

Predictors of post-traumatic growth and stress following the loss of a pet

by

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Table of Contents

Main Introduction	3
Health Benefits of Pet Ownership	4
Consequences of pet loss on mental health- distress, stigma and growth	6
Social support as a moderating factor between pet loss and mental health	9
Coping strategies as a moderating factor between pet loss and mental health..	9
Study 1	11
Method	13
Results and Discussion	18
Study 2	30
Method	31
Results and Discussion	36
General Discussion	49
Limitations	55
Conclusion	57
References	58
Appendices	65

Introduction

Humans often share an emotional connection with their companion animals that is evident at both a psychological and physiological level (Walsh, 2009). It has been suggested that the emotional connections in human-pet relationships can be understood within the same framework of attachment as human-human relationships (Zilcha-Mano et al., 2012). The presence of companion animals may alter the psychological impacts of stressor exposure by increasing feelings of social support, improving self-esteem and lowering psychophysiological responses to stress (Allen, Blascovich & Mendes, 2002; Siegel, 1990). There is an abundance of evidence to suggest that the level of attachment to the pet is an important aspect for the health benefits of pet ownership to be realized (Allen, Blascovich & Mendes, 2002; Peacock et al., 2012; Walsh, 2009; Wood, et al., 2005; Zilcha-Mano et al., 2012). The comfort, affection and security that the human-pet relationship provides in times of stress, depression and vulnerability (Walsh, 2009) makes the attachment just as important as a human-human bond (Zilcha-Mano et al., 2012).

At the same time as recognizing the importance of pets, there is little social recognition of the grieving process following the loss of a companion animal (Chur-Hansen, Stern and Winefield, 2010), despite the fact that symptoms of bereavement can be severe (Wrobel & Dye, 2003). Of the research that does exist, the concern is on the distress associated with pet loss. But there is also reason to believe that not only do some individuals cope better with such loss, some grow from the experience. For example, following loss, many will turn to, or acquire another pet, or will get involved with animal organizations (Tesfom & Birch, 2013). Most of the current pet loss research focuses on the grief experienced when an animal companion passes, and fewer studies have focused on posttraumatic growth that can be experienced following the loss. The

present study investigated attachment, grief and other moderating factors that may influence the outcome of post-traumatic stress or post-traumatic growth following the loss of a companion animal.

Health benefits of pet ownership and the role of attachment

Many studies have suggested that pet ownership provides numerous health benefits. From a physical health standpoint, pet ownership has been found to be a protective factor to the negative physiological effects associated with stress and anxiety (Allen, et al., 1991; Anderson et al., 1992; Herrald et al., 2002). For example, when people performed a laboratory stressor task near their pet, there was lower reactivity in heart rate, blood pressure and skin conductivity (Allen et al., 1991). When the same task was performed in the presence of a friend, stress reactivity increased, suggesting that the pet was the preferred companion to remain calm when performing a stressful task. Pets appear to decrease anxiety through reducing sympathetic nervous system arousal in times of stress (Allen et al., 1991; Friedmann, 2013). A relationship between pet ownership and attenuation of the negative health impacts of chronic stressors has also been identified. For example, patients who experienced a myocardial infarction brought on by chronic stress demonstrated more success in their rehabilitation program if they owned a dog, relative to patients who did not own a dog (Herrald et al., 2002). The difference in patient success was attributed to dog owners being generally more active than non-dog owners. As a result, dog owners were more likely to experience the health benefits of exercise on stress and the cardiovascular system (Herrald et al., 2002).

From a psychosocial standpoint, it appears that pets also serve as a social catalyst (Robbins et al., 1991), in that they allow for companionship and trust formation among pet owners. Pet ownership has been found to be associated with trust among newly acquainted

individuals (Robbins et al., 1991). Walking a pet within the community increased interactions with neighbours, and pet owners were more interested in local issues and more likely to engage in community activities in comparison to non-pet owners (Wood, et al., 2005). In addition to being a social catalyst, other determinants of mental health affected by animal companionship include enhanced feelings of happiness and security, and reduced feelings of loneliness and isolation daily (Sable, 1995).

Though there is an abundance of evidence suggesting that pet ownership has positive health benefits, there is conflicting evidence as to whether stronger attachment positively or negatively influences these health benefits. For example, some studies suggest that attachment positively mediates the health benefits that transpire from the relationship between people and their companion animals (Zilcha-Mano et al., 2012). However, other studies suggest that high pet attachment was associated with greater psychological vulnerability, and therefore, stronger attachment might have a negative influence on the psychological health of the individual (Peacock, Chur-Hansen, Winefield, 2012). Alternatively, those who are most vulnerable as a result of social inequities (i.e. Indigenous populations, culturally diverse communities, children and youth, elderly, people with disabilities, homeless and people who suffer from mental illness) may be more likely to become attached to their pet (Thompson et al., 2014). In addition, the relationship between pet attachment and psychological outcomes may depend on other human social supports. It has been suggested that companion animals act as a buffer against depressive symptoms associated with loneliness for those with inadequate human social support (Garrity et al., 1989). In contrast, it was found that among people who lived alone, those who had strong human social networks were more likely to experience the positive health benefits of pet ownership, whereas those with fewer human social supports who were highly attached to their

pets expressed greater loneliness and depressive symptoms (Antonacopoulos & Pychl, 2010).

Similarly, Wells and Rodi (2000) concluded that elderly dog and cat owners who benefitted the most from pet ownership already had well-supported social relationships and did not solely rely on their pet for support. Thus, the presence of both human and animal social support appears to be the most optimal recipe to minimize feelings of loneliness.

Consequences of pet loss on mental health- distress, stigma and growth

Many of the studies assessing the psychological impacts of pet ownership highlight the importance of the bond that arises between humans and their companion animals. However, animal companions have a much shorter life span than humans, which makes it important to understand the implications of pet loss among individuals who are highly attached to their pets (Wrobel & Dye, 2003).

The distress of losing an animal companion can be similar to that of losing of human companion (Podrazik et al., 2000). Indeed, pet attachment has been found to be predictive of the severity of grief symptoms experienced by owners 6 to 12 months following the loss (Wrobel & Dye, 2003). Although the notion of stages of grief is no longer viewed as credible or useful in bereavement practices (Corr, 2015), models of grief that were proposed following pet loss (Quackenbush, 1985; Rosenberg, 1984) were highly similar to the stages of grief described by Kubler-Ross (1969), suggesting an understanding that grief associated with pet loss is similar to that experienced with the loss of a loved human. The only unique feature of grieving the loss of a pet companion is the common experience of guilt, which is particularly pronounced if the pet was euthanized. Often financial matters come into play if the pet was sick, old, or both, and euthanasia is a common solution that causes the owner to feel responsible for the death of their pet (Podrazik et al., 2000). Guilt might also be significant if the loss of the pet was a result of a

traumatic event. For example, Following the devastation of Hurricane Katrina, being forced to abandon pets during evacuation was a significant stressor that, in itself, was strongly associated with both acute stress and follow up symptoms of PTSD and depression (Hunt et al., 2008).

Pet loss has been described as disenfranchised grief (Packman et al., 2014), which is grief that is not acknowledged (Doka, 2008) or is viewed as inappropriate (Meyers, 2002). There is a stigma surrounding grief associated with pet loss, and bereaved pet owners are often expected to end their grief more quickly than those grieving the loss of a human (Cordaro, 2012). Such social expectations may cause bereaved pet owners to feel shame (Meyers, 2002), and social isolation emanating from a lack of social support (Spain, O'Dwyer & Moston, 2019). Meyers (2002) concluded that disenfranchised grief makes it very difficult for individuals to properly mourn and find meaning in the loss. Thus, although the reaction to pet loss can be similar to human loss, the grieving process is different because the stigma of pet bereavement associated with disenfranchised grief can make it more difficult to mourn pet loss (Cordaro, 2012).

This said, following loss, the struggle to find meaning in the wake of the trauma can promote psychological growth (Janoff-Bulman & Frantz, 1997; Tedeschi & Calhoun, 1996). The ability to achieve personal growth following loss can be conceptualized by two distinct dimensions of finding meaning (Janoff-Bulman & Frantz, 1997). The first dimension is whether the experience is comprehensible, that is, making sense of the loss and determining that the event fits the existing beliefs of the individual (e.g. if the pet was sick or old then the loss was expected and makes sense). The second dimension of meaning finding is significance, that is, finding benefit in the experience and determining the value of the event in one's life. Meaning making following loss can contribute to positive psychological change (growth) and minimize the harmful implications of negative events (Janoff-Bluman & Yopyk, 2004). Considering the

important role a pet can play, the absence of meaning finding may result in greater negative psychological effects that accompany bereavement (grief). An important differentiation worth noting is that meaning making does not necessarily diminish feelings of bereavement, but it can mitigate the effects (Boyraz & Bricker, 2011).

In a cross-cultural study, post-traumatic growth was investigated among individuals who had lost companion animals (Bussolari et al., 2019). The findings suggested that many of the U.S. respondents reported that it was “too soon” to think about growth or positive change from the loss, whereas respondents from Canada, Japan and Hong Kong reported that it was important to find meaning in the loss. This study had varied results due to variations in the timeline of data collection. In the U.S. respondents were asked shortly after the pet passing whereas other respondents were asked months/years after passing. This suggests that the timeline must be considered when assessing an individual’s ability to achieve growth or positive change following pet loss. In this regard, growth was possible among those who had more time to grieve (Bussolari et al., 2019). Similarly, when grieving human loss, early on in bereavement negative affect persists, but over time attention can turn to sources of minimized grief symptoms or even positive affect (Clark, 2004). However, there is little research with human or pet bereavement that has suggested a general timeline necessary to achieve PTG.

Other research examining post-traumatic growth following pet loss determined that disenfranchised grief was negatively related to post-traumatic growth, especially when grief severity was high (Spain, O’Dwyer & Moston, 2019), and conversely, individuals with lower levels of disenfranchised grief, even when grief severity was high, experienced the most growth (Morris et al., 2005). However, when grief severity was low, disenfranchised grief had a positive relationship with post-traumatic growth (Spain, O’Dwyer & Moston, 2019). This implied that

disenfranchised grief potentially decreases the opportunity for PTG, particularly when there is greater grief severity following the loss. Both studies suggested that grief severity played a moderating role in post-traumatic growth following pet loss and those who reported higher disenfranchised grief also reported low levels of perceived social support. However, neither study accounted for pet attachment, which likely contributes to experiencing greater grief (Field et al., 2009).

Social support as a moderating factor between pet loss and mental health

The prevalence of disenfranchised grief may be reflected in perceptions of social support following the loss of a pet. Social support can serve as a protective factor against the negative consequences of stressors and may influence post-traumatic growth for individuals experiencing pet loss. For example, “relating to others” was a common theme expressed among bereaved pet owners who experienced post-traumatic growth (Packman, Bussolari, Katz, Carmack & Field, 2017). Many bereaved owners reported that sharing their experience with family members strengthened their relationships with these family members (Packman, et al., 2017). Similarly, bereaved pet owners who reported higher levels of social support were more likely to experience growth following pet loss, whereas individuals who were more isolated were less likely to achieve growth (Spain et al., 2019). Thus, it appears that the emotional distress of losing a pet may be exacerbated in the absence of other supports, and post-traumatic growth may be more likely to occur in the presence of high levels of support from family, friends or counsellors (Lowe et al., 2009; Wong et al., 2017).

Coping strategies as a moderating factor between pet loss and mental health

In addition to social support being associated with the emotional distress of loss, coping processes that are generated in times of stress are associated with changes of emotions (Folkman & Lazarus, 1988). Different types of coping are associated with different changes of emotion, with some coping strategies (e.g. planned problem solving) being linked to positive emotional outcomes whereas other coping strategies (e.g. confronting or distancing from others) tend to be associated with negative emotional outcomes (Folkman & Lazarus, 1988). The effectiveness of particular coping strategies may be dependent on the type of stressor and the ability of the individual to apply one or multiple appropriate coping strategies concurrently or sequentially (Anisman, 2014).

Typically coping strategies reflect either a problem-focused or an emotional-focused orientation. Problem-focused coping consists of gathering information, planning and taking action to alter the context or situation (Carver, Scheier, & Weintraub, 1989). Coping strategies that are focused on managing emotional reactions to the situation are emotional coping strategies, which include actively processing emotions, expressing or containing the emotions, ruminating, and reflecting (Carver et al., 1989). Avoidant coping strategies deny and avoid dealing with the stressor entirely, which can include avoiding situations that serve as a reminder of the stressor (Carver et al., 1989). Depressive symptoms are often associated with higher emotion-focused and lower problem-focused coping (Matheson & Anisman, 2003), leading some to suggest that some types of emotional-focused coping (ruminating and emotional expression) and avoidant coping (denial) are more damaging than beneficial (Bigatti, Wagner, Lyndon-Lam, Steiner, & Miller, 2010). This said, in situations that are uncontrollable, coping strategies that enable individuals to manage their emotions might be most effective enabling them to find meaning and grow from the experience (Folkman & Lazarus, 1988).

The present study

The present study aimed to identify the outcome of pet loss on well-being, and the influence of pet ownership when stressors are encountered. Two studies were conducted, Study 1 assessed the outcome of pet loss on well-being and Study 2 examined the difference in response to stressors among pet owners, non-pet owners and those who have experienced pet loss.

Study 1

The objective of Study 1 was to assess the relationship between pet attachment and grief following pet loss with posttraumatic growth (PTG), and the conditions under which individuals who have recently lost a pet experienced post-traumatic growth or post-traumatic stress (PTS). In particular, the role of perceived social supports and coping strategies were expected to moderate their response to loss. It was hypothesized that:

(1) Attachment (to the deceased pet) and grief would interact to influence PTG and PTS.

Specifically, at higher levels of grief, greater attachment would be unrelated to PTG, but would be associated with more severe PTS. When less grief is experienced, attachment would be associated with greater PTG, and the relationship to PTS attenuated.

(2) The relationship between pet attachment and grief severity with PTG and PTS

following loss would be moderated by perceptions of social support. Specifically, among those perceiving higher levels of social support, the relationships between attachment and grief severity with growth would be positive while the relationships between attachment and grief severity with post-traumatic distress would be minimal (not significant). The inverse would be true at lower levels of perceived social

support, in that greater attachment and grief would be related to lower levels of post-traumatic growth and higher symptoms of post-traumatic distress.

- (3) The relationship between pet attachment and grief with PTG and PTS following pet loss would be moderated by problem-focused coping. Specifically among those expressing higher levels of problem-focused coping strategies, the relationship between attachment and grief with PTG would be positive while the relationship between attachment and grief with PTS would be negative; these relationships would be attenuated among those not endorsing problem-solving coping.
- (4) The relationship between pet attachment and grief with PTG and PTS following pet loss will be moderated by emotional-focused expressive coping. Specifically among those expressing higher levels of emotional-focused coping strategies, the relationship between attachment and grief with PTG would be negative while the relationship between attachment and grief with PTS would be positive; these relationships would be attenuated among those not endorsing emotional-focused coping.
- (5) The relationship between pet attachment and grief with PTG and PTS following pet loss will be moderated by avoidant coping strategies. Specifically, among those expressing higher levels of avoidant coping strategies, the relationship between attachment and grief with PTG would be negative while the relationship between attachment and grief with PTS would be positive; these relationships would be attenuated among those not endorsing avoidant coping.
- (6) Pets will act as a social buffer for individuals with low perceived social support. Specifically, if another pet is present at the time of pet loss, the relationship between attachment and grief with PTG will be positive, while the relationship with

attachment and grief with PTS will be negative. The inverse will be true if another pet is not present at the time of the loss.

Method

Procedure

Participants were recruited via Amazon Mechanical Turk (mturk) to complete a 25-35 minute survey on how pet loss influences well-being. To be eligible for the study, participants had to be 18 years of age, be fluent in English, and must have lost a pet within the past year.

Participants completed the questionnaire using the Qualtrics survey platform. An informed consent document was presented at the start of the survey, and after agreeing to proceed, participants were administered a series of questionnaires. The questionnaires included background information, pet attachment, pet bereavement, perceptions of social support, coping strategies, post-traumatic growth, and posttraumatic distress. Other measures included a brief health questionnaire, quality of life, depressive symptoms, unsupportive social interactions inventory, loneliness, and open-ended questions (to allow bereaved pet owners to express their feelings towards their deceased pet). Given the disenfranchised grief associated with pet loss, the open-ended questions were intended to provide an outlet for participants to express their grief in a judgement free context, and mitigate any adverse effects that may have risen when prompted by the survey to recall the events of the pet loss. The open-ended responses were also used for quality to control to determine who answered the survey honestly. Those who did not answer or provided an answer that did not make sense (e.g. a number) were removed from the working data file and were not included in the analysis. It is more likely that owners who were most attached or impacted by the loss would want to write about their pet, therefore, this method of quality

control allowed for the analysis of participants who were impacted by the loss. Due to the quantitative and exploratory nature of this study, there were no specific hypotheses regarding the open-ended questions, therefore analyses involving them were not reported.

At the end of the survey participants were presented with a debriefing form that included contact information and further resources if participants had questions or felt distressed after describing the loss of their pet. Upon completion of the survey, participants were compensated \$5 CAD. This study was approved by the Carleton University Research Ethics Board – B (# 110592).

