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A Time to Say Goodbye: Empathy and Emotion Regulation Predict Timing of End-of-Life Decisions by Pet Owners

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Little is known about how pet owners make end-of-life (EoL) decisions regarding their pets. We analyzed data from 1542 pet owners from North America and Europe that had made EoL decisions involving their dogs (n = 546) or cats (n=996). We measured participants' empathy towards animals, emotion regulation, and attitudes toward pets, and asked for demographic information about themselves and the most recent pet that they had euthanized. We asked them to indicate a preference for making a decision too early versus too late, the stage of an illness or injury at which they had made their decision to euthanize, and the amount of guilt they felt for making a decision too early and too late. We hypothesized that individuals with high levels of empathy would prioritize the reduction of their pet's suffering and would therefore make earlier decisions and feel greater guilt for having made decisions too late. This might be especially true for those with low emotion regulation as they might have more difficulty managing their own distress related to the pet's condition. In addition, we recognized that pet owners would also consider their desire to extend the pet's life - particularly when they had strong positive attitudes toward pets. Contrary to our predictions, those with higher reported empathy for animals were more likely to make decisions to euthanize at later stages compared to earlier stages. Cat owners made decisions later compared to dog owners. Higher levels of empathy and lower levels of emotion regulation predicted guilt for both early and late decisions. Further work is needed to explore how various owner characteristics impact EoL decisions. Our study makes a first attempt to understand this complex issue.

Keywords: euthanasia, dog, cat, empathy, emotion regulation, guilt

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It is widely believed that companion animals bestow many benefits for physical and mental health upon their caregivers (e.g., Barker & Gee, 2021; Gee et al., 2021; Kaufman & Kaufman, 2006; Marsa-Sambola et al., 2017; McConnell et al., 2011; O'Haire, 2010) although results can be mixed (Albright et al., 2022; Barroso et al., 2021). Given the relatively shorter lifespans of pets compared to humans, one of the most difficult aspects of pet ownership can be the need to make end-of-life (EoL) decisions. Although caregivers are fortunate in being able to make EoL decisions to end the suffering of an elderly or diseased pet, which they typically cannot do for human companions (Leary et al., 2020; Sanders, 1995), there is no guidebook for the optimal moment to make such decisions. Although researchers have actively explored the topic of grief following euthanasia (e.g., Adrian & Stitt, 2019; Lagoni, 2011; Littlewood et al., 2020; McCutcheon & Fleming, 2002; Testoni et al, 2017; Thomas, 1982; Tzivian et al., 2014), and some studies have explored how veterinarians make euthanasia decisions (e.g., Sanders, 1995; Shaw & Lagoni, 2007), there is very little research regarding what factors influence pet owners' decisions regarding euthanasia. What sparse research does exist typically adopts a qualitative approach to identify environmental factors and attitudes underlying decisions to euthanize (Bussolari et al., 2018; Littlewood et al., 2021a, 2021b; Niessen et al. 2017; Tzivian et al., 2014). Previous research has not examined pet owner characteristics specifically regarding how they influence the *timing* of EoL decisions regarding companion animals. This is particularly important because research has shown that the decision to euthanize is the strongest predictor of intense grief following the loss of a companion animal (Davis et al., 2003). Furthermore, pet owners can experience significant guilt and self-blame after making such decisions (Hewson, 2014; Wong et al., 2017).

Qualitative research has revealed a common theme of conflict between owner versus pet concerns when making EoL decisions (Littlewood et al., 2021; Moore, 2011; Niessen et al. 2017; Sanders, 1995; Schuurman, 2017). Typically, this conflict is expressed in weighing concerns about pet health and suffering alongside concerns about the financial costs and emotional burden of caring for the pet on the owner (e.g., Spitznagel et al., 2017). For example, Littlewood and colleagues (2021) noted that a sample of 14 cat owners in New Zealand voiced human-centered and animal-centered concerns when interviewed about EoL decisions for their elderly and chronically ill cats. Human-centered concerns focused on the management of euthanasia, including the timing and finding a good veterinarian. Even within pet focused concerns, owners must weigh the suffering of the pet against the desire to extend the pet's life (Sanders, 1995; Schuurman, 2017; Tzivian et al., 2014). Previous studies have not examined individual owner characteristics that might predict timing of euthanasia decisions. Although we recognize that there are many reasons that owners consider the euthanasia of pets other than illness or suffering, we were interested in individual traits that might predict differential weighing of the reduction of suffering and the extension of life as factors predicting the timing of EoL decisions. Therefore, our study focused on euthanasia in the context of degenerative disease or age.

