	3.92 (0.74)	3.70 (0.77)	1.81	153	0.072	0.14	3.86 (0.74)	3.65 (0.73)	1.48	105	0.143	0.14				
Openness	3.65 (0.74)	3.70 (0.81)	-0.37	153	0.711	0.03	3.66 (0.72)	3.62 (0.88)	0.23	105	0.817	0.02				
Trait Anthropomorphism	44.29 (21.96)	42.76 (19.37)	0.45	153	0.653	0.04	41.58 (18.29)	41.29 (19.27)	-0.08	104	0.937	0.008				
Pet Anthropomorphism	8.35 (3.08)	6.24 (2.49)	4.50	138.89*	< 0.001	0.18	8.38 (3.07)	6.31 (2.70)	3.50	94	0.001	0.34				
Reappraisal	5.17 (1.10)	4.93 (1.21)	1.32	154	0.188	0.11	5.05 (1.11)	4.94 (1.30)	0.46	105	0.647	0.04				
Suppression	3.48 (1.51)	4.02 (1.41)	-2.26	154	0.025	0.18	3.66 (1.45)	3.94 (1.45)	-1.01	105	0.316	0.10				
Autonomy	2.85 (0.88)	2.77 (0.97)	0.59	150	0.556	0.05	2.78 (0.87)	2.81 (0.92)	-0.19	102	0.853	0.02				
Relatedness	2.75 (1.07)	2.37 (1.18)	2.11	153	0.037	0.17	2.71 (1.07)	2.38 (1.15)	1.53	105	0.130	0.15				
Competence	2.64 (0.83)	2.33 (0.89)	2.24	153	0.027	0.18	2.56 (0.87)	2.41 (0.83)	0.90	105	0.370	0.09				

*Degrees of freedom were adjusted due to a significant Levene's test, and therefore do not reflect an assumption of equal variances between groups. The listed *r* represents *r*_{effect size}, computed using the following formula:

$$r = \sqrt{\frac{t^2}{t^2 + df}}$$

Table 3. Results of mediation analyses for type of pet owned as the predictor and wellbeing as the outcome.

	R^2	c	c'	a	b	a x b	R^2	c	c'	a	b	a x b
Happiness												
	Positive Emotions											
<i>Big Five</i>	0.56***	-0.67**	-0.13				0.56***	-0.20*	0.007			
Extraversion				-0.32*	0.43***	0.14 ^b				-0.37*	0.18***	-0.07 ^a
Agreeableness				-0.25*	0.50**	-0.13 ^b				-0.27*	0.25***	-0.07 ^a
Neuroticism				0.49***	-0.64***	-0.32 ^b				0.52**	-0.16***	-0.08 ^a
Openness				0.04	0.003	0.0001				0.02	0.15**	0.003
Conscientiousness				-0.26*	-0.12	0.03				-0.29*	-0.02	0.005
<i>Emotion Regulation</i>												
Reappraisal	0.21***	-0.69**	-0.45*	-0.28	0.38***	0.11	0.31***	-0.20*	-0.07	-0.30	0.19***	-0.06
Suppression				0.58*	-0.22	-0.13 ^b				0.55*	-0.13***	-0.07 ^a
<i>Need Satisfaction</i>												
Relatedness	0.52***	-0.66**	-0.30	-0.37*	0.62**	-0.23 ^b	0.68***	-0.21*	-0.02	-0.42*	0.24***	-0.10 ^a
Autonomy				-0.08	0.28*	-0.02				-0.12	0.19***	-0.02
Competence				-0.37**	0.32*	-0.12 ^b				-0.38**	0.16**	-0.06 ^a
<i>Trait Anthro.</i>				-2.40	0.004	-0.01	0.09**	-0.20*	-0.19*	-1.75	0.007**	-0.01
<i>Pet Anthro.</i>	0.04 ⁺	-0.61*	-0.64 ⁺	-2.11***	-0.02	0.03	0.05 ⁺	-0.23*	-0.17	-2.19***	0.03	-0.06
Life Satisfaction												
	Negative Emotions											
<i>Big Five</i>	0.38***	-0.62*	-0.17				0.60***	0.36**	0.10			
Extraversion				-0.30 ⁺	0.53***	-0.16 ^b				-0.35*	-0.03	0.009
Agreeableness				-0.27*	0.35*	-0.09 ^b				-0.23 ⁺	-0.21***	0.05 ^a
Neuroticism				0.47**	-0.47**	-0.22 ^b				0.48**	0.36***	0.17 ^a
Openness				0.02	-0.03	-0.0005				0.03	0.09	0.003
Conscientiousness				-0.30*	-0.10	0.03				-0.29*	-0.08	0.02
<i>Emotion Regulation</i>												
Reappraisal	0.18***	-0.62*	-0.35	-0.30	0.33	-0.10	0.18***	0.36**	0.28*	-0.22	-0.16***	0.04
Suppression				0.58*	-0.28**	-0.16 ^b				0.58*	0.08*	0.05 ^a
<i>Need Satisfaction</i>												
Relatedness	0.50***	-0.60*	-0.24	-0.39*	0.64***	-0.25 ^b	0.48***	0.36**	0.20*	-0.42*	-0.21***	0.09 ^a
Autonomy				-0.08	0.41*	-0.03				-0.11	-0.22**	0.02
Competence				-0.38**	0.20	-0.08				-0.36*	-0.13*	0.05 ^a
<i>Trait Anthro.</i>	0.04*	-0.61*	-0.60*	-2.23	0.006	-0.01	0.07**	0.36**	0.36**	-1.84	0.002	-0.003
<i>Pet Anthro.</i>	0.04 ⁺	-0.65 ⁺	-0.66 ⁺	-2.02***	-0.004	0.007	0.06 ⁺	0.34**	0.34**	-2.22***	0.003	-0.007