Participants

The sample comprised 309 participants who had lost a pet within the past year, with the majority of participants being male (see Table 1). In addition, 44.7% of participants were married/ cohabiting with the next highest majority at 31.1% being single and not seeing anyone. The majority of participants had average to low incomes, with most being employed full time. Most had lost a dog or cat within the past year, relative to other pet species. The vast majority claimed that their pet was not a certified working animal. Just over half of the participants reported that the loss was unexpected. Most reported not having another pet at the time of the loss.

Variable	Mean (SD) or Count (%)
Age	33.9 years ($SD = 10.26$)
Gender	
Female	105 (34.0%)
Male	202 (65.4%)
Prefer not to say	1 (0.3%)
Relationship Status	
Single and not seeing anyone	96 (31.1%)
In a casual relationship	22 (7.1%)

In a serious relationship	41 (13.3%)
Married/ Cohabiting	138 (44.7%)
Separated/ Divorced	11 (3.6%)
Widowed	1 (0.3%)
Gross Income Per Year	
Under \$15,000	26 (8.4%)
\$15,000-\$29,999	66 (21.4%)
\$30,000-\$44,999	69 (22.3%)
\$45,000- \$59,999	52 (16.8%)
\$60,000- \$74,999	39 (12.6%)
\$75,000- \$89,999	22 (7.1%)
\$90,000- \$104,999	11 (3.6%)
\$105,000 or more	23 (7.4%)
Prefer not to say	1 (0.3%)
Employment Status	
Employed Part-Time	51 (16.5%)
Employed Full-Time	238 (77%)
Unemployed	8 (2.6%)
Retired	6 (1.9%)
Other	5 (1.6%)
Type of Pet Lost	
Dog	192 (62.1%)
Cat	108 (35.0%)
Other	9 (2.9%)
Certified Working Animal	
Service Animal	20 (6.5%)
Therapy Animal	12 (3.9%)
Emotional Support Pet	64 (20.7%)
Not a certified working animal	213 (68.9%)
Another Pet at the time of loss	
Yes	111 (35.9%)
No	198 (64.1%)
Was the Loss Expected	
Yes	61 (19.7%)
No	161 (52.1%)
In Some Ways	87 (28.2%)

Table 1- Study 1 Participant Frequencies

Measures

Background information. Participants indicated their gender, age, relationship status and employment status. They also indicated the type of pet they had lost in the past year, whether or not the pet was a certified working animal, if they had another pet at the time of the loss and if the loss was expected.

Pet attachment. Strength of pet attachment was measured using the Pet Attachment Survey (Holcomb, Williams, & Richards, 1985). Respondents used a 4-point Likert scale ranging from 1 ‘Strongly Disagree’ to 4 ‘Strongly Agree’ to rate their agreement with 27 statements measuring their closeness and emotional connection to their deceased pet (if they lost more than one pet they responded to questions keeping in mind the pet they felt closest to). Total scores were calculated by averaging (reverse scoring where necessary) all items, such that higher scores indicated stronger attachment ($\alpha = .91$).

Pet bereavement. Severity of grief due to the loss of the pet was measured using the Pet Bereavement Questionnaire (Hunt & Padilla, 2006). Respondents used a 4-point Likert scale ranging from 1 ‘Strongly Disagree’ to 4 ‘Strongly Agree’ to rate their agreement with 15 statements measuring their grief following the loss of their deceased pet (if they lost more than one pet they responded to questions keeping in mind the pet they felt closest to). Total scores were calculated by averaging all items, such that higher scores indicated more severe grief ($\alpha = .85$).

Post-traumatic growth. Strength of post-traumatic growth was measured using the Post-Traumatic Growth Inventory (Tedeschi & Calhoun, 1996). They rated each item on a scale ranging from 1 ‘I did not experience this change’ to 6 ‘I experienced this change to a very great degree’ to rate 21 items assessing the degree of positive change they experienced (e.g. I have a greater appreciation for the value of my own life) following the loss of their pet (if they lost more

than one pet they responded to questions keeping in mind the pet they felt closest to). Total scores were obtained by averaging the responses, such that higher scores reflected greater positive growth following the pet loss ($\alpha = .97$).

Social support perceptions. Perceived social support was measured using a short form of the Social Provisions Scale (Russell & Cutrona, 1984). Respondents used a 4-point Likert scale ranging from 1 ‘Strongly Disagree’ to 4 ‘Strongly Agree’ to rate their agreement with 12 statements measuring their perceived level of social support. Total scores were calculated by averaging (reverse scoring where necessary) all items, such that higher scores indicated greater perceived social support ($\alpha = .88$).

Coping strategies. Coping strategies were measured using a short form of the Survey of Coping Endorsements (SCOPE, Matheson & Anisman, 2003). Respondents used a 4-point Likert scale ranging from 1 ‘Strongly Disagree’ to 4 ‘Strongly Agree’ to rate their agreement with 27 statements measuring how each individual copes with stressors. This measure taps into three subscales; Problem Solving ($\alpha = .79$), Emotional Expression ($\alpha = .85$) and Avoidance ($\alpha = .71$). Total scores were calculated for each subscale by averaging all items for that subscale, such that higher scores indicated greater endorsement of that strategy for coping.

Impact of Events. Post-traumatic stress following the pet loss was measured using the Impact of Events Scale (Zilberg, Weiss & Horowitz, 1982). Respondents used a 4-point Likert scale ranging from 1 ‘Strongly Disagree’ to 4 ‘Strongly Agree’ to rate their agreement with 22 statements measuring how much the death of their pet impacted them (e.g., I felt irritable and angry). Total scores were calculated by averaging (reverse scoring where necessary) all items, such that higher scores indicated stronger post-traumatic stress symptoms ($\alpha = .92$).

Statistical Analyses

Analysis were performed using IBM SPSS Statistics 26 (SPSS Science, Chicago, IL, USA). Correlations and oneway analyses of variance (ANOVAs) were used, as appropriate, to assess variations in predictor (pet attachment, grief) and outcome variables (posttraumatic growth and stress) as a function of background factors (age, gender, relationship status, gross income, employment status, type of pet lost, if the pet was a certified working animal, did they have another pet at the time of the loss, was the loss expected). Where these factors met the criteria as covariates (i.e., related to the outcome, but not predictor variables, and do not interact with the predictor variables to influence outcomes), they were included in the main analyses as such. Variables that met the assumptions to serve as covariates included whether the loss was expected or not in relation to PTG, and the type of pet lost, namely cat vs. dog in relation to PTS. The PROCESS macro for SPSS (Model 1, Hayes & Preacher, 2013) was used to conduct regression analyses between pet attachment and the outcome variables (PTG and PTS), along with assessing the moderating roles of social support perceptions and coping strategies, each in separate analyses. All continuous variables were centered to calculate cross-products; if the interaction was significant, simple slopes analyses were conducted at 1 *SD* above and below the mean of the moderating variables. Significance was determined at $p < .05$ for all analyses.

Results and Discussion

Oneway ANOVAs were conducted to assess whether differences in attachment to the deceased pet, grief, posttraumatic symptoms (PTS) and posttraumatic growth (PTG) were evident in relation to demographic variables and characteristics of the pet context. None of the demographic variables (gender, relationship status, income and employment status) accounted for variation in the attachment or responses to the loss of a pet. However, as seen in Table 2, type

of pet lost (dog vs. cat; other was eliminated due to small sample size) demonstrated a significant relationship with PTS, which was greater in response the loss of a dog, relative to the loss of a cat, $F(1, 290)=7.46, p=.007, \eta^2=.025$. In addition, although those with non-working pets reported greater attachment to their pet relative to those with working pets, $F(1,281)=26.19, p<.001, \eta^2=.085$, the loss of working pets was associated with greater grief severity, $F(1,292)=46.63, p<.001, \eta^2=.138$, greater PTG, $F(1,291)=35.89, p<.001, \eta^2=.110$, and higher symptoms of PTS, $F(1,297)=75.24, p<.001, \eta^2=.202$ (see Table 2). Having another pet at the time of the loss was also associated with greater attachment, relative to those who did not have another pet, $F(1,281)=8.28, p=.004, \eta^2=.029$, along with more grief, $F(1,292)=12.95, p<.000, \eta^2=.042$, greater PTG, $F(1,291)=10.69, p=.001, \eta^2=.035$, and more PTS symptoms, $F(1,297)=10.82, p=.001, \eta^2=.035$. Finally, greater PTG was reported when the loss was not expected, $F(1,291)=5.34, p=.022, \eta^2=.018$.

The loss of a dog eliciting a greater PTS response than the loss of a cat coincides with previous research that suggested dog owners have enhanced ‘psychological ownership’ of their pet. Enhanced ownership was reflected by greater emotional attachment to dogs relative to cats, determined on the basis of owners’ willingness to pay more for life-saving surgery, medical expenses, specialty pet products and increased word-of-mouth about the pet (e.g. bringing up their pet more frequently in casual conversation) (Kirk, 2019). There is little research that compares the attachment of working and non-working pets, however, research has indicated that there are heightened emotional responses when an individual is separated from their working animal companion as they heavily rely on their pet to fulfill daily tasks (Lauren, 2017). For example, this was prominent for war veterans who had therapy dogs for managing their PTSD symptoms, many reported increased anxiety when separated from their pet (Lauren, 2017). This

could explain why working pet owners experienced greater grief severity and symptoms of PTS following pet loss. It had also been stated by war veterans that prior to obtaining their working dog, they experienced severe anxiousness, nervousness, loneliness and depression, which was heavily alleviated by their experience of having a working pet (Lauren, 2017). Which may explain why working pet owners experience greater PTG following pet loss as they are able to draw meaning from the experience of owning a working pet.

	Pet Attachment	Pet Bereavement	Post-Traumatic Growth	Post-Traumatic Stress
Type of Pet Lost				
Dog	3.12 (0.50)	2.79 (0.52)	3.09 (1.19)	2.70 (0.56)*
Cat	3.22 (0.43)	2.75 (0.56)	2.91 (1.26)	2.51 (0.60)*
Certified Working Pet	2.93 (0.43)*	3.08 (0.54)*	3.69 (0.97)*	3.02 (0.50)*
Not Certified	3.24 (0.46)*	2.65 (0.48)*	2.76 (1.26)*	2.46 (0.53)*
Another Pet at Loss	3.26 (0.47)*	2.63 (0.49)*	2.71 (1.34)*	2.49 (0.56)*
No Other Pet at Loss	3.10 (0.47)*	2.86 (0.54)*	3.20 (1.18)*	2.72 (0.58)*
Loss Expected	3.18 (0.49)	2.73 (0.53)	2.85 (1.23)*	2.64 (0.55)
Loss Not Expected	3.14 (0.46)	2.82 (0.53)	3.18 (1.26)*	2.64 (0.61)

Table 2- Means (*SD*) for responses to the pet and pet loss as a function of features of the pet loss context.

As seen in Table 3, although pet attachment was not significantly correlated with PTG or PTS symptoms, it was positively correlated with grief following the loss of the pet. The extent of grief was also positively related to both post-traumatic growth and especially with posttraumatic stress, which were also positively related.

	Pet Attachment	Pet Bereavement	Post-Traumatic Growth	Post-Traumatic Stress
Pet Attachment	-			
Pet Bereavement	.23**	-		
Post-Traumatic Growth	-.04	.27**	-	

Post-Traumatic Stress	.08	.73**	.29**	-
Social Support Perceptions	.44**	-.23**	-.14*	-.33**
Coping- Problem Solving	.03	.49**	.34**	.59**
Coping- Emotional	-.10	.75**	.34**	.76**
Coping- Avoidant	-.04	.40**	.19**	.66**

Table 3- Pearson Correlations between predictor and outcome variables with predictor, outcome and moderator variables. (2-tailed, ** $p<0.01$).

Moderation Analyses

Post-traumatic growth. As seen in Table 4, the relationship between pet attachment and PTG was only moderated by perceptions of social support, but not by problem focused, emotional or avoidant coping. Simple slope analyses conducted at 1 SD above and below the mean of social support perceptions, indicated that, as seen in Figure 1, although the relationship between pet attachment and PTG was not significant at lower levels of social support, $b = -0.30$, $se=0.22$, $p=.180$, when there were stronger perceptions of social support, as hypothesized, pet attachment was associated with greater PTG following the loss of the pet, $b= 0.57$, $se=0.26$, $p=.028$. Social support was found to strengthen the likelihood that attachment to a bereaved pet would be associated with post-traumatic growth (see also Packman, Bussolari, Katz, Carmack & Field, 2017). Conversely, perhaps due to the disenfranchised grief associated with pet loss in the absence of other supports, attachment was negatively associated with post-traumatic growth in the absence of support from human companions (Lowe et al., 2009; Wong et al., 2017).

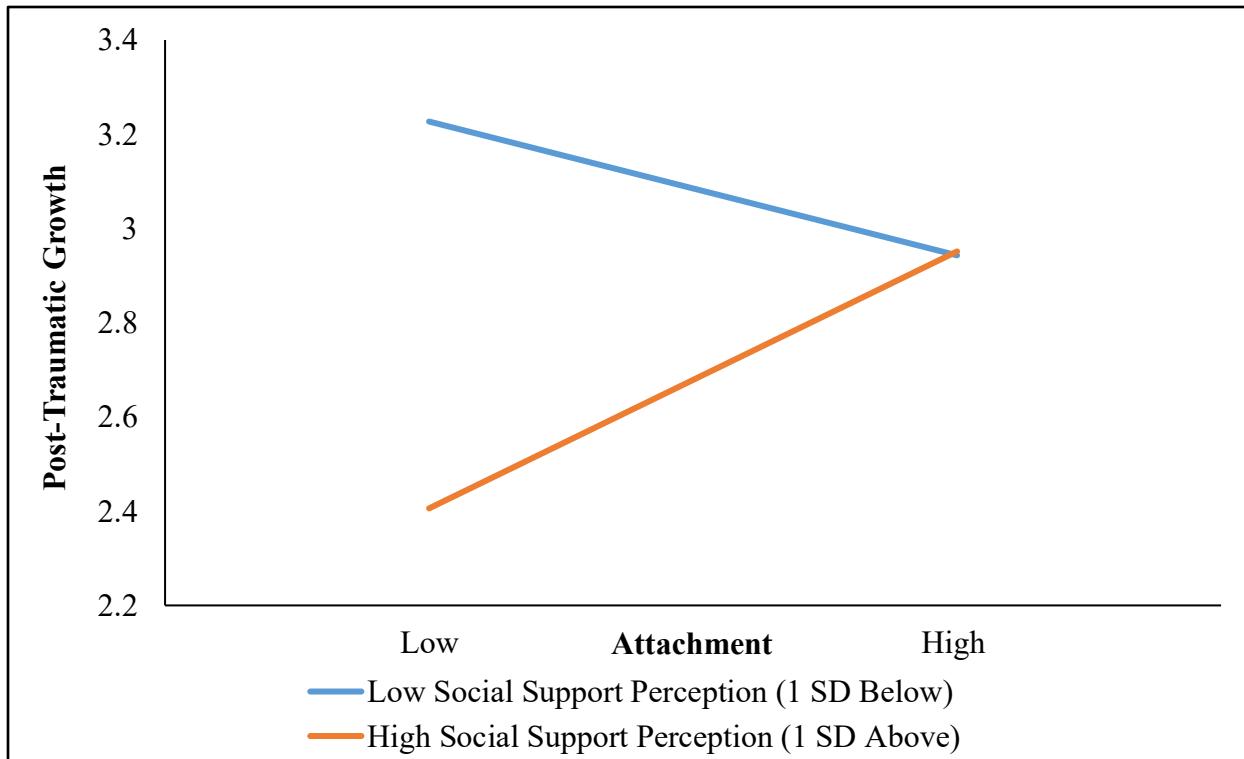


Figure 1- Simple slopes of attachment in relation to post-traumatic growth at low (1 SD below the mean) perceived social support and high (1 SD above the mean) perceived social support.

The moderating role of social support perceptions on the relationship between grief and post-traumatic growth was also significant (see Table 4). Simple slope analyses conducted at 1 SD above and below the mean for social support perceptions, indicated that, as seen in Figure 2, at low levels of perceived social support the relationship between grief and PTG was not significant, $b= 0.19$, $se=0.20$, $p=.333$. However, at higher levels of perceived social support, greater grief was related to higher levels of PTG, $b= 1.02$, $se=0.20$, $p<.000$.