We were particularly interested in how individual differences in traits like empathy and emotion regulation would interact to predict the weighing of the concerns and the preferred timing for EoL decisions. Researchers have acknowledged that emotion management is important both for veterinarians and pet owners during the process of making EoL decisions (Morris, 2012). We hypothesized that relatively higher levels of empathy would lead caregivers to make earlier decisions to euthanize because these individuals would want to reduce the suffering of their animal companions. Indeed, the difficulty in seeing their pet suffering was a primary reason for euthanasia given by Israeli pet owners (Tzivian et al., 2014). The ability to recognize suffering might in itself require empathy. For example, empathy was the best predictor of perception of pain in dogs for

Norwegian dog owners (Ellingsen et al., 2010) and pain is one of the most important predictors of welfare (Broom, 2019). However, empathy leads to different outcomes depending on the individual's ability to cope with observing another in distress. Individuals can either direct affective responses to themselves, which results in anxiety and distress, or toward the distressed other, which leads to sympathy (Batson, 1998). We predicted that individuals with high empathy and poor emotion regulation would be inclined to make earlier decisions to reduce their own distress when dealing with an animal in declining health. Individuals high in empathy but also high in emotion regulation might be better able to cope with their own distress and place greater emphasis on extending the animal's life.

Recognizing the complexity of euthanasia decisions, we also considered how attitudes toward pets would potentially moderate these associations between empathy, emotion regulation, and EoL decisions. Ellingsen et al. (2010) identified attachment to pets, attitudes toward animals, and empathy for animals as among the five key factors for the human-dog relationship, along with anthropomorphism and belief in animal minds. Empathy is highly associated with attachment to pets (Melson 1991; Poresky 1996; Vizek Vidović, et al., 1999), which is highly correlated with pet attitude scores (Brown et al., 1996; Ellingsen et al., 2010; Hawkins et al., 2017). Greater attachment to pets is related to better care and welfare (Marsa-Sambola et al., 2016; Muldoon et al., 2016), as well as to feeling upset and wanting to assist an animal in distress (Ellingsen et al., 2010). Positive attitudes toward animals are also associated with more humane treatment, more concern for animal welfare, and less cruelty (Hawkins et al., 2005; Taylor & Signal, 2005). In a Korean sample, positive pet attitudes were associated with several medical outcomes related to the welfare of pet dogs. Some of these outcomes were beneficial to the dogs' welfare, such as veterinarian visits and vaccinations, but some were detrimental, such as the frequency of obesity (Kim et al., 2020). Stronger attachments to pets have been associated with more intense grief (e.g., Brown et al., 1996; Field et al., 2009; Gosse & Barnes, 1994; Park & Jeong, 2022; Schmidt et al., 2018), which led us to predict that attachment could lead to later EoL decisions to stave off anticipatory grief (Brockman et al., 2008; Fernandez-Mehler et al., 2013; Hewson, 2014; Shaw & Lagoni, 2007). We predicted that more positive attitudes towards animals in general might mitigate against the inclination to euthanize earlier in the stage of illness because these traits would be linked to placing a higher value on the pet's life and a greater desire to extend that life. Better understanding the characteristics and factors that influence pet owner's decisions about when to euthanize pets may help facilitate effective communication between veterinary professionals and owners facing such decisions.