⁺ $p < 0.10$, ^{*} $p < 0.05$, ^{**} $p < 0.01$, ^{***} $p < 0.001$, ^bindicates the 95% bootstrap bias-corrected confidence interval did not cross zero, Number of bootstrap resamples = 5,000. Pet ownership variable coded as dog = 1, cat = 2. a = the effect of the independent variable on the mediator, b = the effect of the mediator on the dependent variable (wellbeing), a x b = the indirect effect of the independent variable on wellbeing, c = the total effect of the independent variable on wellbeing, and c' = the direct effect of the independent variable on wellbeing (i.e., the effect after controlling for the mediators).

their relatedness and competence needs, which was associated with higher levels of happiness and positive emotion, and less negative emotion. Need satisfaction did not mediate the relationship between type of pet owned and life satisfaction (total indirect effect = -0.36 , $p = 0.062$, 95% CI = -0.76 to 0.03). Even though the need satisfaction variables were not significant mediators, relatedness still appeared to mediate this relationship (see Table 3).

Neither trait anthropomorphism nor pet anthropomorphism were significant mediators of any of the wellbeing measures as outcome variables, as the 95% confidence interval for the total indirect effect crossed zero for each analysis.

In sum, the answer to Research Question Two (“Are there differences in subjective wellbeing between cat owners and dog owners?”) appears to be yes, that dog owners are happier than cat owners. Furthermore, Hypothesis Two, that the Big Five personality traits, emotion regulation style, basic need satisfaction, and anthropomorphism will mediate the relationship between dog or cat ownership and wellbeing, was partially supported. The Big Five personality traits, emotion regulation strategy, and need satisfaction mediated the relationship between type of pet owned and wellbeing; however, trait anthropomorphism and pet anthropomorphism did not mediate this relationship.

Comparing “Dog People” and “Cat People”

Next, we repeated the above analyses, but compared self-declared “dog people” and “cat people,” rather than those who reported owning a cat or dog. When asked whether they were a “cat person” or a “dog person,” 51 people (30%) chose “cat person,” 57 people (34%) chose “dog person,” 58 people (34%) chose “both,” and 3 people (2%) chose “neither.” We excluded those participants who answered “both” or “neither” for the following analyses. The findings were similar to those above, but fewer reached the significance threshold. There were no significant differences between cat and dog people in satisfaction with life or positive emotions, but dog people were marginally higher in happiness, and cat people were significantly higher in negative emotions (see Table 2, right side). Similarly, fewer differences were found in personality traits when comparing cat and dog people than when comparing cat and dog owners.

We examined a number of mediators of the relation between type of pet people identified with (i.e., “cat person” or “dog person”) and wellbeing. Emotion regulation strategy, need satisfaction, and trait anthropomorphism did not mediate the relationship between the type of pet people identified with and wellbeing. The Big Five personality traits were mediators of this relationship for happiness (total indirect effect = -0.57 , $p = 0.01$, 95% CI = -1.06 to -0.14); life satisfaction (total indirect effect = -0.49 , $p = 0.019$, 95% CI = -0.91 to -0.09); positive emotions (total indirect effect = -0.22 , $p = 0.014$, 95% CI = -0.42 to 0.05); and negative emotions (total indirect effect = 0.27 , $p = 0.011$, 95% CI = 0.07 to 0.50 ; see Table 4). In particular, the 95% confidence for the indirect effect of neuroticism did not cross zero. Dog people were less neurotic, and lower levels of neuroticism predicted higher levels of wellbeing. Pet anthropomorphism mediated the relationship between people’s pet preferences and positive emotions (total indirect effect = -0.12 , $p = 0.036$, 95% CI = -0.25 to -0.04 ; see Table 4). Dog people humanized their pets more than cat people, and humanizing one’s pet predicted higher levels of positive emotion. Thus, the relationship between pet preference and wellbeing could be at least partially explained by personality (neuroticism in particular) and the degree to which people anthropomorphized their pets.