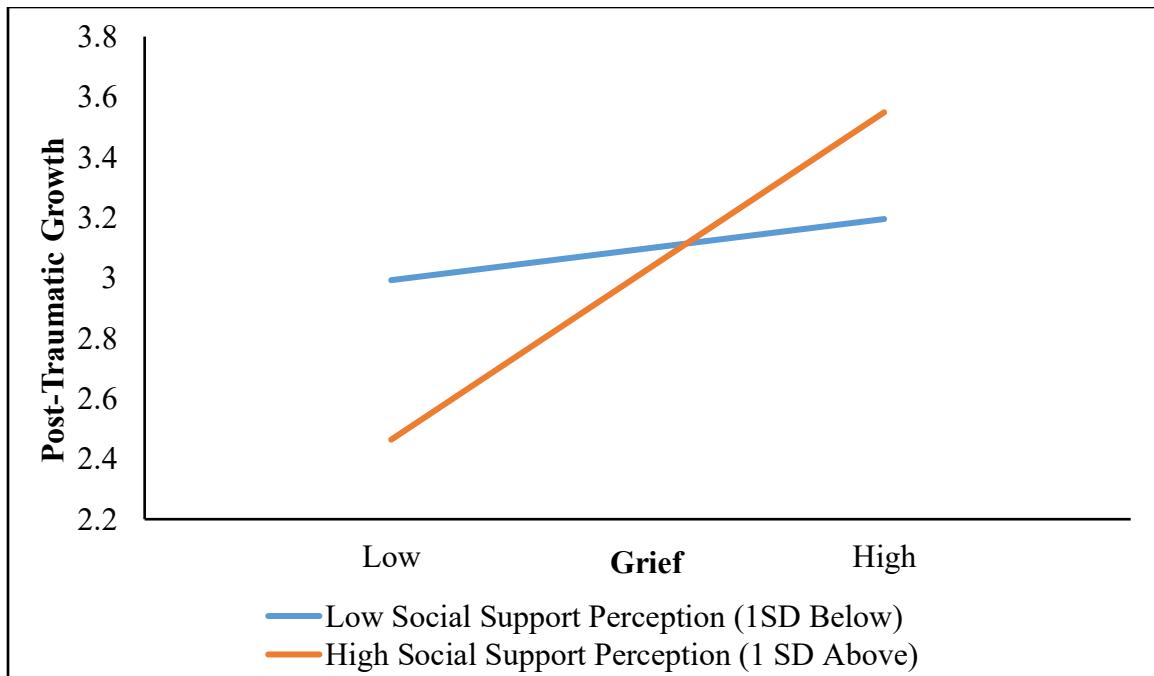


Figure 2- Simple slopes of grief in relation to post-traumatic growth at low (1 SD below the mean) perceived social support and high (1 SD above the mean) perceived social support.

The relationship between grief and PTG was not moderated by problem focused coping, however, there was a marginally significant moderating role of emotional focused coping on the relationship between grief and PTG (Table 4). Simple slope analyses conducted at 1 SD above and below the mean for emotional focused coping, indicated that, as seen in Figure 3, contrary to hypotheses, with higher endorsements of emotion-focused coping, PTG was consistently high irrespective of the level of grief experienced, $b = -0.04$, $se = 0.24$, $p = .877$. However, with less endorsement of emotion-focused coping, greater grief was related to higher levels of PTG, $b = 0.38$, $se = 0.22$, $p = .087$. The relationship between grief and PTG was not moderated by avoidant coping.

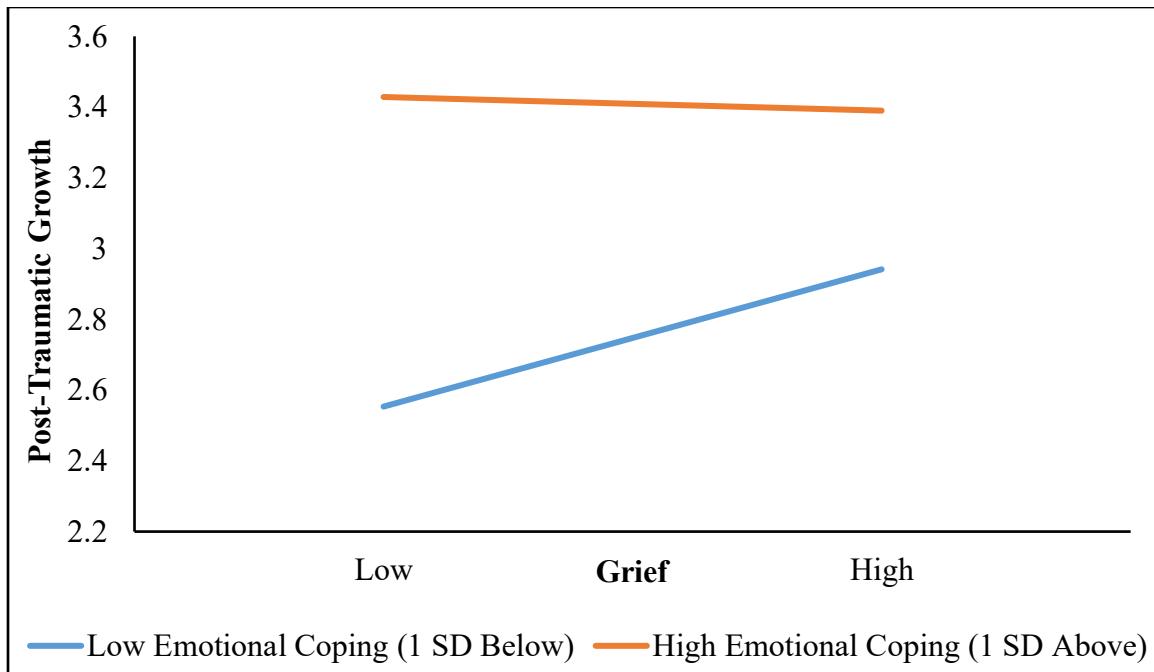


Figure 3- Simple slopes of grief in relation to post-traumatic growth at low (1 SD below the mean) endorsement of emotional coping and high (1 SD above the mean) endorsement of emotional coping.

Post-traumatic stress. Social support perceptions did not significantly moderate the relationship between attachment or grief with PTS symptoms. However, as seen in Table 4, problem-focused coping was a significant moderator of the relationship between pet attachment and PTS symptoms. Simple slope analyses conducted at 1 SD above and below the mean of problem focused coping, indicated that, as seen in Figure 4, although the relationship between pet attachment and PTS was not significant with higher problem focused coping strategies, $b = -0.17$, $se=0.10$, $p=.079$, when as problem focused coping strategies were less likely to be endorsed, as expected, pet attachment was associated with greater PTS following the loss of the pet, $b= 0.32$, $se=0.09$, $p<.001$. Problem focused coping was not a significant moderator of the relationship between grief and PTS. Emotional coping and avoidant coping did not moderate the relationship between attachment or grief with PTS.

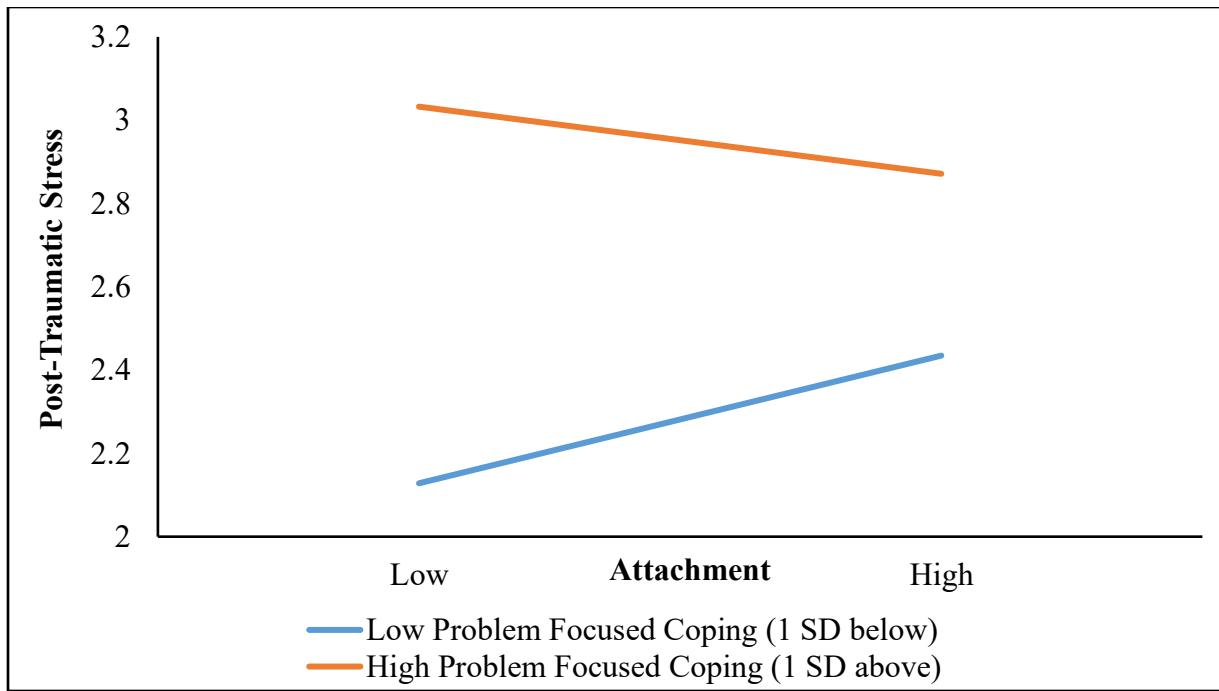


Figure 4- Simple slopes of attachment in relation to post-traumatic stress at low (1 SD below the mean) problem focused coping and high (1 SD above the mean) problem focused coping.

In sum, it appears that pet attachment was not a strong predictor of either PTG or PTS. However, under some conditions, attachment played a role in wellbeing following pet loss. In particular, when individuals perceived strong social supports, those who were highly attached were more likely to experience growth. This finding was similar to that of previous research suggesting that post-traumatic growth following pet loss is more likely to occur in the presence of high social support (Lowe et al., 2009; Spain et al., 2019; Wong et al., 2017). In addition, pet attachment was especially likely to be related to greater posttraumatic stress symptoms when lower levels of problem-focused coping were endorsed. This said, unexpectedly, higher problem-solving was related to greater symptoms of PTS. This finding is contrary to previous research which suggests that lower problem-focused coping is associated with higher depressive symptomatology and posttraumatic stress (Matheson & Anisman, 2003). It was considered that

those with higher endorsement of problem focused coping were more likely to report their PTS symptoms.

Model	Post-Traumatic Growth				Post-Traumatic Stress			
	<i>Coeff.</i>	<i>se</i>	<i>Sig.</i>	<i>Total R</i> ²	<i>Coeff.</i>	<i>se</i>	<i>Sig.</i>	<i>Total R</i> ²
Attachment	0.14	0.176	0.436		0.34	0.074	<.001	
PSS	-0.34	0.141	0.018		-0.41	0.06	<.001	
Attachment*PSS	0.72	0.268	0.008	0.055	-0.04	0.113	0.737	0.189
Attachment	-0.09	0.15	0.531		0.08	0.06	0.2	
CS Problem Solve	0.75	0.128	<.001		0.58	0.05	<.001	
Attachment*CSP	0.14	0.299	0.633	0.143	-0.42	0.118	<.001	0.359
Attachment	-0.02	0.151	0.906		0.21	0.046	<.001	
CS Emotional	0.69	0.118	<.001		0.70	0.035	<.001	
Attachment*CSE	-0.2	0.27	0.449	0.132	-0.06	0.081	0.491	0.616
Attachment	-0.04	0.157	0.822		0.14	0.057	0.019	
CS Avoidant	0.47	0.135	<.001		0.64	0.049	<.001	
Attachment*CSA	0.23	0.284	0.421	0.068	0.01	0.104	0.929	0.418
Grief	0.61	0.137	<.001		0.76	0.04	<.001	
PSS	-0.07	0.123	0.558		-0.16	0.04	<.001	
Grief*PSS	0.683	0.241	0.005	0.104	-0.12	0.08	0.134	0.562
Grief	0.35	0.151	0.021		0.63	0.047	<.001	
CS Problem Solve	0.51	0.137	<.001		0.32	0.043	<.001	
Grief*CSP	0.18	0.202	0.380	0.119	0.05	0.063	0.450	0.609
Grief	0.17	0.196	0.375		0.38	0.059	<.001	
CS Emotional	0.55	0.170	0.002		0.49	0.050	<.001	
Grief*CSE	-0.34	0.195	0.079	0.112	<0.01	0.057	0.941	0.652
Grief	0.53	0.146	<.001		0.61	0.040	<.001	

CS Avoidant	0.19	0.135	0.155		0.45	0.037	<.001	
Grief*CSA	0.30	0.204	0.146	0.086	<0.01	0.055	0.949	0.697

Table 4. Results of 2-way moderation analyses of the relations between pet attachment and grief with and PTG or PTS with moderators of perceived social support (PSS), problem focused coping strategies (CSP), emotional focused coping strategies (CSE) and avoidant focused coping strategies (CSA).

Moderating Role of the Presence of Another Pet

As hypothesized, pets can act as a social buffer for individuals with low perceived human social support. Therefore, whether or not the individual had another pet at the time of the loss must be examined as a moderator when analyzing the relationships between attachment and grief with PTG and PTS (see Table 5).

Model	Post-Traumatic Growth				Post-Traumatic Stress			
	<i>Coeff.</i>	<i>se</i>	<i>Sig.</i>	<i>Total R</i> ²	<i>Coeff.</i>	<i>se</i>	<i>Sig.</i>	<i>Total R</i> ²
Attachment	-0.12	0.197	0.533		0.16	0.090	0.078	
Other Pet	-0.59	0.158	<.001		-0.21	0.071	0.003	
Attachment*Other	0.38	0.331	0.254	0.052	-0.06	0.152	0.716	0.039
Grief	0.41	0.165	0.014		0.82	0.056	<.001	
Other Pet	-0.32	0.152	0.035		-0.049	0.051	0.333	
Grief*Other	0.49	0.295	0.098	0.100	-0.062	0.097	0.527	0.535

Table 5- Results of 2-way moderation analyses of the relations between pet attachment and grief and PTG or PTS with the moderation of having or not having another pet at the time of the loss (Other Pet).

The moderating role of having another pet at the time of the loss only approached significance with respect to the relationship between grief and post-traumatic growth (see Table 5). Simple slope analyses conducted when there was or was not a pet present, indicated that although, overall, not having another pet and grief were both positively related to PTG, as seen in Figure 5, the relationship between grief and PTG was stronger among those who had another pet following the loss, $b= 0.90$, $se=0.25$, $p<.000$, relative to those who did not, $b= 0.41$, $se=0.16$, $p=.014$. It was speculated that having another pet was a reminder of the pet that they had lost,

resulting in less growth relative to those who did not have another pet. It was also speculated that the additional pet they had was also grieving the loss of the deceased pet, once again resulting in less growth for those who had another pet compared to those who did not have another pet.

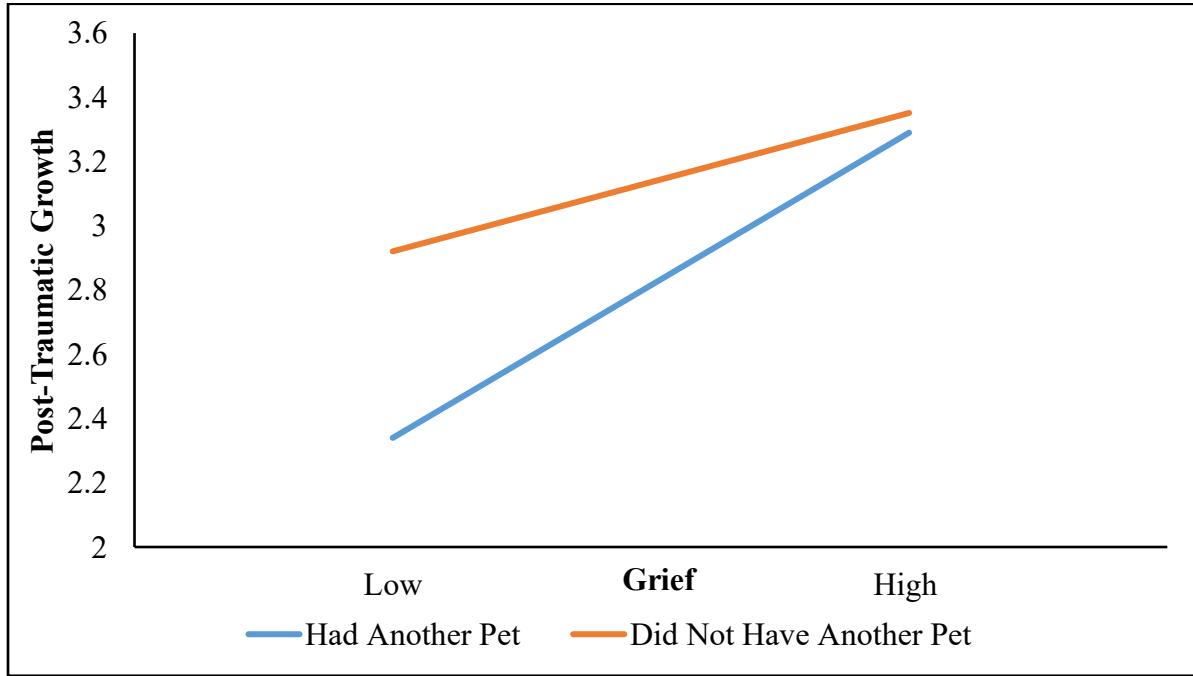


Figure 5- Simple slopes of grief in relation to post-traumatic growth for those had another pet at the time of the loss and those who did not have another pet at the time of pet loss.

Moderating Role of the Type of Pet Lost

Many previous studies that assess the outcome of pet loss either only use dog owners or do not differentiate the difference in growth or distress among different types of pets. In this study, the comparison between dog and cat owners was examined (see Table 6).