There is an absence of research explicitly examining cultural differences in attitudes toward pet euthanasia, although societal attitudes toward pet death are known to influence duration and intensity of grief (Adams et al., 1999; Gosse & Barnes, 1994; Planchon & Templer, 1996). We thought that American and European (primarily Dutch and Flemish) respondents might differ in their decision making because of differing attitudes regarding euthanasia with Dutch and Flemish citizens tending to be stronger proponents of euthanasia, even for humans, compared to American citizens (Deak & Saroglou, 2017; van Tol et al., 2012). Furthermore, Americans and Europeans differ about practices regarding the pets' freedom of movement with American pet owners being more likely to keep their cats exclusively indoors (e.g., Bouma et al., 2021; Foreman-Worsley et al., 2021). Therefore, we surveyed 1542 cat and dog owners in both North America (primarily the United States) and Europe (primarily the Netherlands and Belgium) regarding their attitudes toward their pets, empathy, emotion regulation, and decisions regarding EoL for their pets. We focused on cats and dogs rather than other types of pets because dogs and cats are the most common

types of pet and more likely to be euthanized compared to some other types of pet. Although we gathered data from pet owners who had and had not had experience euthanizing pets, here we restricted our analyses to those who had made the difficult decision to euthanize at least one pet.

Method

Participants

A total of 2381 participants started the questionnaire. Participants who answered less than 75% of the questions (N = 390) and/or did not (strongly) agree with the statement 'I paid attention to the questions, and you should use my data' (N = 63) and/or failed at least two attention check questions (N = 99) were excluded. Significantly more men than women were excluded while significantly fewer participants of the Dutch cohort were excluded after data cleaning. The latter makes sense as they actively volunteered to be in the cohort and participate in research about cats. Of the sample of 1840, 1542 respondents had actually made the decision to euthanize their pet dog or pet cat (27% had to make this decision within the last year, 45% between one and five years ago, and 28% more than five years ago). The final sample for analysis consists of these 1542 participants of which 996 (63.6%) answered questions about the euthanasia of their cat and 546 (34.8%) about the euthanasia of their dog.

Measures

Emotion Dysregulation

Emotion dysregulation was measured using the short version of the Difficulties in Emotion Regulation Scale (DERS-SF; Kaufman et al., 2016). The DERS-SF consists of 18 items and contains six subscales including non-acceptance of emotional responses, difficulties engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. An example item is "When I'm upset, I have difficulty focusing on other things." Participants indicated their level of agreement with each statement using scales ranging from 1 (almost never) to 5 (almost always). It should be noted that higher scores indicate a greater difficulty regulating emotions. We included only the total score in analyses. Internal consistency as measured by Cronbach's alpha was high, α = .88.

Empathy for Animals

We adapted the Multi-Dimensional Emotional Empathy Scale (MDEES, Alloway et al, 2016; Caruso & Mayer, 1998) for use with regard to empathy for animals. We asked participants to respond to 17 statements (from the original 30 statements) concerning the extent to which they are affected by the suffering of animals. For example, "The suffering of animals deeply disturbs me." They responded on a 7-point scale from 1 (strongly disagree) to 7 (strongly agree). Internal consistency was high, $α = .82$.

Pet Attitude Scale

We used the Pet Attitude Scale (PAS, Templer et al., 1981) to assess participants' attitudes toward pets generally[1]. This scale contains 18 items, such as "I love pets" and "I like to feed animals out of my hand." Internal consistency was adequate, $α = .72$. Kennel workers scored higher on the PAS than social workers in the original study (Templer et al., 1981), verifying that it could distinguish between those expected to have differing levels of interest and investment in pets.

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[1] We did not use a measure of specific pet attachment or ask participants to respond with the most recently euthanized pet in mind specifically because some of the total respondents had multiple pets and some had not actually euthanized a pet and we wanted all respondents to respond to the same scale in the same way.

Scores on this measure are highly correlated with scores on measures of attachment to animals (e.g., Ellingsen et al., 2010).

Outcome Measures

Timing. Using the matrix format, we asked respondents to respond to the following: "It is always difficult knowing what is the right time for euthanasia when trying to balance suffering and time left to live". Indicate whether you would prefer making the decision a little too early and avoiding suffering or making the decision a little too late and extending the amount of time left. Indicate your preference for deciding to euthanize your pet early versus late in their illness from 1 (strong preference for early decision) to 6 (strong preference for late decision)."