In sum, similar to our findings with dog and cat owners, dog people reported higher levels of happiness and positive emotions than cat people. However, we did not find differences in

Table 4. Results of mediation analyses for type of pet people identified with as the predictor and wellbeing as the outcome.

	<i>R</i> ²	<i>c</i>	<i>c</i> '	<i>a</i>	<i>b</i>	<i>a</i> × <i>b</i>
Happiness						
<i>Big Five</i>	0.57***	−0.53 ⁺	0.04			
Extraversion				−0.27	0.46***	−0.130
Agreeableness				−0.22	0.38*	−0.090
Neuroticism				0.56**	−0.71***	−0.400 ^a
Openness				−0.03	−0.11	0.004
Conscientiousness				−0.20	−0.17	0.030
Life Satisfaction						
<i>Big Five</i>	0.39***	−0.45	0.04			
Extraversion				−0.27	0.56***	−0.150
Agreeableness				−0.22	0.32	−0.070
Neuroticism				0.56**	−0.47*	−0.270 ^a
Openness				−0.05	−0.20	0.010
Conscientiousness				−0.26 ⁺	0.04	−0.010
Positive Emotion						
<i>Big Five</i>	0.55***	−0.18	0.05			
Extraversion				−0.33	0.18***	−0.060
Agreeableness				−0.24 ⁺	0.23**	−0.060
Neuroticism				0.61**	−0.20**	−0.120 ^a
Openness				−0.03	0.12*	−0.004
Conscientiousness				−0.24	−0.06	0.020
<i>Pet Anthro.</i>	0.08*	−0.17	−0.05	−2.18***	0.06*	−0.120 ^a
Negative Emotion						
<i>Big Five</i>	0.58***	0.27 ⁺	0.002			
Extraversion				−0.30	−0.02	0.007
Agreeableness				−0.20	−0.22**	0.040
Neuroticism				0.56**	0.34***	0.190 ^a
Openness				−0.03	0.13*	−0.004
Conscientiousness				−0.25 ⁺	−0.14 ⁺	0.040

⁺*p* < 0.10, **p* < 0.05, ***p* < 0.01, ****p* < 0.001. ^aIndicates the 95% bootstrap bias-corrected confidence interval did not cross zero, Number of bootstrap resamples = 5,000. Pet person variable coded as dog = 1, cat = 2. *a* = the effect of the independent variable on the mediator, *b* = the effect of the mediator on the dependent variable (wellbeing), *a* × *b* = the indirect effect of the independent variable on wellbeing, *c* = the total effect of the independent variable on wellbeing, and *c*' = the direct effect of the independent variable on wellbeing (i.e., the effect after controlling for the mediators).

life satisfaction or negative emotions, though the effects were of similar magnitude to those of the “owners,” and were in the same direction. The Big Five personality traits, neuroticism in particular, mediated the relation between pet preference and wellbeing for all wellbeing variables, even those that did not show significant differences between groups. Also, pet anthropomorphism was a significant mediator of the relationship between pet preference and positive emotion, which did not appear in the pet-owner analyses.

Discussion

Overall, participants who owned pets and those who did not own pets did not appear to be very different in terms of wellbeing or personality. Pet owners were higher in satisfaction with life than non-owners, but the two groups did not differ in happiness, positive emotions, or negative emotions. What could account for this inconsistency among the wellbeing results? First, it is important to consider how long people had owned their pets. On average, participants reported owning their primary pets for 5.5 years ($SD = 3.88$ years, Range = 3 months–17 years). Thus, most people had owned their pet for a considerable amount of time, and may have adapted to the experience of owning the pet. Perhaps pet owners are happiest when they first adopt a pet, but then they gradually return to their baseline levels of wellbeing, a phenomenon known as hedonic adaptation (Frederick and Loewenstein 1999). Their pets may not be affecting their emotions and happiness in the same way a brand new pet might. As discussed earlier, life satisfaction is considered the cognitive component of wellbeing (Diener 1984). It may be that this cognitive aspect of wellbeing is more resistant to adaptation, because the pet owners are still considering their relationship with their pet when assessing their overall life satisfaction, but when it comes to their actual, day-to-day experience of emotions, the pet has little effect. Longitudinal research is needed to fully explore this question.