Model	Post-Traumatic Growth				Post-Traumatic Stress			
	<i>Coeff.</i>	<i>se</i>	<i>Sig.</i>	<i>Total R</i> ²	<i>Coeff.</i>	<i>se</i>	<i>Sig.</i>	<i>Total R</i> ²
Attachment	-0.24	0.193	0.207		0.06	0.087	0.514	
Type	-0.19	0.161	0.244		-0.20	0.071	0.006	
Attachment*Type	0.47	0.350	0.178	0.013	0.21	0.156	0.188	0.040
Grief	0.39	0.176	0.030		0.82	0.058	<.001	
Type	-0.17	0.150	0.259		-0.16	0.049	0.002	
Grief*Type	0.55	0.278	0.050	0.087	-0.04	0.091	0.624	0.552

Table 6- Results of 2-way moderation analyses of the relations between pet attachment and grief and PTG or PTS with the moderating the type of pet, dog vs cat, that was lost (Type).

Only the moderating role of type of pet lost (dog vs. cat) on the relationship between grief and post-traumatic growth was significant (see Table 6). Simple slope analyses indicated that, as seen in Figure 6, the relationship between grief and PTG was significant for both those who had lost a dog, $b= 0.39$, $se=0.18$, $p=.03$, and for those who had lost a cat, $b= 0.93$, $se=0.22$, $p<.000$, but the relationship was stronger among those who were grieving a cat.

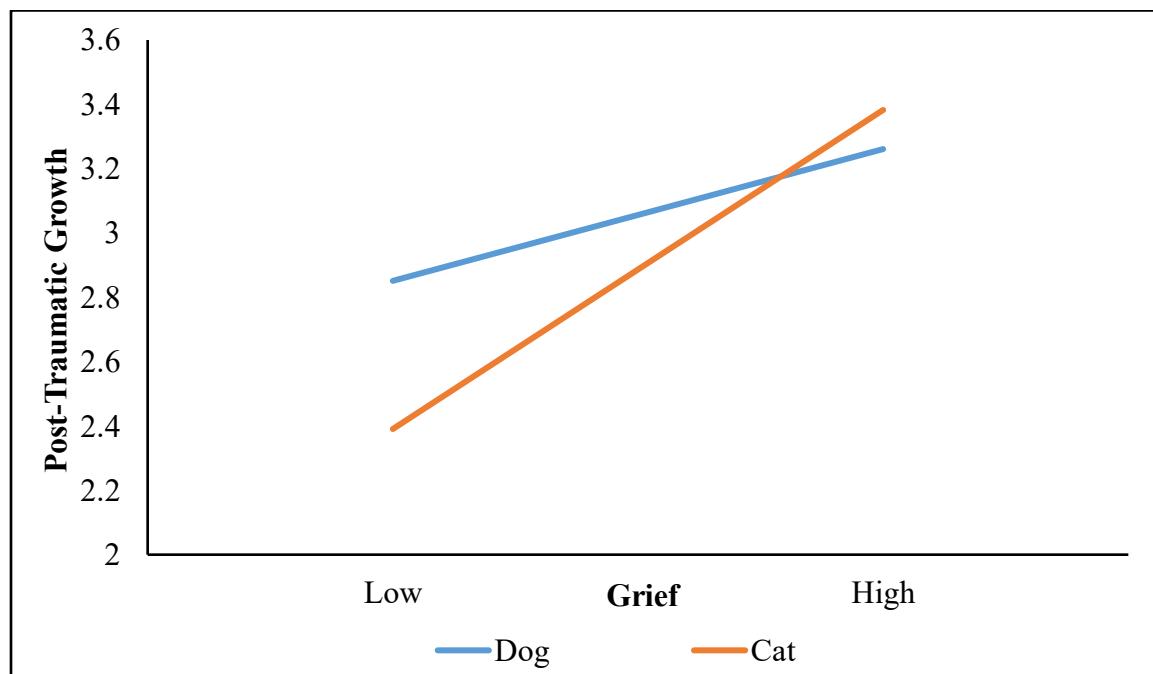


Figure 6- Simple slopes of grief in relation to post-traumatic growth for those who lost a dog compared to those who lost a cat (1 SD below and above the mean).

Previous research indicated that pets may act as a form of social support (McConnell et al., 2011) following loss, which could have contributed to the positive relationship between grief and PTG when another pet was present at the time of loss. Even with high grief, having another pet allowed for PTG. Additionally, the positive relationship between grief and growth was stronger when a cat was lost compared to when a dog was lost. As discussed previously, the study by Kirk (2019) found that dog owners had enhanced ownership emotions compared to cat

owners. Therefore, if cat owners were less emotionally invested in their ownership, it could explain why those who lost a cat were better able to find meaning in the experience as symptoms of PTS would have been lacking, ultimately resulting in greater PTG. Overall, these results suggested that pet ownership influenced the outcome of PTG. Further investigation is needed to distinguish the difference in PTG among pet owners, non-pet owners and those who have lost a pet.

Study 2

As demonstrated in Study 1, particularly for people who are attached to their pet, the loss of the pet was associated with greater grief, which in turn, was associated with posttraumatic growth, and especially with posttraumatic stress. Many previous studies have suggested that the grief following pet loss may last a minimum of 6-12 months and can be accompanied by psychological distress, depression and symptoms of post-traumatic stress disorder (PTSD) (Gerwolls & Labott, 1994; Holcomb, Williams, & Richards, 1985; Wrobel & Dye 2003).

Few studies have considered whether there is a difference among those who have another pet at the time of the loss compared to those who do not have another pet at the time of the loss.

Because pets themselves may be a strong source of social support (McConnell et al., 2011), the presence of another pet at the time of the loss, or the adoption of a new pet soon after the loss might contribute to growth following the loss. Indeed, it has been suggested that the social benefits of pet companionship are equivalent to, and independent of, the social benefits of human companionship, though they can complement each other (McConnell et al., 2011). Given this, in Study 2, in addition to assessing the well-being of a control sample of non-pet owners,

the psychological responses to trauma (or pet loss) of three groups of pet owning participants were compared, including (1) those who recently experienced pet loss and did not have another pet, (2) those who recently experienced pet loss and had another pet, and (3) those with a pet currently, but had not experienced the recent loss of pet.

The objective of Study 2 was to replicate the findings in Study 1, and to determine the role of pets as social supports during the grieving process (or in response to trauma among those who had not recently experienced pet loss). It was hypothesized that:

(1) Among those who had lost a pet, the presence or absence of another pet and human social support perceptions would interact with levels of perceived social support to influence PTG and PTS. Among those who do not have another pet at home, low levels of social support will be associated with lower PTG and higher PTS, whereas among those who currently have another pet, higher levels of PTG overall are expected, and the relationships between social support and PTG and PTS attenuated.

(2) Irrespective of pet loss, pet ownership (vs. non-pet ownership) would interact with perceived social support and coping strategies in relation to PTG and PTS (associated with past trauma). Specifically, pet owners and non-pet owners who perceive higher social support will be associated with greater PTG and lower PTS, whereas this relationship will be attenuated only among non-pet owners who report low social support (pets will act as a social buffer for current pet owners).

Method

Procedure

Participants were recruited via amazon mturk, public posters and social media posts to complete a 25-35 minute survey on the differences in stress response between pet owners, non-pet owners and those experiencing pet loss. To be eligible for the study, participants had to be 18 years of age, fluent in English and living in Canada. Participants self-identified as belonging in one of four groupings; (1) have lost a pet in the past 12 months and currently do not have another pet, (2) have lost a pet in the past 12 months and currently have another pet (from before or adopted since the loss), (3) currently have a pet and have not lost a pet in the past two years and (4) have not owned a pet in the past two years.

Participants completed the questionnaire through the Qualtrics survey platform. An informed consent document was presented at the start of the survey, and after agreeing to proceed, participants were administered a series of questionnaires with the same measures applied as in Study 1.

In Study 2, several additional features were used in Amazon mturk to control for quality survey data collection. These features included restricting the location to North America, HIT approval rates of 95%, preventing ballot box stuffing, ensuring the participant had not completed a prior batch of the survey, and making the task visibility private so that only those who met the qualifications could attempt the survey. Additionally, as in Study 1, the open-ended questions served as an outlet for those who may have experienced distress when prompted to recall the loss of their pet so that they can express their feelings about their deceased pet, but were also taken into consideration for quality control. For all participants who had lost a pet, the quality of the response, or a response in general was used to assess if the survey response was thoughtful. This was particularly important in Study 2 because this survey was open to non-pet owners and pet owners who had not lost a pet. Therefore, it was important that the pet loss sample consist of

thoughtful responses. However, in Study 2, non-pet owners and those who did not experience pet loss were exempt from the open-ended quality control question but were still liable to the Amazon mturk quality controls. As a result of the open-ended questions, 68 participants in Study 2 were eliminated from the working data file prior to analyses.

Participants were compensated \$3.00CAD following the completion of the questionnaire. This study was approved by the Carleton University Research Ethics Board – B (# 111490).

Participants

The sample comprised 638 participants (see Table 7), with the majority of participants being male. Most participants were married/ cohabiting, although a substantial proportion of the sample were either single and not seeing anyone, or in a serious relationship. Most participants had incomes below \$60,000 (median income = \$45,000-\$59,999), although the majority were employed full time. Among those who had lost a pet loss in the past 12 months, most had lost a dog. The vast majority indicated that their deceased pet was not a certified working animal. The majority in the pet loss group with no current pets reported not having another pet at the time of the loss, whereas among the group who experienced pet loss and had a current pet, most had another pet at the time of the loss and just over half of this group acquired another pet following the loss. Many of the individuals in the pet loss groups reported that the loss was expected.

Variable				
Age	34.34 years (SD=10.67)			
Category	Pet Loss, No Pet n = 125	Pet Loss, Has Pet n = 150	No Pet Loss, Has Pet n = 246	No Pet Loss, No Pet n = 117
Gender				
Female	36 (28.8%)	64 (42.7%)	85 (34.6%)	29 (24.8%)
Male	88 (70.4%)	85 (56.7%)	155 (63.0%)	88 (75.2%)
Transgender	0	1 (0.7%)	1 (0.4%)	0

Gender Non-Conforming Not Listed	1 (0.8%) 0	0 0	4 (1.6%) 1 (0.4%)	0 0
Relationship Status				
Single and not seeing anyone	40 (32.0%)	29 (19.3%)	52 (21.1%)	39 (33.3%)
In a casual relationship	6 (4.8%)	10 (6.7%)	14 (5.7%)	2 (1.7%)
In a serious relationship	14 (11.2%)	24 (16.0%)	44 (17.9%)	16 (13.7%)
Married/ Cohabiting	61 (48.8%)	82 (54.7%)	119 (48.4%)	55 (47.0%)
Separated/ Divorced	3 (2.4%)	4 (2.7%)	13 (5.3%)	2 (1.7%)
Widowed	0	0	3 (1.2%)	0
Prefer not to say	1 (0.8%)	1 (0.7%)	1 (0.4%)	3 (2.6%)
Gross Income Per Year				
Under \$15,000	11 (8.8%)	7 (4.7%)	19 (7.7%)	15 (12.8%)
\$15,000-\$29,999	16 (12.8%)	20 (13.3%)	31 (12.6%)	11 (9.4%)
\$30,000-\$44,999	23 (18.4%)	25 (16.7%)	47 (19.1%)	13 (11.1%)
\$45,000- \$59,999	21 (16.8%)	33 (22.0%)	30 (12.2%)	23 (19.7%)
\$60,000- \$74,999	20 (16.0%)	21 (14.0%)	25 (10.2%)	11 (9.4%)
\$75,000- \$89,999	13 (10.4%)	19 (12.7%)	35 (14.2%)	15 (12.8%)
\$90,000- \$104,999	5 (4.0%)	6 (4.0%)	19 (7.7%)	13 (11.1%)
\$105,000 or more	12 (9.6%)	16 (10.7%)	34 (13.8%)	8 (6.8%)
Prefer not to say	4 (3.2%)	3 (2.0%)	6 (2.4%)	8 (6.8%)
Employment Status				
Employed Part-Time	18 (14.4%)	34 (22.7%)	51 (20.7%)	17 (14.5%)
Employed Full-Time	89 (71.2%)	90 (60.0%)	141 (57.3%)	64 (54.7%)
Unemployed	10 (8.0%)	12 (8.0%)	22 (8.9%)	15 (12.8%)
Retired	3 (2.4%)	2 (1.3%)	6 (2.4%)	5 (4.3%)
Other	5 (4.0%)	12 (8.0%)	25 (10.2%)	15 (12.8%)
Type of Pet Lost				
Dog	86 (68.8%)	86 (57.3%)	N/A	N/A
Cat	30 (24.0%)	56 (37.3%)		
Other	9 (7.2%)	8 (5.3%)		
Certified Working Animal				
Service Animal	11 (8.8%)	7 (4.7%)		
Therapy Animal	5 (4.0%)	4 (2.7%)	N/A	N/A
Emotional Support Pet	24 (19.2%)	17 (11.3%)		
Not a certified working animal	84 (67.2%)	121 (80.7%)		
Another Pet at the time of loss				
Yes	18 (14.4%)	98 (65.3%)	N/A	N/A
No	107 (85.6%)	51 (34.0%)		

Did You Get Another Pet Following the Loss				
Yes	6 (4.8%)	67 (44.7%)	N/A	N/A
No	116 (92.8%)	78 (52.0%)		
Prefer not to say	3 (2.4%)	4 (2.7%)		
Was the Pet Loss Expected				
Yes	76 (60.8%)	78 (52.0%)	N/A	N/A
No	49 (39.2%)	72 (48.0%)		
Had You Experienced Any Other Loss (Generic Loss)				
Yes	66 (52.8%)	70 (46.7%)	84 (34.1%)	61 (52.2%)
No	57 (45.6%)	80 (53.3%)	156 (63.4%)	55 (47.0%)

Table 7. Study 2 Participant Frequencies (count, %).

Measures

The measures of pet attachment ($\alpha = .91$), pet bereavement ($\alpha = .90$), social support perceptions, post-traumatic growth and posttraumatic stress in addition to background information were the same as described in the Study 1.

Statistical Analyses

As in Study 1, after assessing potential covariates, the PROCESS macro for SPSS (Model 1, Hayes & Preacher, 2013) was used to conduct regression analyses between pet attachment and grief with the outcome variables (PTG and PTS), along with the moderating roles of social support perceptions and coping strategies, each in separate analyses. All continuous variables were centered to calculate cross-products; if the interaction was significant, simple slopes analyses were conducted at 1 *SD* above and below the mean of the moderating variables.

The PROCESS macro for SPSS (Model 3, Hayes & Preacher, 2013) assessed the 2 (pet loss vs. no pet loss, coded 0 ‘no’ and 1 ‘yes’) x 2 (currently have a pet or not, coded 0 ‘no’ and 1 ‘yes’) factorial relationships with post-traumatic growth and post-traumatic stress, along with the

moderating role of social support perceptions and coping strategies. All significant results from the analyses were reported in text. If the interactions were significant, simple slopes analyses were conducted at 1 *SD* above and below the mean of the continuous moderating variables. Significance was determined at $p < .05$ for all analyses.

Results and Discussion

Replication of Study 1

As in Study 1, one-way ANOVAs were conducted to assess whether differences in attachment to the deceased pet, grief, posttraumatic stress symptoms (PTS) and posttraumatic growth (PTG) were evident in relation to demographic variables and characteristics of the pet context. As seen in Table 8, males reported lower levels of attachment with their pet, $F(4, 480)=4.54, p=.001, \eta^2=.020$, along with higher PTG, $F(4, 594)=2.36, p=.053, \eta^2=.038$. In addition, compared to cat owners, dog owners reported significantly greater pet attachment, $F(2, 481)=20.00, p<.001, \eta^2=.087$, greater grief following the loss of their dog, $F(2, 489)=9.18, p<.001, \eta^2=.035$, and higher levels of both PTG, $F(2, 284)=8.37, p<.001, \eta^2=.039$, and PTS, $F(2, 482)=5.41, p=.005, \eta^2=.044$. Those whose pets were certified working animals (compared to those that were not) also reported greater grief $F(1, 486)=89.65, p<.001, \eta^2=.176$, as well as PTG $F(1, 480)=164.85, p<.001, \eta^2=.297$, and PTS, $F(1, 478)=67.35, p<.001, \eta^2=.184$, despite reporting that they were less attached to the pet, $F(1, 478)=8.79, p=.003, \eta^2=.051$. Perhaps because there was more time to demonstrate anticipatory affection toward the pet, expecting the loss was associated with greater attachment, $F(1, 481)=8.55, p=.004, \eta^2=.027$, but was also related to less grief, $F(1, 489)=3.62, p=.058, \eta^2=.050$. Getting a new pet following the loss was associated with both greater attachment, $F(2, 477)=9.10, p<.001, \eta^2=.039$, and grief, $F(2,$

$485)=4.14, p=.017, \eta^2=.047$. Finally, those participants who experienced another loss during this time frame reported significantly more grief in relation to the loss of their pet, $F(1, 485)=7.04, p=.008, \eta^2=.106$, lower levels of PTG $F(1, 588)=15.64, p<.001, \eta^2=.077$, and greater PTS $F(1, 585)=19.97, p<.001, \eta^2=.108$.