Stage. Using a multiple choice format, we asked, "At what stage did you make the difficult decision to euthanize your pet?: 1= As soon as I knew the pet was ill but before they showed any signs of suffering, 2 = As soon as they began to show signs of suffering, 3 = After they had shown some signs of suffering but while they were still eating and engaging in some of their usual activities, 4 = After they had shown some signs of suffering and as soon as they stopped eating or engaging in their usual activities, 5 = Once they stopped eating and had been inactive for several days, 6 = Once they were no longer responsive, 7 = I would not euthanize - I would allow the pet to die a natural death."

Guilt. We asked, "How much guilt did you feel about the following aspect surrounding the euthanasia of your latest pet. If an aspect is not applicable you can select n/a." For, guilt for making the decision too early, they responded to "Making the decision to euthanize too early." For guilt for making the decision too late, they responded to "Making the decision to euthanize too late." They responded on a Likert scale of 1 (not very much guilt) to 5 (a tremendous amount of guilt).

Procedure

Participants were asked to complete the measures at a secure website, Qualtrics.com. The questionnaire was available in Dutch and English and distributed by snowball sampling through several social media accounts (Facebook, Twitter, LinkedIn) asking people who own(ed) a pet cat or pet dog to participate. Authors shared the link to the survey on their own social media accounts and asked followers to participate and/or share the invitation with their own networks. Invitations to participate were also posted to two cat rescue group pages on Facebook. In addition, 648 Dutch cat owners were invited over e-mail. These cat owners previously participated in other cat research (Bouma et al., 2021) and agreed to be invited for further research. The questionnaire was available between February 28 and April 1, 2022. The Dutch survey was reviewed and approved by the Institutional Review Board of the University of Groningen). The English survey was reviewed and approved by the Oakland University Institutional Review Board).

The introduction text in the survey mentioned that the topic of euthanasia might evoke negative feelings and that respondents could stop their participation any time if they felt uncomfortable. Furthermore, support websites were displayed at the end of the survey (depending on the country of residence specific websites for the United States, United Kingdom, The Netherlands and Belgium were shown). Respondents actively gave informed consent. The survey began with questions about the respondent (demographics including being a pet professional or not), the measures of empathy and emotion regulation described above, and questions about the

experience with euthanasia of their own pet cat(s) or dog(s)[2]. If owners had experience euthanizing more than one pet, they were asked to answer the questions regarding their most recent experience and to indicate what type of pet this involved (dog or cat). They indicated how long ago they had made this decision and for how long they had had the pet they had to euthanize. They were asked whether they made the decision alone or with others, and if so, with whom. They could choose "by myself, with family members, with my vet, with close friends or other" and they could indicate all that applied. They were also asked to indicate the primary reason(s) for their decision to euthanize. They selected all that applied from "behavioral concerns, health-related concerns, age of pet, health of owner, high cost of pet care, busy work schedule, living arrangements or other." Respondents also answered questions concerning how they determined when it was time to euthanize their pet and the guilt that they felt as a result of this decision.

Statistical Analyses

Group differences between dog (coded as 1) and cat owners (coded as 2) and the Dutch (coded as 1) and English sample (coded as 0) were examined with independent sample t-tests and Pearson chi-square tests. The outcome variables, timing, stage, early guilt, late guilt were regressed on pet type (cat, dog), emotion dysregulation, empathy for animals, and attitudes toward pets. We entered pet type, emotion dysregulation, empathy, and attitudes on the first step of the models. On the second step, we entered all two-way interactions, but no three-way interactions as we did not have hypotheses about three-way interactions. Preliminary analyses revealed few effects of sample (Dutch, English) so, for the sake of parsimony, we did not include this variable in the final analyses. We applied a Bonferroni correction for multiple analyses and therefore set alpha to .0125 for results from the regression analyses. We considered that our variables may exhibit quadratic associations with our outcomes, so we also initially conducted analyses including quadratic terms but very few quadratic effects were significant, so we present the simpler models omitting quadratic terms. We used IBM SPSS (version 28) software package to analyze our data.