Next, we compared cat and dog owners, and found that dog owners had higher wellbeing. This relationship was mediated by some personality traits, such as extraversion, agreeableness, and neuroticism, but not others, such as anthropomorphism. However, personality alone does not explain why dog owners have higher wellbeing than cat owners. Dog owners were also less likely to use suppression, and had fulfilled their basic needs of competence and relatedness to a greater degree than cat owners. Suppression, competence, and relatedness were all significant mediators, helping to explain why dog owners were higher in wellbeing. Thus, it is not just personality that is explaining the differences in wellbeing between cat and dog owners.

When comparing dog and cat owners on the Big Five personality traits, our findings were similar to those of Gosling, Sandy and Potter's (2010) comparisons of cat and dog people, with the exception of openness. We found no differences in openness, whereas Gosling and colleagues found cat people to be higher on the trait. We also compared cat and dog people, but due to the large number of people who considered themselves both a cat and dog person (about one-third of the sample), who were dropped, the analyses comparing cat and dog people had less power than those comparing cat and dog owners. However, as shown in Table 2, the effects were nearly always in the same direction, even if they were not significant. The failure to attain significance cannot be entirely attributed to the smaller sample size, however, because some of the effects (e.g., need satisfaction and emotion regulation) also showed smaller effect sizes for the cat and dog people compared with the cat and dog owners. It may be, then, that actually owning a cat or dog, rather than considering oneself a cat person or a dog person, has a greater effect on some variables, such as need satisfaction, than on others, such as the Big Five personality traits, in which the effect sizes did not differ by much.

Limitations

One limitation of the current study is that for the analyses comparing cat owners and dog owners, we asked participants to report on their primary pet, but participants could have owned other species of pets including cats or dogs. Most participants (66%) reported owning only one species of pet, but we did not assess how many dog owners also owned cats

and vice versa. It would be interesting in future research to separate out and analyze the results for participants who own both species.

Another limitation is that many of our pet owners had owned their pets for a long period of time. Only six participants had owned their pet for less than one year, and the median length of ownership was 5 years. Pets may have the largest effects on wellbeing when they are first adopted into the family, so a sample with greater variability in ownership length or that focuses on adoption may provide further insight into the relationship between pets and wellbeing.

One of the biggest limitations of the current study is that we only assessed participants at a single time point. It is impossible to fully disentangle the complex relationships among wellbeing, personality, pet ownership, and the many other variables studied with a cross-sectional study. Longitudinal research is needed to expand upon the current findings.

Implications and Future Directions

In sum, this study suggests that pet owners and non-owners do not differ on most of the measures we assessed, including wellbeing and personality. So do pets not contribute to people's happiness? Such a conclusion cannot be drawn from this study alone. In order to truly understand how pet ownership and wellbeing are related, one must follow pet owners over time, to see how wellbeing changes. As discussed earlier, pet owners may experience a boost in wellbeing after adopting a pet, but gradually return to baseline levels of wellbeing in the period after adoption. Research focusing on adoption and measuring pet owners' wellbeing over time can test whether such an effect exists. Furthermore, if wellbeing does increase for a period after pet adoption, but then declines back to baseline levels, perhaps interventions can be introduced to slow or thwart the adaptation process, thus prolonging the joy of adding a new animal companion to the household. The fact that pet owners and non-owners do not differ in happiness in our sample does not necessarily mean that pets do not or cannot contribute to happiness.

Longitudinal research may also help explain the differences between cat and dog owners. Do happier people adopt dogs, or do dogs increase people's happiness? With a cross-sectional study, it remains unclear which way the causal arrow points for these relationships. Similarly, with personality for example, one could ask whether extraverts seek out dogs, or whether dogs make people more extraverted? Likely, with each of these relationships, it is a combination of both. Extraverts may be more drawn to dogs than cats, due to dogs' more sociable and energetic nature. Also, dogs may make people more extraverted because people may start taking their dog for walks around the neighborhood and start interacting with neighbors to a greater degree than they did before owning a dog. Thus, these relationships are likely complicated and cannot be reduced to a simple recommendation to adopt a dog as a way of increasing one's happiness. Longitudinal research, or even experimental research, where people are randomly assigned to receive a cat or dog, could help clarify these relationships.

Notes

1. We recruited 395 participants total, but 132 were dropped due to missing all or most of their data because of a website malfunction during one day of data collection.

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