	Pet Attachment	Pet Bereavement	Post-Traumatic Growth	Post-Traumatic Stress
Gender				
Female	3.24 (0.454)*	2.40; 0.611	3.05; 1.254*	2.44; 0.521
Male	3.08 (0.439)*	2.42; 0.641	3.24; 1.302*	2.46; 0.583
Type				
Dog	3.19; 0.428*	2.48; 0.604*	3.31; 1.294*	2.53; 0.566*
Cat	3.16; 0.402*	2.37; 0.609*	2.94; 1.254*	2.47; 0.549*
Certified Working Pet	3.03; 0.355*	2.89; 0.627*	4.40; 0.761*	2.87; 0.567*
Not Certified	3.18; 0.462*	2.29; 0.555*	2.80; 1.191*	2.38; 0.513*
Another Pet at Loss	3.18; 0.442	2.37; 0.624	2.87; 1.298*	2.46; 0.570
No Other Pet at Loss	3.12; 0.447	2.44; 0.617	3.31; 1.269*	2.50; 0.554
Loss Expected	3.20; 0.443*	2.37; 0.623*	3.11; 1.290	2.46; 0.565
Loss Not Expected	3.08; 0.438*	2.48; 0.618*	3.18; 1.305	2.52; 0.559
New Pet Following Loss	3.25; 0.420*	2.42; 0.578*	3.05; 1.227	2.51; 0.519
No New Pet	2.94; 0.450*	2.39; 0.642*	3.17; 1.341	2.46; 0.592
Another Loss Experienced	3.12; 0.393	2.50; 0.626*	3.39; 1.274*	2.58; 0.561*
No Other Loss	3.16; 0.480	2.35; 0.613*	2.97; 1.281*	2.37; 0.544*

Table 8. Study 2 Means (SD) for responses to the pet and pet loss as a function of features of individuals and the pet loss context (2-tailed, * $p<0.01$).

As seen in Table 9, stronger pet attachment was related to more PTS which is distinguishable from Study 1. Additional differences included pet attachment being positively correlated with problem focused coping, and the correlation between social support and PTG was no longer significant. All other correlations replicate the findings in Study 1.

	Pet Attachment	Pet Bereavement	Post-Traumatic Growth	Post-Traumatic Stress
Pet Attachment	-			
Pet Bereavement	.16**	-		
Post-Traumatic Growth	.04	.39**	-	
Post-Traumatic Stress	.14**	.73**	.43**	-
Social Support Perceptions	.41**	-.29**	-.09	-.29**
Coping- Problem Solving	.18**	.43**	.63**	.45**
Coping- Emotional	.10	.72**	.46**	.61**
Coping- Avoidant	-.10	.31**	.40**	.43**

Table 9. Pearson Correlations between predictor and outcome variables with predictor, outcome and moderator variables. (2-tailed, ** $p < 0.01$).

Moderation Analyses

Model	Post-Traumatic Growth				Post-Traumatic Stress			
	<i>Coeff.</i>	<i>se</i>	<i>Sig.</i>	<i>R</i> ²	<i>Coeff.</i>	<i>se</i>	<i>Sig.</i>	<i>R</i> ²
Attachment	0.27	0.229	0.242		0.42	0.087	<.001	
PSS	-0.32	0.189	0.088		-0.46	0.072	<.001	
Attachment*PSS	0.9	0.456	0.049	0.027	0.04	0.170	0.800	0.166
Attachment	-0.25	0.176	0.155		0.06	0.082	0.412	
CS Problem Solve	1.65	0.134	<.001		0.48	0.063	<.001	
Attachment*CSP	-0.09	0.290	0.758	0.393	-0.15	0.136	0.279	0.216
Attachment	-0.08	0.200	0.697		0.07	0.073	0.353	

CS Emotional	1.09	0.141	<.001		0.59	0.052	<.001	
Attachment*CSE	-0.44	0.398	0.267	0.217	-0.1	0.147	0.493	0.371
Attachment	0.29	0.205	0.162		0.22	0.08	0.006	
CS Avoidant	1.15	0.166	<.001		0.52	0.066	<.001	
Attachment*CSA	-0.33	0.444	0.455	0.172	-0.28	0.174	0.111	0.229
Grief	0.90	0.134	<.001		0.66	0.042	<.001	
PSS	0.03	0.16	0.852		-0.09	0.05	0.065	
Grief*PSS	-0.89	0.257	<.001	0.185	-0.16	0.081	0.056	0.539
Grief	0.27	0.122	0.027		0.62	0.044	<.001	
CS Problem Solve	1.45	0.145	<.001		0.17	0.052	0.001	
Grief*CSP	0.32	0.197	0.106	0.405	0.1	0.07	0.166	0.565
Grief	0.22	0.179	0.216		0.57	0.056	<.001	
CS Emotional	0.85	0.195	<.001		0.14	0.061	0.023	
Grief*CSE	0.63	0.207	0.003	0.237	0.22	0.064	<.001	0.577
Grief	0.57	0.135	<.001		0.6	0.041	<.001	
CS Avoidant	0.82	0.164	<.001		0.26	0.049	<.001	
Grief*CSA	0.24	0.234	0.316	0.216	0.07	0.07	0.352	0.58

Table 10. Results of 2-way moderation analyses of the relations between pet attachment and grief with PTG and PTS with moderators of perceived social support (PSS), problem focused coping strategies (CSP), emotional focused coping strategies (CSE) and avoidant focused coping strategies (CSA).

Post-traumatic growth. As seen in Table 10, regression analyses assessing the moderating role of social support on the relationships between attachment and grief with PTG indicated that in both instances the interactions were significant. Simple slope analyses conducted at 1 SD above and below the mean of social support perceptions, indicated that, as seen in Figure 7, although the relationship between pet attachment and PTG was not significant at lower levels of social support, $b = -0.19$, $se=0.33$, $p=.560$, when there were stronger

perceptions of social support, pet attachment was associated with greater PTG following the loss of the pet, $b = 0.73$, $se=0.32$, $p=.026$. Contrary to expectations, as seen in Figure 8, the relationship between grief and greater PTG was stronger at lower, $b = 1.35$, $se=0.19$, $p<.001$, relative to higher perceptions of social support, $b = 0.45$, $se=0.18$, $p=.014$.

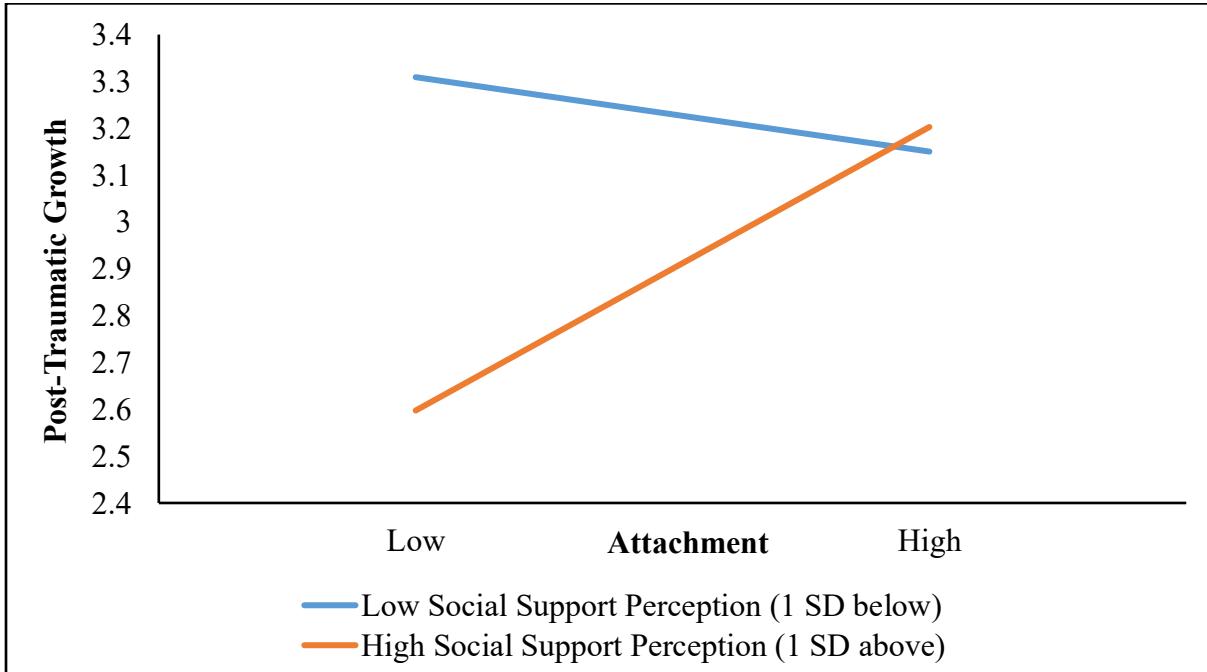


Figure 7- Simple slopes of attachment in relation to post-traumatic growth at low ($1 SD$ below the mean) perceived social support and high ($1 SD$ above the mean) perceived social support.

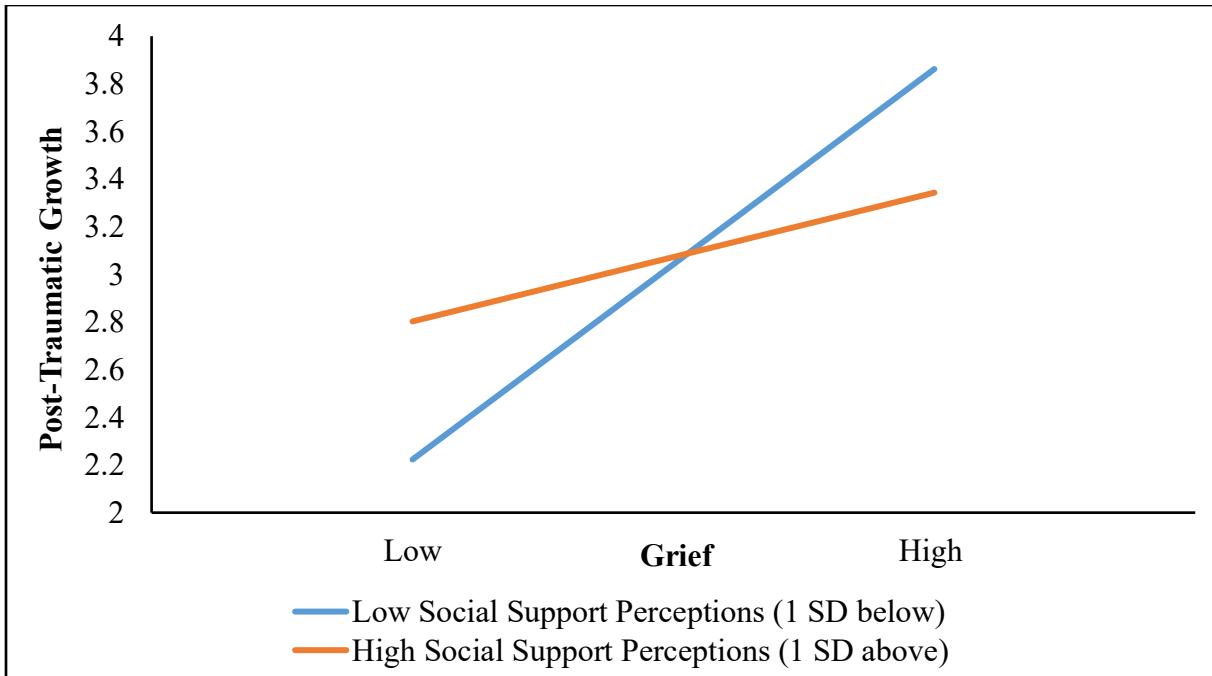


Figure 8- Simple slopes of grief in relation to post-traumatic growth at low (1 SD below the mean) perceived social support and high (1 SD above the mean) perceived social support.

Problem focused and avoidant coping did not significantly moderate the relationship between attachment and grief with PTG. However, emotional focused coping was a significant moderator of the relationship between grief and PTG, but not of attachment and PTG. (Table 10) Simple slope analyses conducted at 1 SD above and below the mean of emotional focused coping, indicated that, as seen in Figure 9, the relationship between grief and PTG was not significant at lower endorsements of emotional focused coping, $b = -0.13$, $se=0.22$, $p=.555$. However, with higher emotional focused coping, $b = 0.57$, $se=0.21$, $p=.006$, the relationship between grief and PTG was positive.

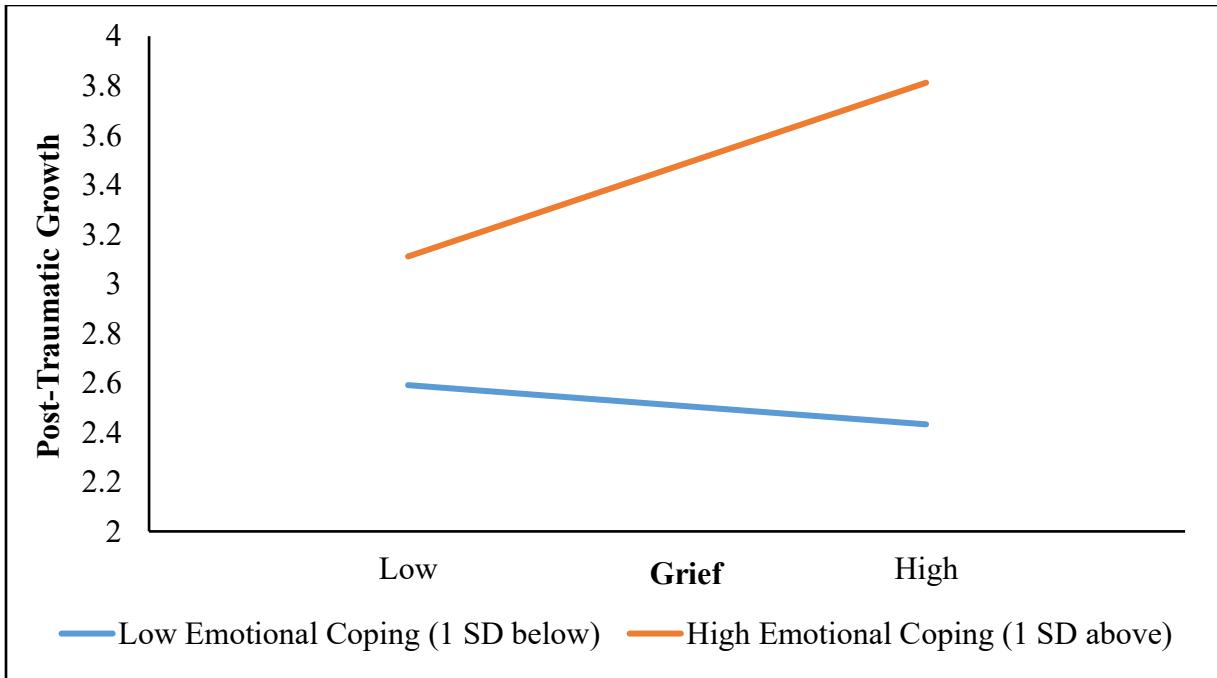


Figure 9- Simple slopes of grief in relation to post-traumatic growth at low (*1 SD* below the mean) and high (*1 SD* above the mean) endorsement of emotional focused coping.

In summary, the relationship between attachment and PTG when moderated by social support replicated the findings in Study 1, and was expected based on previous research that suggested PTG is more likely to occur in the presence of high social supports (Lowe et al., 2009; Spain et al., 2019; Wong et al., 2017). However, the moderating role of social support on the relationship between grief and PTG did not replicate Study 1. While, overall, there was a positive relationship between grief and PTG in both studies, this relationship dissipated with lower perceived support in Study 1 but was stronger in the absence of support in Study 2. Likewise, although both studies found a significant relationship between grief and PTG, the moderating role of emotional coping varied from Study 1 to Study 2, with the relationship being stronger at low levels of emotion-focused coping in Study 1, but was stronger at high levels in Study 2. This could have been the result of differences in disenfranchised grief across the two samples, but the reason for this is not clear.

Post-traumatic stress. As seen in Table 10, regression analyses assessing the moderating role of social support and coping strategies on the relationship between attachment and PTS were not significant. Assessment of the moderating roles of problem focused and avoidant coping on the relationship between grief and PTS, were also nonsignificant. However, analysis of social support and emotional focused coping as moderators of the relationship between grief and PTS indicated that in both instances the interactions were significant. Simple slope analyses conducted at 1 *SD* above and below the mean of social support perceptions, indicated that, as seen in Figure 10, the positive relationship between grief and PTS was significant for all levels of perceived social support, but the relationship was stronger with lower, $b = 0.74$, $se=0.06$, $p<.001$, relative to higher, $b = 0.58$, $se=0.06$, $p<.001$, perceptions of social support.