Results

Sample Characteristics

The majority of the sample indicated that they made the decision to euthanize in consultation with their vet (59.9%) and/or family members (44.7%). A smaller proportion of the sample (23.4%) made the decision by themselves, and only 5% made the decision with close friends. No significant differences were present between cat and dog owners with regard to gender (comparing males to females only), age, ethnicity (Caucasian vs other) and child/marital status. Differences were present for education, animal professional and length of time with the pet: Cat owners were slightly more highly educated than dog owners ($\chi^2 = 12.78$, $p = 0.002$). The proportion of animal professionals was higher ($\chi^2 = 43.70$, $p < .001$) in dog owners compared to cat owners (39% vs. 23%). The time with the pet was longer for owners of cats compared to dogs ($\chi^2 = 22.85$, $p < .001$).

When comparing English to Dutch survey takers, Dutch owners were more likely to report on cats versus dogs, ($t_{649} = 9.13$, $p < .001$, 95% CI: -.31, -.21). English speaking participants were slightly older on average ($t_{687} = 2.67$, $p = .01$, 95% CI: .53, 3.44), and slightly less highly educated ($\chi^2 = 43.70$, $p < .001$), but more likely to work as animal care professionals ($\chi^2 = 45.94$, $p < .001$).

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[2] If respondents had never had to make the decision to euthanize their own pet cat or dog, they were asked to imagine a situation where they had to do this. In the current study, we report data of only those respondents who had actually made the decision to euthanize a pet.

They were more likely to be non-Caucasian ($\chi^2 = 13.57$, $p < .001$). They also differed significantly in the time since euthanasia ($\chi^2 = 17.72$, $p < .001$), with more recent experience in general, and a tendency to have spent a longer period of time with the pet before the euthanasia ($\chi^2 = 16.95$, $p < .001$). In addition, English speakers reported higher levels of spirituality ($t_{685} = 7.46$, $p < .001$, 95% CI: .36, .61), and were more likely to believe that they would see their deceased pet again in an afterlife ($t_{685} = 2.45$, $p < .001$, 95% CI: .02, .22). Table 1 shows that most of our respondents, across samples, euthanized their pets as a result of injury, age, or illness.

Table 1
Primary Reasons for Deciding to Euthanize by Pet Type

	Pet Type	
Reasons to euthanize	**Cat**	**Dog**
Behavioural problems	9	15
Health-related concerns of the pet	948	520
Age of the pet	292	212
Health-related concerns of humans	2	1
High costs of pet care	3	1
Busy work schedule	0	1
Moving/Living arrangements don't allow pets	0	0
Accident	10	3
Other reason	4	3
Total	996*	556*

Note. * Respondents could indicate more than one reason, so rows do not sum to the total number of participants.

Correlations Between Key Predictors and Outcomes

The bivariate zero-order correlations and descriptive statistics for all predictors and outcomes appear in Table 2. Emotion regulation was not related to the other predictors, but it was negatively related to the outcomes of timing and guilt. Empathy and attitudes toward animals were highly correlated and predicted stage and guilt (although attitudes did not predict guilt at making the decision too late). Interestingly, timing and stage were negatively associated, and, whereas timing was positively associated with both types of guilt, stage was not. Dog owners had higher levels of empathy for animals and more positive pet attitudes in general compared to cat owners.

Regressions

The results of the step-wise linear regressions for each of the four outcomes appear in Table 3.

Timing

There were no significant effects of Timing with our adjusted alpha level.

Stage

There were significant main effects of pet type ($\beta = .072$, $t = 2.79$, $p = .005$, 95% CI: .045, .257) and empathy ($\beta = .083$, $t = 2.563$, $p = .010$, 95% CI: .020, .154). Respondents were more

likely to make later decisions for cats than for dogs. Respondents with higher levels of empathy for animals were also more likely to make later decisions.

Table 2
Zero-order Correlations and Descriptive Statistics for the Key Predictors and Outcomes

	1	2	3	4	5	6	7	8
1. Pet Type	—							
2. Emotion Dysregulation	.009	—						
3. Empathy for Animals	-.052*	-.001	—					
4. Pet Attitudes	-.108***	.041	.61***	—				
5. Timing	-.052*	.061*	-.002	-.007	—			
6. Stage	.063**	.020	.095***	.073**	-.23***	—		
7. Guilt Early	-.028	.109**	.179***	.124***	.254***	.062	—	
8. Guilt Late	.071*	.107***	.086**	.026	.327***	.013	.367***	—
Mean	1.646	1.962	6.164	6.215	2.850	3.330	2.270	3.010
Standard Deviation	0.478	0.538	0.587	0.426	1.140	1.012	1.454	1.480

Note. *$p < .05$; **$p < .01$; ***$p < .001$.

Guilt for Too Early Decisions

There were significant main effects of emotion dysregulation (β= .106, t = 3.190, p = .001, 95% CI: .041, .172) and empathy (β = .159, t = 3.780, p < .001, 95% CI: .082, .258). Respondents with greater difficulty regulating emotion and those with higher levels of empathy for animals experienced more guilt for having made decisions too early.

Guilt for Too Late Decisions

There were significant main effects of emotion dysregulation (β = .104, t = 3.207, p = .001, 95% CI: .040, .165) and empathy (β = .102, t = 2.503, p = .012, 95% CI: .023, .194). Respondents with greater difficulty regulating emotion and those with higher levels of empathy for animals experienced more guilt for having made decisions too late. No significant interaction effects were present for any outcome with our adjusted alpha level.

Table 3
Hierarchical Linear Regression Results

	Timing			Stage			Guilt Too Early			Guilt Too Late		
	R^2	ΔR^2	β	R^2	ΔR^2	β	R^2	ΔR^2	β	R^2	ΔR^2	β
Step 1	.007**	.004**		.015***	.012***		.044***	.039***		.024**	.020***	
Pet Type			.053*			.072**			-.019			.070*
Emotion Dysregulation			.061*			.018			.106**			.104**
Empathy for Animals			-.004			.083**			.159**			.102**
Pet Attitudes			-.001			.026			.024			-.035
Step 2	.11	.004		.021***	.014***		.055***	.044***		.027**	.017**	
Pet X Dysregulation			.032			.186*			-.183			-.019
Pet X Empathy			-.019			-.139			-.158			-.157
Pet X Attitudes			.231*			.248*			.165			.170
Dysregulation X Empathy			.000			-.027			.046			-.019
Dysregulation X Attitudes			-.018			.024			-.053			-.002
Empathy X Attitudes			.005			-.019			.066			.031

Note. $^*p < .05$; $^{**}p < .01$; $^{***}p < .001$.

Discussion

We surveyed 1542 dog and cat owners residing in North America and Europe with the goal of better understanding factors underlying decisions regarding the timing of euthanasia in these pets. Because of our interest in how owners balanced concern for suffering and their own desire to prolong time with their pets, we focused on euthanasia in the context of illness, injury or old age. We focused our analyses on pet owners that had previously been involved in at least one decision to euthanize a pet. Overall, there were no statistically significant effects of pet type, other than cat owners reporting making the decision at a later stage in disease compared to dog owners. Researchers have also found that, for pet dogs, but not cats, making the decision to euthanize compared to having a pet die without having euthanized was negatively correlated with extended grief (Planchon et al., 2002). This might be related to dogs and cats behaving differently in response to pain (Hernandez-Avalos et al. 2019). Whereas dogs will show pain or discomfort more openly (e.g., whining and pacing), cats are more likely to stay silent and out of sight, which might explain later recognition of their suffering by owners. Although it is possible that different decisions for cats compared to dogs reflected differences in the characteristics of cat versus dog owners, rather than attributes of the pets themselves, cat and dog owners did not significantly differ in age, gender, level of education, religious or spiritual beliefs, including their belief in the likelihood of being reunited with their pet in the afterlife, although the latter difference approached significance ($t_{331} = 1.74$, $p = .08$, 95% CI: -.01, .18): Dog owners were slightly more likely to think that they would see their deceased pet again in an afterlife. Correlations between pet type and our predictors indicated that dog owners had somewhat higher levels of empathy for animals and more positive pet attitudes in general compared to cat owners. These differences may have led the dog owners to make earlier decisions to euthanize, although pet type did not significantly interact with empathy or attitudes to predict timing outcomes. A measure of attachment that captured specific attachment to the euthanized pet rather than general attitudes toward pets might be more likely to predict later decisions and we will include such a measure in future work.