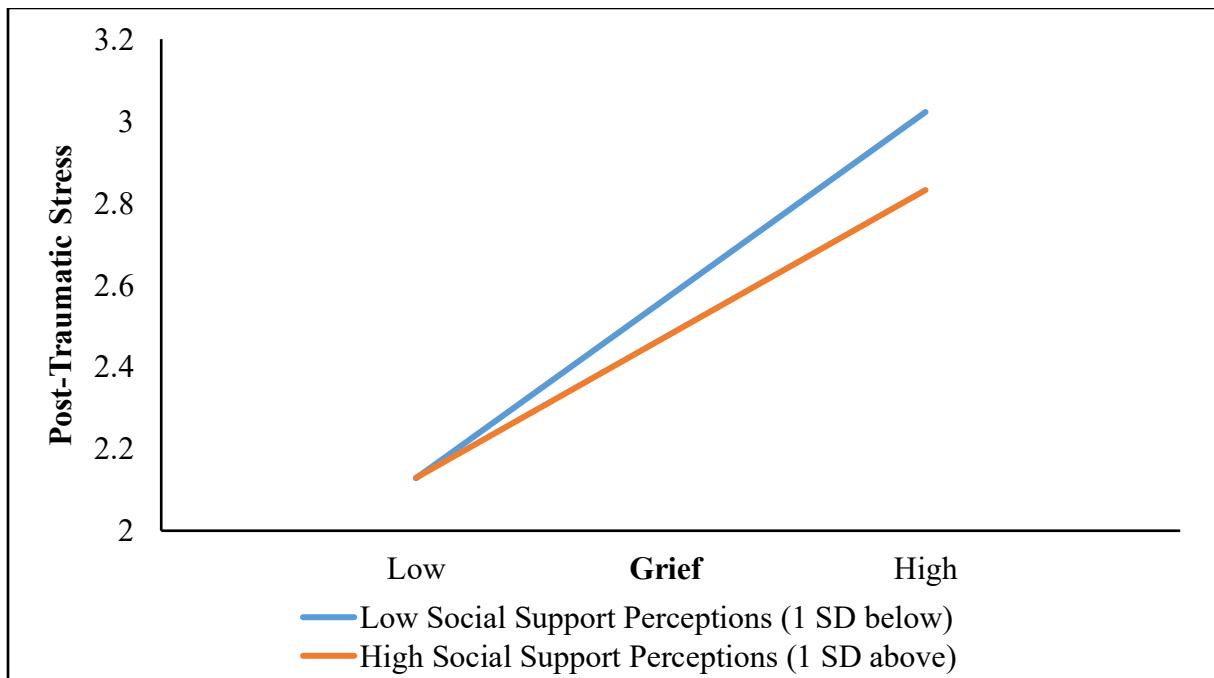


Figure 10- Simple slopes of grief in relation to post-traumatic stress at low (1 *SD* below the mean) perceived social support and high (1 *SD* above the mean) perceived social support.

Simple slope analyses conducted at 1 *SD* above and below the mean of emotional focused coping, indicated that, as seen in Figure 11, the positive relationship between grief and PTS was

at less strong at lower, $b = 0.45$, $se=0.07$, $p<.001$, compared to higher, $b = 0.70$, $se=0.06$, $p<.001$, endorsement of emotional coping.

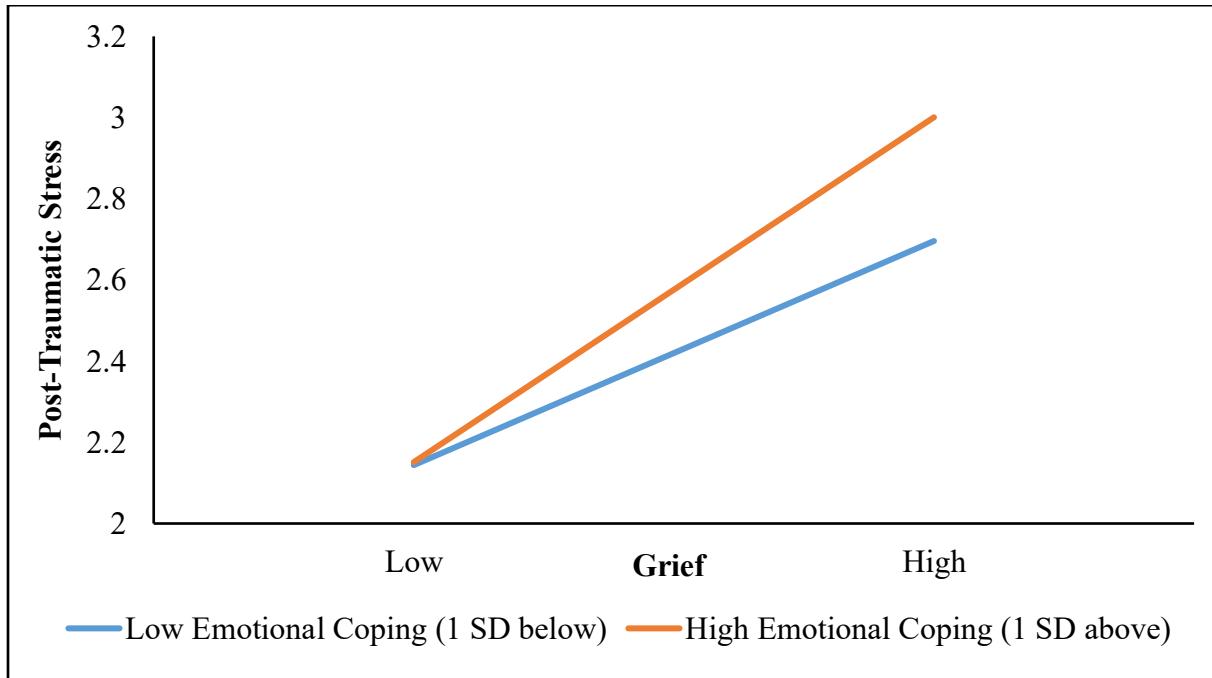


Figure 11- Simple slopes of grief in relation to post-traumatic stress at low ($1 SD$ below the mean) and high ($1 SD$ above the mean) endorsement of emotional focused coping.

In sum, differences were observed between Study 1 and Study 2 regarding the relationship between attachment and PTS, which was significantly moderated by problem focused coping in Study 1, but not in Study 2. Another difference was that social support and emotional coping were significant moderators for the relationship between grief and PTS in Study 2, however, this was not observed in Study 1. As previously stated, this can be speculated due to the differences in disenfranchised grief between the two samples.

Moderating role of the presence of another pet

Post-traumatic growth. When moderating the role of social support on the relationship between pet loss and having another pet with PTG was assessed, the overall model was not significant, $R^2= 0.02$, $F(7,584)= 1.73$, $p= 0.099$, nor were any of the main effects or interactions.

When moderating the role of problem focused coping on the relationship between pet loss and having another pet with PTG was assessed, there was a positive relation between problem-focused coping and PTG, $b=1.37$, $se =0.20$, $p<.001$. The 2-way interaction between pet loss and having another pet was also significant, $b=-0.44$, $se=0.18$, $p=.018$, in that pet loss was associated with lower PTG when they had another pet, $b=-0.23$, $se =0.12$, $p=.042$ (lost a pet $M = 2.98$, $SD = 1.28$; had not lost a pet $M = 3.10$, $SD = 1.22$). When another pet was not present, pet loss was not significantly related to PTG, $b=0.20$, $se =0.14$, $p=.168$ (lost a pet $M = 3.40$, $SD = 1.41$; no pet loss $M = 3.28$, $SD = 1.28$). Currently having a pet did not predict PTG, nor were there any further significant interactions.

When the moderating role of emotional focused coping was assessed, while the main effects for either having lost a pet, $b=-0.09$, $se =0.16$, $p=.584$, or currently having a pet, $b=-0.17$, $se =0.14$, $p=.233$, remained nonsignificant, emotion-focused coping was related to higher PTG, $b=0.72$, $se =0.25$, $p=.005$. In addition, emotion-focused coping marginally interacted with pet loss to influence PTG, $b=0.58$, $se =0.31$, $p=.065$, and further contributed to a marginal 3-way interaction between pet loss, having another pet and emotional coping, $F(1,579)=3.57$, $p=.059$. Simple effects analysis indicated that when participants were less likely to endorse emotion-focused coping, having lost a pet or currently having one was not associated with PTG, $F<1$. However, as seen in Figure 12, when emotion-focused coping was more strongly endorsed, among those who lost a pet, having another pet (compared to not having another pet) was associated with lower PTG, $b=-0.34$, $se =0.18$, $p=.054$; among those who had not lost a pet, the

relationship between having another pet (compared to not having a pet) and PTG was not significant, $b=0.001$, $se =0.23$, $p=.986$. These results are contrary to what was expected and may be the result of the current pet serving as a reminder of the loss.

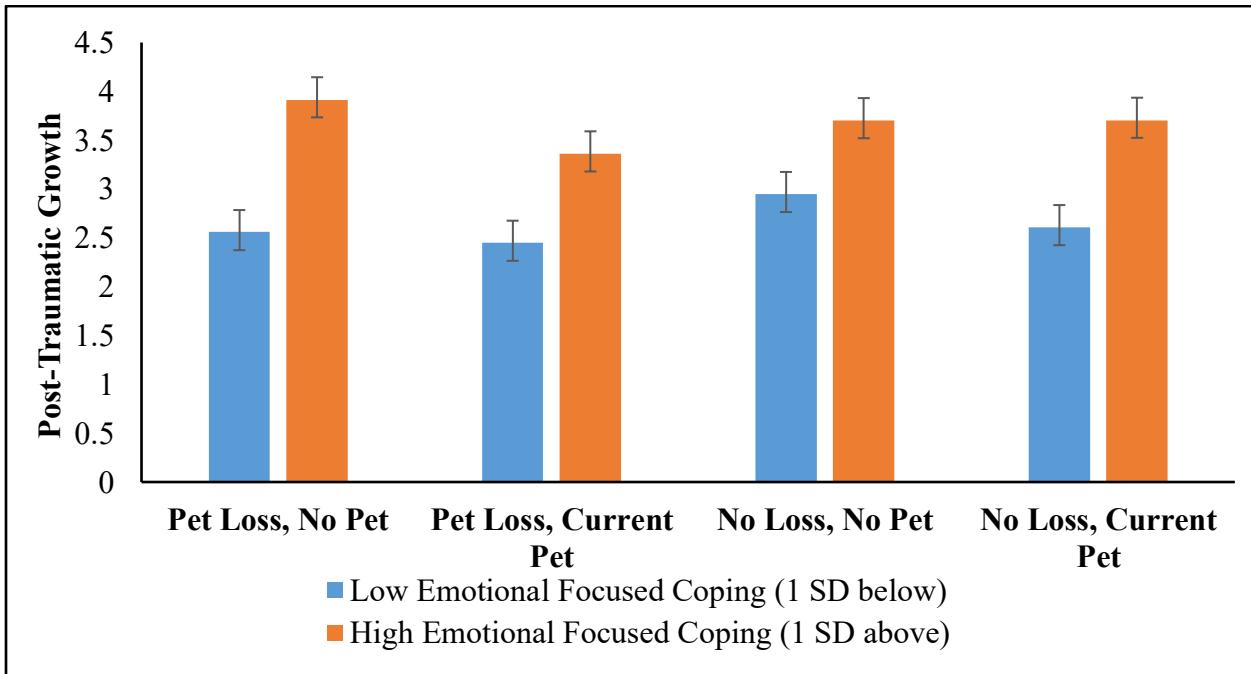


Figure 12- The effects of pet loss and having another pet on PTG, moderated by endorsement of emotional focused coping strategies.

Like emotion-focused coping, avoidant coping was also marginally related to greater PTG, $b=0.51$, $se =0.27$, $p=.063$, and interacted with pet loss to influence PTG, $b=0.77$, $se =0.35$, $p=.031$. The 3-way interaction between pet loss, having a pet and avoidant coping was marginally significant, $F(1,584)=3.53$, $p=.061$. Simple effects indicated that when participants were unlikely to endorse avoidant coping, having lost a pet or currently having one was not associated with PTG, $F<1$. However, as seen in Figure 13, when avoidant coping was endorsed, among those who lost a pet, not having another pet (compared to having another pet) was associated with greater PTG, $b=0.47$, $se =0.22$, $p=.034$; among those who had not lost a pet, the relationship between currently having another pet (compared to not having a pet) and PTG was not significant, $b=0.08$, $se =0.19$, $p=.695$.

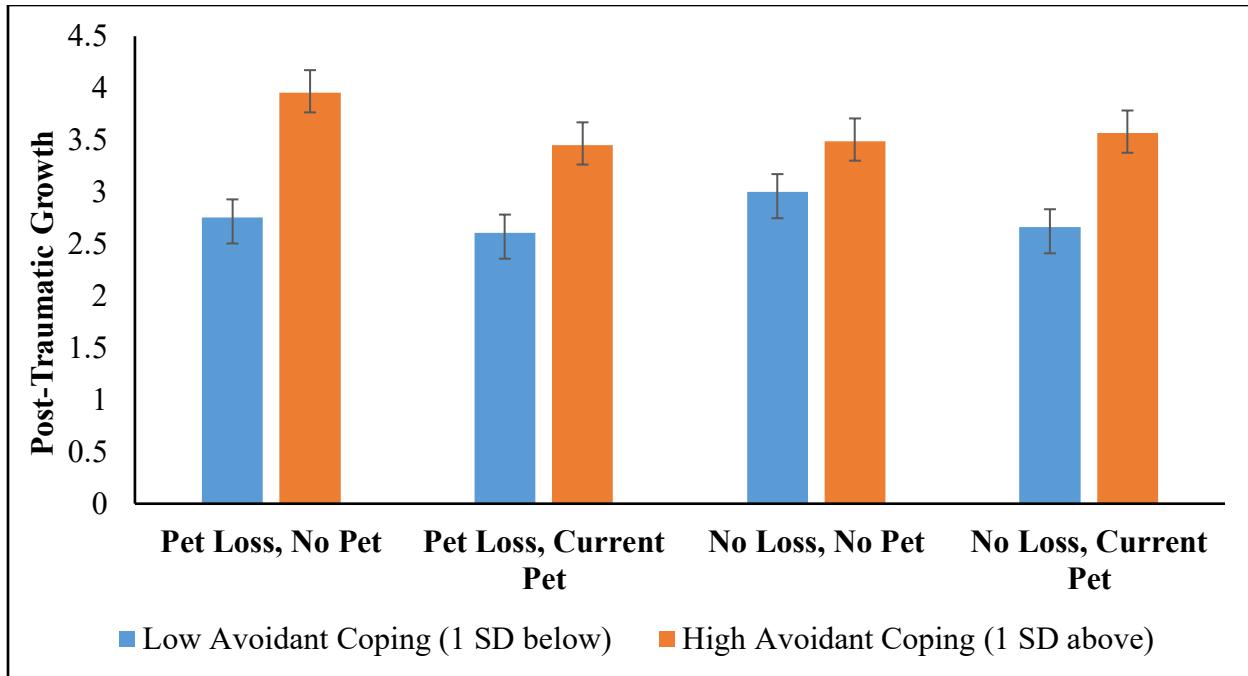


Figure 13- The effects of pet loss and having another pet on PTG, moderated by endorsement of avoidant coping strategies.

Post-traumatic stress. The moderating role of social support on the relationship between pet loss and having a pet with PTS indicated that the main effect for pet loss was associated with greater PTS, $b=0.16$, $se = 0.07$, $p=.023$, and social support was associated with lower PTS, $b=-0.29$, $se = 0.10$, $p=.005$. None of the interactions were found to be significant.

When moderating the role of problem focused coping on the relationship between pet loss and having another pet with PTS was assessed, the main effect for having lost a pet remained significant, $b=0.23$, $se = 0.07$, $p=.001$. There was also a positive relation between problem-focused coping and PTS, $b=0.24$, $se = 0.10$, $p=.012$. Additionally, there was a significant 2-way interaction between problem-focused coping and pet loss, $b=0.39$, $se=0.13$, $p=.003$, in that the effects of pet loss on PTS were greatest when problem-focused coping was high, $b=0.28$, $se = 0.06$, $p<.001$, in that PTS was higher among those who had lost a pet ($M = 2.80$, $SD = 0.52$), than among those who had not ($M = 2.52$, $SD = 0.52$). These effects dissipated with lower levels of problem-focused coping, $b=-0.01$, $se = 0.06$, $p=.858$ (lost a pet $M = 2.28$, $SD = -0.52$; no pet

loss $M = 2.27$, $SD = -0.52$). Currently having a pet did not predict PTS, nor were there any further significant interactions.

When examining the moderating role of emotional focused coping, only the main effect of emotional focused coping being associated with greater PTS was significant, $b=0.58$, $se=0.12$, $p<.001$.

Finally, pet loss continued to be associated with greater PTS, $b=0.21$, $se =0.07$, $p=.003$ when considering the moderating role of avoidant coping. The 2-way interaction between pet loss and avoidant coping was also associated with PTS, $b=0.44$, $se =0.15$, $p=.005$, as was the 3-way interaction between pet loss, having a pet and avoidant coping, $b=-0.41$, $se =0.19$, $p=.034$. Simple effects analysis indicated that when participants were less likely to endorse avoidant coping, having lost a pet or currently having one were not associated with PTS, $Fs<1$. However, as seen in Figure 14, when avoidant coping was endorsed, among those who currently had another pet, pet loss was mildly associated with greater PTS, $b=0.16$, $se =0.08$, $p=0.055$, whereas among those who did not have another pet, the loss of a pet was more strongly associated with higher PTS, $b=0.42$, $se =0.10$, $p<.001$.