We included the general measure of attitudes toward pets (Templer et al., 1981) so that the questions were relevant for owners with multiple pets and those that had not euthanized a pet. Earlier research shows measures of attitudes toward pets to be highly correlated with measures of attachment (e.g., Brown et al., 1996; Ellingsen et al., 2010; Hawkins et al., 2017) and empathy (Daly & Morton, 2006), and we also found a high correlation with empathy here. Bivariate correlations also indicated that attitude toward pets was associated with guilt related to making decisions too early and decisions being made at later stages of an illness or injury. Tzivian et al. (2014) found that Israeli pet owners often delayed the decision to euthanize because of their strong connections to their pets, as indicated in qualitative interviews about their euthanasia experiences. Despite these correlations, attitudes toward pets were not a significant predictor in our regression models. Perhaps this was due to shared variance with our other predictors; however, the predictors were not highly correlated and VIF factors indicated that there was no reason to be concerned about multicollinearity.

We had hypothesized that empathy for animals might predict either early decisions to reduce pet suffering or later decisions to extend the pet's life. However, we thought that the association between empathy and timing of decisions would be moderated by participants' ability to regulate their emotions such that those high in empathy but low in emotion regulation might be likely to make earlier decisions to euthanize to prevent dealing with the discomfort of seeing a beloved pet sick or in pain (Batson, 1998). Park and Jeong (2022) recently found that maladaptive emotion regulation strategies increased the effect of attachment on separation pain after pet loss.

Contrary to our hypotheses, empathy and emotion regulation did not interact to predict the timing of euthanasia decisions. However, both factors independently predicted the amount of guilt that respondents felt; both for having made decisions too early as well as having made decisions too late. This might indicate that owners high in empathy and those low in emotion regulation feel greater guilt for making the decision to euthanize at all, regardless of the timing of the decision, compared to those lower in empathy and those with better emotion regulation.

Respondents high in empathy were more likely to make decisions further in the process when the pet's disease had begun to impact its activities. This was in contrast to our prediction that those high in empathy might be likely to make earlier decisions to reduce pet suffering. Our hypothesis was based on the expectation that owners high in empathy would have difficulties seeing their pets suffering – a primary reason cited by Israeli pet owners for euthanizing their pets (Tzivian et al., 2014). Previous research found that empathy predicted opposition to euthanasia in human children (Deak & Saroglou, 2017) and adults (Portenoy et al., 1997). Whereas opposition is not equivalent to delaying eventual euthanasia, it is possible that empathy is more strongly related to moral beliefs regarding the sanctity of life and not the reduction of suffering, which is what we had anticipated.

Interestingly though, this outcome variable (stage) was negatively correlated with respondent's self-reported preferences for making decisions early or later in the illness (timing). That is, respondents' self-reported preferences for making later decisions actually predicted having made decisions earlier in the progression of a pet's disease or condition. Given that respondents reported guilt for both too early and too late decisions, it is possible that the preference reported now in retrospect was adjusted based on the guilt felt for having made earlier decisions. Other studies have found only a small proportion of bereaved pet owners to display significant guilt following euthanasia, but these researchers did not focus on the specific timing of the decision to euthanize (Bussolari et al., 2017; McCutcheon & Fleming, 2001; Planchon et al., 2002; Tzivian et al., 2014). Previous research has shown that anticipatory grief can result in delaying euthanasia (Brockman et al., 2008; Fernandez-Mehler et al., 2013; Hewson, 2014), so we expected that greater attachment, which predicts greater grief, would lead to later decisions. However, the timing preference in our study was not significantly predicted by pet type, empathy or attitudes toward pets, or emotion regulation.

Limitations and Directions for Future Research

We omitted several potentially interesting variables in the current study in the interest of keeping the survey brief. It should be noted that our statistical models accounted for a very small portion of the variability in the timing of euthanasia decisions. Thus, we acknowledge there are many other important factors in EoL decisions that were not accounted for in our models but that should be considered. Although our sample was relatively large, future research would benefit from a more diverse sample. Our sample was predominantly white and, as is common in human-animal interaction research, our sample is not entirely representative for the general population as women and people with a relatively high educational level are over-represented. Women in particular are likely to have stronger attachments to pets compared to men (Brown et al., 1996; Ellingsen et al., 2010) whereas the results concerning the relationship between education and pet attachment is more mixed (Ellingsen et al., 2010; Martens et al., 2016; Signal & Taylor, 2006; Wong et al., 2019). It is also highly likely that our sample was strongly biased toward individuals that heavily invested in their pets. Thus, we did not likely capture the attitudes or predictors of participants with less close relationships to their pets, but this is probably true of most relevant studies on human/pet relationships (see also Littlewood et al., 2021).

Sampling individuals with a diversity of religious beliefs would also be important given how ideas about an afterlife and whether animals have minds and souls likely influence EoL decisions as well (Sanders, 1995; Testoni et al., 2017). However, previous research indicated that religious beliefs did not predict distress following euthanasia or the determination of euthanasia as appropriate (Davis et al., 2003). We expected some differences between our North American and European samples given differing practices, such as the tendency for more Americans to restrict their pets to indoor only environments (Foreman-Worsley et al., 2021), and differences in attitudes about euthanasia generally (Deak & Saroglou, 2017; van Tol et al., 2012) might suggest differences in EoL practices as well. However, we did not find significant differences between our English speaking and Dutch speaking cohorts. Future research could further examine pet owners and euthanasia in various cultures.

In addition, although we asked some questions about the particular reasons for which the owner had to consider euthanasia, we did not analyze these factors here. The vast majority of our participants euthanized due to poor health or old age, so we did not have much variability in these factors. The underlying cause for the pet's suffering or the extent of their suffering may be more predictive than any of the factors we considered. Because these aspects were considered to some degree in our timing and stage outcome measures and not as predictors, we may have reduced some of the variability in responses. Furthermore, our survey was focused on pet owners who chose euthanasia because their pet was ill or suffering in some way. However, we did not explicitly ask questions about euthanasia following accidental injuries. We did not focus on decisions surrounding economic issues, behavioral issues, or decisions made solely for the convenience of the owner. This focus may have influenced the findings. We also did not account for the owners' desire for control concerning the timing of the death of their pets (Davis et al., 2003), which future work should account for. Future work should also consider the owners' anticipatory grief and the extent to which this delays the euthanasia decision, as previous studies have found this to be an important factor (Lagoni, 2011; Littlewood et al., 2020, 2021a; Shaw & Lagoni, 2007). In addition, future work should also examine the role of behavioral concerns, age of pet, length of time with pet, and the extent to which other individuals (such as other pet caretakers and veterinarians) in the decision-making process.

Conclusions

Our study aimed to shed light on the process of making decisions surrounding euthanasia of a companion animal. We decided to focus on owner attributes such as empathy and emotion regulation and general attitudes toward pets, but we recognize that many other owner and pet attributes are important to making such difficult decisions. Contrary to our hypotheses, we found no evidence for an interaction between empathy and emotion regulation on the timing of euthanasia. However, both empathy and emotion regulation predicted guilt following euthanasia. Higher levels of empathy predicted later euthanasia decisions, in contrast to our predictions. Our results suggest that empathy may be related to the value of life, rather than reduction in suffering. Future work is needed to identify other factors underlying pet owners' decision-making processes regarding EoL care for their pets, and how these factors are weighed. This is an incredibly complex issue that is likely influenced by a myriad of factors not captured in the current survey. Although this is a difficult subject, it is an important one that deserves further research attention. It is our hope that a better understanding of how owner characteristics impact their decision-making will allow veterinary professionals to communicate options to an owner that address their concerns and reduce overwhelming feelings of guilt while allowing them to make the best decisions for their

pets. Our results are one step in better understanding pet owner characteristics and their influence on EoL decisions.

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