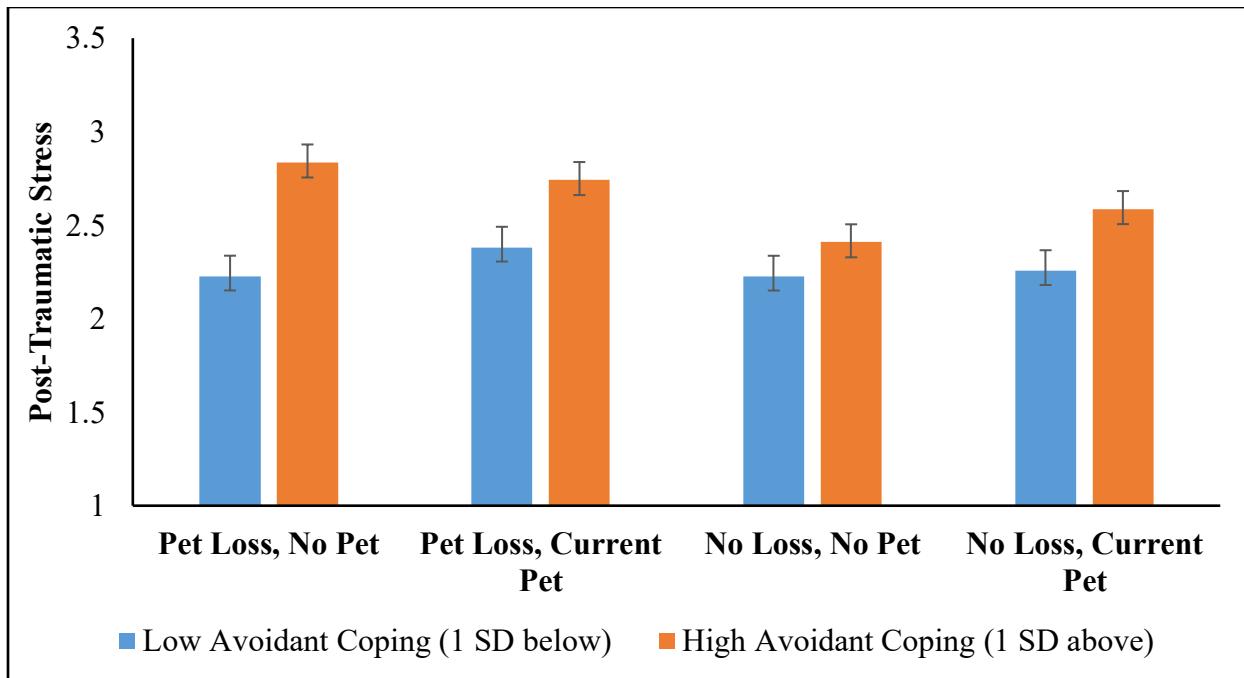


Figure 14- The effect of pet loss and having another pet on PTS, moderated by endorsement of avoidant coping strategies.

General Discussion

The present research explored the experience of pet loss and how attachment and grief were associated with post-traumatic growth (PTG) or post-traumatic stress (PTS). Of particular interest was the experience of PTG following pet loss. While much of past research assessing the effects of pet loss has focused on outcomes of depression (Cordaro, 2012) or posttraumatic stress (Hunt et al., 2008), few studies have focused on the experience of growth (Bussolari et al., 2019). The present studies considered that the loss of a pet to which the individual was strongly attached would be associated not only with greater distress, but under some conditions might also be associated with growth. In the present study, attachment to a deceased pet was related to greater grief regarding the loss but was not in fact directly related to posttraumatic stress or posttraumatic growth. The importance of pet attachment has been emphasized as an indicator of the quality of pet ownership and experiencing positive or negative benefits when the pet is alive. However, when assessing the outcome of pet loss, perhaps the focus should shift to variables

(e.g. depression and anxiety) that are considered in grief and death research, as in the case of human loss. Previous research has documented that grief was greater following the loss of a beloved pet (Field et al., 2009), there is conflicting evidence as to whether pet ownership and attachment has a positive (Zilcha-Mano et al., 2012) or negative (Peacock, Chur-Hansen, Winefield, 2012) effects on well-being. Therefore, it was important to identify whether there might be conditions under which attachment was associated PTG or PTS.

Previous research has suggested that PTG can be achieved following pet loss in the presence of social supports (Spain et al., 2019). In this regard, social support has been found to serve as a protective factor against the negative emotional consequences of many stressors, and can even promote PTG (Packman, et al., 2017). Likewise, relating to others and sharing the experience of pet loss with family and friends promoted PTG following pet loss (Packman, et al., 2017). Others found that those who reported high levels of social support from family, friends and counsellors not only reported less feelings of isolation, but also greater PTG following pet loss (Spain et al., 2019). Consistent with past research, in the present study, the strength of attachment to the deceased pet was found to be associated with PTG when the individual had a strong social support network, whereas this was not the case in the absence of social support. Essentially, it appears that social support may be an important aspect of finding meaning in the experience when attached pet owners are experiencing pet bereavement. Those with high social support will be more likely to find meaning in the loss and experience psychological growth, whereas those without such social supports may be more vulnerable and may require other avenues of coping to achieve PTG.

When facing a significant stressful event, coping strategies will often influence the psychological outcomes (Folkman & Lazarus, 1988). In this regard, previous research has linked

problem focused coping to positive emotional outcomes while avoidant and emotional coping have been linked to negative emotional outcomes (Folkman & Lazarus, 1988). Thus, as pet loss can be a significant stressor, it is important to consider the coping strategies implemented by those grieving. The strength of attachment to the deceased pet was found to be associated with greater posttraumatic stress in the absence of problem focused coping. Previous studies have concluded that low endorsement of problem focused coping was associated with depressive symptoms (Matheson & Anisman, 2003), the current study suggests that this is also the case for those experiencing pet loss. Given these findings, it is important to ensure that individuals who are attached to their pet employ appropriate coping mechanisms to prevent high depressive symptomology following pet loss.

In short, the findings of the present study suggest that pet attachment was associated with growth under high social support conditions, and with greater distress in the absence of problem focused coping. This provides valuable information that can be utilized in grief counselling following pet loss. Counsellors can help ensure that their clients have proper support systems and coping strategies in place to minimize the distress following pet loss and promote PTG. Posttraumatic growth may not be possible to achieve in every situation, but it is important that the correct information is utilized to give everyone an opportunity to achieve PTG.

In addition to attachment, it was also important to assess the influence of grief on the outcome of PTG and PTS, as previous studies have found similarities in the grief of pet loss and human loss (Podrazik et al., 2000). It has been found that grief severity influences psychological distress (Wrobel & Dye, 2003) and growth (Spain et al., 2019) following the loss of a pet. In the current studies, a strong relationship was found between grief and posttraumatic stress, which much like other research (Worbel & Dye, 2003) emphasizes the negative psychological

outcomes that may result from pet loss. This relationship between grief and posttraumatic stress was evident irrespective of perceived social support and coping strategies. However, contrary to the hypothesis, this relationship was strongest when greater social support was perceived. As there is no existing research that would allow us to predict such a finding, it might be speculated that the ability to turn to their support networks to share their grief might have prolonged rumination (a form of emotion focused coping) about the loss and perhaps exacerbated, rather than alleviated the despair at least within the 12 month period following the loss. Alternatively, given the correlational nature of this study, it might be that those who were already contending with prior traumatic stressors culminating in posttraumatic stress were sensitized to the loss, hence experiencing greater grief and the need to share with others.

Although Study 1 pointed to the role of problem focused coping in exacerbating the relationship between grief and PTS, Study 2 found that higher endorsement of emotional focused coping intensified the relationship between grief and PTS. Both findings are consistent with previous research that has suggested low endorsement of problem focused coping and high endorsement of emotional coping are associated with symptoms of depression (Matheson & Anisman, 2003). Of greater interest were the conditions under which grief might evolve into growth. Unlike the relationship with attachment, both current studies demonstrated a direct positive relationship between grief and PTG, but like attachment this relationship depended on levels of perceived social support. However, the findings across the two studies were not consistent. Specifically, as observed in previous research (Spain et al., 2019), Study 1 found the relationship between grief and PTG was strongest when perceived social support was high, whereas in Study 2, this relationship was strongest when perceived social support was scarce. Grief is different for each individual situation, therefore, perhaps the differences from the Study

1 to Study 2 findings suggest that it is difficult to predict the outcome of PTG due to the individuality of grief. Previous trauma research (not related to pet loss) has also found that even when grief severity was high, PTG can still be experienced in the presence of low disenfranchised grief (Morris et al., 2005). This implies that even when social support is low and grief severity is high, PTG can still be achieved so long as disenfranchised grief is minimized. Disenfranchised grief is grief that is not acknowledged or recognized as emanating from a significant loss, especially when comparing pet loss to human loss (Packman et al., 2014). Previous research has found that disenfranchised grief inhibits growth (Spain et al., 2019), and is most likely to be minimized with supportive social relationships. This may suggest that the role of disenfranchised grief is more important than perceived social support when examining the relationship between grief and PTG. Further research is needed to directly assess the role of disenfranchised grief in relation to growth following pet loss.

The role of coping in the relationships between grief and posttraumatic growth was also considered in the present studies. In this regard, emotion focused coping played a particularly important role. As hypothesized, with higher endorsement of emotional focused coping, a negative relationship between grief and growth was found in Study 1. However, Study 2 found a positive relationship between grief and PTG with higher endorsement of emotional focused coping. Although speculative, the contradictory findings between the present studies could reflect variations in the combinations of coping strategies, social support, and disenfranchised grief across the two studies. Coping is more effective and can lead to positive psychological outcomes when multiple strategies are employed (Anisman, 2014), and so perhaps the inconsistent patterns have more to do with differences in combinations of resources available

(recall that the relationship as a function of social support resources also varied across the two studies), rather than any single method of contending with the situation.

Few studies have considered whether there is a difference among those who have another pet at the time of the loss compared to those who do not have another pet at the time of the loss. As pets themselves may be a strong source of social support (McConnell et al., 2011), the present studies examined whether the presence of another pet at the time of the loss, or the adoption of a new pet soon after the loss was associated growth following the loss. Indeed, Study 1 found that grief was associated with greater growth when another pet was present at the time of the loss.

Study 2 assessed the difference between those who had or had not experienced pet loss among those who currently did or did not have another pet. This relationship appeared to depend on the coping strategies endorsed. Such relations were not evident in the absence of either emotion focused or avoidant coping. However, both PTS and PTG were lower among those who lost a pet and had another pet when avoidant coping was endorsed. When emotional focused coping was endorsed, those who had lost a pet and had another pet also reported lower PTG. Problem focused coping did not moderate the effects of having another pet on posttraumatic stress or growth following loss. Taken together, contrary to expectations, having another pet at the time of loss did not appear to promote growth following pet loss, particularly among those who employed emotional or avoidant coping strategies. Perhaps those who were having the greatest difficulty contending with the loss might have been the most likely to seek the company of another pet. However, this is dependent on the type of coping strategies used.

The implications of this study acknowledge the impact of pet loss on well-being and will hopefully limit future expressions of disenfranchised grief. The current study observed a stronger

relationship between grief and PTS when social support was high, this is reminiscent of the effects of disenfranchised grief, wherein those who were more likely to share their experience with their social supports may have been exposed to more encounters with others who did not see pet loss as a significant stressor. These unexpected findings with perceived social support should lead future research, and a need to better understand the notion of disenfranchised grief following pet loss. Understanding the psychological dynamics associated with disenfranchised grief following the loss of a beloved pet could have implications for policies regarding pet bereavement in the workplace by encouraging greater compassion for the bereaved owner. The current studies also provide more information for grief counselling so that counsellors can enable their clients to utilize problem focused coping to maximize PTG and forgo emotional focused coping to minimize PTS when experiencing pet loss. The conflicting evidence on the impact of high social support also implies that perceived support may not directly relate to those who empathize with pet loss. Furthermore, there is a greater need for pet loss specific support groups so that bereaved owners can have a safe place to grieve with those who have experienced similar loss. Ultimately the implications of this study conclude that pet loss should be acknowledged in workplace bereavement policies, in clinical settings and through outreach support groups to help bereaved owners achieve PTG.

Limitations

Several limitations qualify the results of the present studies. The symptoms of grief following pet loss might last a minimum of 6 to 12 months (Wrobel & Dye, 2003). This guided our decision regarding eligibility to participate in the studies, such that the loss of the pet had to have been within the past 12 months. However, no assessment was included regarding the exact time that had passed since the pet loss when participants completed the survey. This could have

been important in the present study by providing insight regarding variations of time following the loss to achieve PTG. Though it is possible that every situation is different and there is no set timeline to achieve PTG, this could have at least been confirmed had there been a timeline included in the survey questions. A timeline could also have provided insights as to whether both PTG and PTS can be experienced concurrently or sequentially.

Though a measure for pet bereavement was used to determine grief severity, a specific measure for disenfranchised grief was not included. Previous studies found disenfranchised grief to be a moderating variable for the relationship between grief severity and PTG (Morris et al., 2005). Inclusion of a measure of disenfranchised grief might have allowed us to account for the unexpected findings regarding the moderating roles of social support and coping strategies in the present findings.

Another limitation was that a much larger proportion of males that responded to the survey compared to females, and there were few responses from transgender and gender non-conforming individuals. Previous studies have identified that males and females report differently on the length of symptoms of grief severity (Wrobel & Dye, 2003), and potentially respond differently to emotional and problem focused coping. Therefore, the high proportion of male participants could dissipate the generalizability of the results. It is unknown as to why there were more male than female participants.

Finally, there are limitations associated with the survey platform. Self-report surveys run the risk of retrospective recall bias, which makes it difficult to make accurate comparisons among participants. This study was also correlational, which only determines if there is a relationship between the variables, but further research is needed to determine causation. A recent study has also suggested that the mturk platform, though efficient, may have some issues

with replicating findings (Chmielewski & Kucker, 2020). Though validation measures were used in the current study, these recent findings suggest that mturk screening may not be as reliable as initially anticipated. It has been observed that attention checks no longer catch participants who provide invalid data (Sylaska & Mayer, 2019), and dropping participants for failing validity tests have been found to bias samples (Chmielewski & Kucker, 2020).

Conclusion

In sum, the findings of this research suggest that, while unquestionably distressing, the pet loss can be associated with growth and finding meaning in the experience if appropriate social supports and coping mechanisms are in place. Greater attachment and greater grief regarding deceased pet predicted growth in the presence of greater perceived social supports. High problem focused coping strengthened the relationship between attachment and PTG while emotional focused coping strengthened the relationship between grief and PTS. This said, it is more likely that using a combination of coping strategies that fit with the resources at hand (e.g., social supports, presence of another pet) may be the most effective way to achieve growth and diminish distress following pet loss.

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Appendices

Appendix A	Recruitment Notice, Study 1
Appendix B	Informed Consent, Study 1
Appendix C	Debriefing Form, Study 1
Appendix D	Background Information
Appendix E	Pet Attachment Survey
Appendix F	Pet Bereavement Questionnaire
Appendix G	Coping Strategies Scale
Appendix H	Social Perceptions Scale
Appendix I	Unsupported Social Interactions Inventory
Appendix J	Daily Hassles Scale
Appendix K	Life Events Questionnaire
Appendix L	CES Depression Scale (10-item version)
Appendix M	Health Questionnaire
Appendix N	Quality of Life Questionnaire
Appendix O	3-item Loneliness Scale
Appendix P	Impact of Events
Appendix Q	Post-Traumatic Growth Inventory
Appendix R	Open-ended Questions
Appendix S	Informed Consent, Study 2
Appendix T	Debriefing Form, Study 2
Appendix U	TCPS2 Certificates

Appendix A

Recruitment Notice, Study 1

Coping with Pet Loss

What are we hoping to learn?

This study aims to investigate people's reactions to pet loss, including how they cope, supports that they have, and how these are related to their emotional well-being. With pet companions playing a key role in some people's lives, it is important to learn more about the implications of pet loss on well-being.

Who can participate?

To participate in this study, you must be:

- 18+ years old
- Have lost a pet in the past year
- Able to speak and understand English

What's involved?

You will be asked to fill out a (25-30 minute) questionnaire regarding your experience following the loss of your pet. Participation is completely voluntary and you are free to skip any step or question that you are not comfortable with. As a thank-you for participating, you will receive a \$5.00 CAD compensation.

Who is running this study?

This study is being conducted by Veronica Zuccala, a graduate student in Carleton University's Neuroscience department under the supervision of Dr. Kim Matheson.

Researcher contact information:

Veronica Zuccala (Graduate Researcher) Department of Neuroscience, Carleton University
Email: veronica.zuccala@carleton.ca

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Appendix B

Informed Consent, Study I

Title: Coping with Pet Loss

The lead researcher for this study is Veronica Zuccala in the Department of Neuroscience at Carleton University. She is working under the supervision of Dr. Kim Matheson in the Department of Neuroscience at Carleton University.

Purpose: This study aims to investigate people's reactions to pet loss, including how they cope, supports that they have, and how these are related to their emotional well-being. With pet companions playing a key role in some people's lives, it is important to learn more about the implications of pet loss on well-being.

Eligibility criteria:

To participate in this study, you must be:

- 18+ years old
- Have lost a pet within the past year
- Able to speak and understand English

What are we asking you to do?

We will be asking you to fill out a number of questionnaires relating to your background, your feelings towards your pet(s), coping with the loss, social supports, mental health, and sense of wellbeing.

This study should take approximately 25-30 minutes to complete.

For participating in this study, you will receive \$5.00 compensation.

Potential risks or causes of discomfort for participants

Some participants may feel uncomfortable describing your feelings following the loss of a pet. You may skip over any questions that you wish and there will be contacts available following the study in the event that you wish to seek support for your well-being.

Anonymity and confidentiality

All responses will be kept anonymous and confidential. Your responses may be used in future presentations or publications on the research topic; any reports on the data will use average responses, although quotes might be taken from any open-ended responses you provide.

All research data and any notes will be stored on a password-protected computer. Any hard copies of data (including any handwritten notes or USB keys) will be kept in a locked cabinet at

Carleton University. Research data will only be accessible by the researchers and the research supervisors.

Once the project is completed, all research data will be kept for ten years and potentially used for other research projects on this same topic. At the end of ten years, all research data will be securely destroyed. Electronic data will be erased and hard copies will be shredded.

Right to withdraw from this study

Participation in this study is entirely voluntary. At any point during the study you have the right to not complete certain questions or to withdraw. Regardless of your choice to withdraw or to skip any questions, you will still receive \$5.00 compensation. Please note that once you have completed the study, you will no longer be able to withdraw your data as the research team will not be able to identify individual contributions.

The research has been cleared by Carleton University Research Ethics Board-B (Clearance #110592).

If you have any ethical concerns with the study, please contact Dr. Bernadette Campbell, Chair, Carleton University Research Ethics Board-B and the Carleton University Research Compliance Office (by phone 613-520-2600 ext. 4085 or by email ethics@carleton.ca).

Should you have any other questions or concerns related to your involvement in this research, please contact:

Researcher contact information:

Veronica Zuccala (Graduate Researcher) Department of Neuroscience, Carleton University
Email: veronica.zuccala@carleton.ca

Dr. Kim Matheson Department of Neuroscience, Carleton University
Tel: 613 520-2600, ext. 2652; Email: kim.matheson@carleton.ca

Please indicate whether you agree to participate in this research by selecting one of the options below:

Yes, I agree to participate: _____

No, I do not agree to participate: _____

Appendix C

Debriefing Form, Study 1

Study Title: Coping with Pet Loss

What are we trying to learn in this research?

In this study, we are looking at the relationship between pet loss, how people cope or find meaning in the experience, and mental health (e.g., depression, emotional trauma, quality of life). Research on coping with pet loss has found that grief can last anywhere from six months to one year, and though the mourning process is different between losing an animal companion and a human companion, the reaction to the loss can be similar. However, many gaps remain in our understanding of pet loss and who is more vulnerable to negative mental health outcomes. Investigating vulnerability and resilience factors will further scientific knowledge in this area, and better support those grieving the loss of a pet. These supports can range from bereavement policies in the workplace to social support networks that aid with coping. What are our hypotheses and predictions? We predict that those who heavily rely on their pets for day to day support and functioning will experience stronger negative mental health outcomes, but that this relationship might be diminished in the presence of good social supports and the ability to find positive meaning in the loss.

Is there anything I can do if I found this experiment to be emotionally upsetting?

Reflecting on the loss of a pet can sometimes have an unexpected emotional impact. If you should feel upset, please feel free to contact the Distress Centre of Ottawa and Region at 613-2383311 (<http://www.dcottawa.on.ca>) or the Mental Health Crisis Line at: (613) 722-6914 (<http://www.crisisline.ca/>).

What if I have questions later?

If you have remaining concerns, questions, or comments about the experiment, please contact:

Veronica Zuccala (Graduate Researcher) Department of Neuroscience, Carleton University
Email: veronica.zuccala@carleton.ca

Dr. Kim Matheson Department of Neuroscience, Carleton University
Tel: 613 520-2600 ext. 2652; Email: kim.matheson@carleton.ca

This ethics protocol for this project has been cleared by Carleton University Research Ethics Board-B (Clearance #110592).

If you have any ethical concerns with the study, please contact Dr. Bernadette Campbell, Chair, Carleton University Research Ethics Board-B and the Carleton University Research Compliance Office (by phone 613-520-2600 ext. 4085 or by email ethics@carleton.ca).

Thank you for participating in this research!

Appendix D

Background Information

1. Gender: Female Male Transgender Gender non-Conforming Not listed (please specify) _____

2. What is your age?

3. Please select which criteria you meet for this study.?

A) Have lost a pet in the past 6 months and currently do not have another pet _____

B) Have lost a pet in the past 6 months and currently have another pet currently (from before or adopted since) _____

C) Currently have a pet and did not lose one in the past 2 years _____

D) Have not owned a pet in the past two years _____

For the remaining questions, if you lost more than one pet, please respond in relation to the pet that you felt the most grief following the loss. If you did not lose a pet, please skip to question 13.

4. What type of pet did you lose?

A) Dog _____

B) Cat _____

C) Other (please specify): _____

5. How long did you have this pet?

6. How old was the pet when you lost it?

7. How did you lose your pet?

A) Deceased _____

B) Disappeared, and you don't know what happened _____

C) You had to give it up, and no longer have access _____

D) It was a shared pet, and you no longer live with it _____

8. Did you have a role in deciding the outcome of this loss? (i.e., made the final decision to euthanize, or give up the pet)

Yes _____

No _____

Prefer not to say _____

9. Was your pet a certified working animal?

A) Service Animal _____

B) Therapy Animal _____

C) Emotional Support Pet _____

D) Other, please specify _____

E) No, not a certified working animal _____

10. Was this loss expected?

A) Yes _____

B) No _____

C) In some ways (for e.g., loss was impending, but didn't know when) _____

11. Did you have another pet at the time of the loss?

A) Yes, if so specify what kind of pet(s) _____

B) No _____

12. Did you get a new pet following the loss of your pet?

A) Yes _____

B) No _____

C) Prefer Not to Say _____

If YES, please specify how long you waited before getting a new pet

If YES, please specify the type of pet (dog, cat, other) _____

If YES, please specify if the breed/ species is the same as your previous pet

13. Had you experienced any other loss (due to death or relationship termination) within the past 6 months?

- A) Yes, another pet _____
- B) Yes, someone you were close to
- C) Yes, someone you knew, but were not especially close to
- D) No _____
- E) Prefer not to say _____

If yes, was this loss expected (yes or no?)

14. What is your current relationship status? Please select the one that best applies to you.

- A) Single, and not seeing anyone _____
- B) In a casual relationship _____
- C) In a serious relationship _____
- D) Married/Cohabiting _____
- E) Separated/Divorced _____
- F) Widowed _____
- G) Prefer not to say _____

15. Do you currently have any health related (i.e., medical) illnesses or physical conditions?

- A) Yes _____
- B) No _____
- C) Prefer Not to Say _____

If YES, please specify disorder/condition _____

16. In your opinion, how would you describe your physical health?

- A) Poor _____
- B) Fair _____
- C) Good _____
- D) Very Good _____
- E) Excellent _____

17. Do you currently have a diagnosed mental health condition (e.g. depression, anxiety, etc.)?

- A) Yes _____
- B) No _____

C) Prefer Not to Say _____

If YES, please specify disorder/condition _____

18. In your opinion, how would you describe your mental health?

A) Poor _____

B) Fair _____

C) Good _____

D) Very Good _____

E) Excellent _____

19. What is your estimate of your family's gross income per year? Please select the one that best applies to you.

A) under \$15,000 _____

B) \$15,000 - \$29,999 _____

C) \$30,000 - \$44,999 _____

D) \$45,000 - \$59,999 _____

E) \$60,000 - \$74,999 _____

F) \$75,000 - \$89,999 _____

G) \$90,000 - \$104,999 _____

H) \$105,000 or more _____

I) prefer not to say _____

20. What is your employment status?

A) Employed Part-time _____

B) Employed Full-time _____

C) Unemployed _____

D) Retired _____

E) Other: _____

F) Prefer not to say _____

Appendix E

Pet Attachment Survey

For the following questions rate your response by clicking on the circle that best reflects how much you agree with the following statements in relation to your pet or the pet that you lost (if you have (lost) multiple pets, please answer in reference to the pet you felt closest to). If you have not owned a pet in the past 2 years, please skip this section.

	Strongly Agree (4)	Agree (3)	Disagree (2)	Strongly Disagree (1)
Within your family, your pet liked you best (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You were too busy to spend time with your pet (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You spent time each day playing with or exercising your pet (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your pet came to greet you when you arrived (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You talked to your pet as a friend (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your pet was aware of your different moods (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your pet paid attention and obeyed you quickly (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You confided in your pet (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You played with your pet when he/she approached (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

You spent time each day training your pet (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You showed photos of your pet to your friends (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You spent time each day grooming your pet (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You ignored your pet when he/ she approaches (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When you came home, your pet was the first one to greet you (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your pet tried to stay near by following you (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You bought presents for your pet (16)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When you felt bad, you sought your pet for comfort (17)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You preferred to be with your pet more than most people you know (18)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When your pet misbehaved you hit him/ her (19)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your pet was a nuisance and a bother to you (20)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You considered your pet to be a	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

member of your family (21)				
You liked to touch and stroke your pet (22)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You felt sad when you were separated from your pet (23)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You liked to have your pet sleep near your bed (24)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You liked to have your pet sleep on your bed (25)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You had your pet near you when you read, studied or watched TV (26)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You didn't like your pet to get too close to you (27)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Source: Holcomb, R., Williams, R. C., & Richards, P. S. (1985). The elements of attachment: Relationship maintenance and intimacy. *Journal of the Delta Society*.

Appendix F

Pet Bereavement Questionnaire

For the following questions rate your response by clicking on the circle that best reflects how much you agree with the following statements based on how you have felt over the past 6 months following the loss of your pet (if you have not lost a pet in the past 6 months please skip this section).

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
I feel angry at the veterinarian for not being able to save my pet (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am very upset about my pet's death (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My life feels empty without my pet (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel lonely without my pet (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I should have known something bad could happen to my pet (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I miss my pet enormously (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel very guilty for not taking better care of my pet (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel bad that I didn't do more to save my pet (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I cry when I think about my pet (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am angry at other people for contributing to the death of my pet (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am very sad about the death of my pet (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am angry at my friends/ family for not being more helpful (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Memories of my pet's last moments haunt me (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'll never get over the loss of my pet (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I wish I had shown my pet more love (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Source: Hunt, M., & Padilla, Y. (2006). Development of the pet bereavement questionnaire. *Anthrozoös*, 19(4), 308-324.

Appendix G

Coping Strategies Scale

The purpose of this questionnaire is to find out how people cope with stressors. The following are activities you may have done following a stressful or traumatic event. After each activity, please indicate the extent to which you would agree with the following statements in relation to a recent stressful situation that you experienced in the past month.

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
Accept that there is nothing I can do to change the loss (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Blamed myself for the loss (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Told others I was really upset about the loss (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Asked others for help or advice (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spent a lot of times thinking about the loss (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Took time for recreation or pleasure activities (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Made plans to overcome my feelings about the loss (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avoided thinking about the loss (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Told jokes about the loss (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Thought a lot about who was responsible for the loss (besides me) (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worried about the loss a lot (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Made humorous comments or stories about the loss (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wished the feelings would just go away or be over with (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thought a lot about how I brought the loss on myself (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decided to wait and see how things turned out (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tried to keep my mind off things that were reminding me of the loss (16)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sought reassurance and emotional support from others (17)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thought about how the loss was caused by other people (18)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Cried, even if someone else was around (19)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Looked for how I could grow and learn from the loss (20)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Told myself that other people have experienced loss like mine (21)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Did things to keep busy or active (i.e. exercised or went out) (22)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Held in my feelings (23)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Daydreamed about how things may turn out (24)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tried to act as if I wasn't feeling bad (25)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Took steps to overcome the loss (26)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Turned to God or my faith (27)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Looked for Physical contact with my pet (28)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Turned to my pet for emotional comfort (29)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Took my pet for a
walk (30)



Appendix H

Social Perceptions Scale

For the following questions rate your response by clicking on the circle that best reflects how much you agree with the following statements in relation to your relationships with other people in your life.

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
There are people I can depend on to help me if I really need it. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is no one I can turn to for guidance in times of stress. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are people who enjoy the same social activities I do. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel personally responsible for the well-being of another person. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not think other people respect my skills and abilities. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If something went wrong, no one would come to my assistance. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have close relationships that provide me with a sense of emotional security and well-being. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I have relationships where my competence and skill are recognized. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is no one who shares my interests and concerns. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is no one who really relies on me for their well-being. (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a trustworthy person I could turn to for advice if I were having problems. (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel a strong emotional bond with at least one other person. (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Source: Cutrona, C. E., & Russell, D. W. (1987). The provisions of social relationships and adaptation to stress. *Advances in personal relationships*, 1(1), 37-67

Appendix I

Unsupportive Social Interaction Inventory

Answer the following questions regarding the support you received from others **in relation to a stressful event or trauma that has occurred in the past 6 months (if you have not experienced a stressful event or trauma, please answer in relation to how you feel the people around you would react if you sought out support)**. Please briefly describe the stressful event or trauma that you are referring to:

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
They would not seem to want to hear about it. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They would refuse to take me seriously. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They would change the subject before I wanted to. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They would refuse to provide the type of help or support I was asking for. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I was talking about it, the person wouldn't give me enough time, or would make me feel like I should hurry. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They would discourage me from expressing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

feelings such as anger, hurt or sadness. (6)

They would not seem to know what to say, or would seem afraid of saying or doing the “wrong” thing. (7)

They would seem to be telling me what he or she thought I wanted to hear. (8)

From voice tone, expression, or body language, I would get the feeling he or she was uncomfortable talking about it. (9)

They would try to cheer me up when I was not ready to. (10)

They would respond with uninvited physical touching (e.g., hugging). (11)

They would do things for me that I would want to do and could do myself. (12)

They would feel that I should stop

worrying about the event and just forget about it.

(13)

They would tell me to be strong, to keep my chin up, or that I should not let it bother me.

(14)

They would feel that I should focus on the present or the future and that I should forget about what has happened and get on with my life.

(15)

They would feel that it could have been worse or was not as bad as I thought. (16)

They would say that I should look on the bright side.

(17)

They would feel that I was overreacting. (18)

They would ask “why” questions about my role in the event. (19)

They would make “Should or shouldn’t have” comments about my role in the event. (20)

They would tell
me that I had
gotten myself into
the situation in the
first place, and
now must deal
with the
consequences.
(21)

They would blame
me, or try to make
me feel
responsible for the
event. (22)

They would make
“I told you so” or
similar comments.
(23)

They would seem
to be disappointed
in me. (24)

Source: Ingram, K. M., Betz, N. E., Mindes, E. J., Schmitt, M. M., & Smith, N. G. (2001). Unsupportive responses from others concerning a stressful life event: Development of the Unsupportive Social Interactions Inventory. *Journal of Social and Clinical Psychology*, 20(2), 173-207.

Appendix J

Daily Hassles Scale

For each of the following hassles, please indicate whether you're experiencing this, and if so, the degree of severity using the following scale:

Strongly Disagree (1) Disagree (2) Agree (3) Strongly Agree (4)

Factor 1: Social and cultural difficulties

Gossip about someone you care about	1	2	3	4
Being let down or disappointed by friends	1	2	3	4
Having your trust betrayed by a friend	1	2	3	4
Conflict with friends(s)	1	2	3	4
Gossip about yourself	1	2	3	4
Decisions about intimate relationship(s)	1	2	3	4
Conflicts with family member(s)		1	2	3
Experiencing high levels of noise	1	2	3	4
Ethnic or racial conflict	1	2	3	4
Difficulty dealing with modern technology (e.g., computers)	1	2	3	4
Conflicts with in-laws or boyfriend's/girlfriend's family	1	2	3	4

Factor 2: Work Dissatisfaction with work

Disliking your work	1	2	3	4
Finding work uninteresting	1	2	3	4
Disliking your daily activities	1	2	3	4
Conflict with supervisor(s) at work	1	2	3	4
Lower evaluation of your work than you think you deserve	1	2	3	4
Lower evaluation of your work than you hoped for	1	2	3	4

Factor 3: Time pressure

Too many things to do at once	1	2	3	4
Not enough time to meet your obligations	1	2	3	4
A lot of responsibilities	1	2	3	4
Not enough leisure time	1	2	3	4
Finding your work too demanding	1	2	3	4

Hard work to look after and maintain home	1	2	3	4
Unwanted interruptions of your work	1	2	3	4
Struggling to meet your own standards of performance and accomplishment	1	2	3	4

Factor 4: Finances

Cash-flow difficulties	1	2	3	4
Financial burdens	1	2	3	4
Trying to secure loan(s)	1	2	3	4
Failing to get money you expected	1	2	3	4
Unsatisfactory housing conditions	1	2	3	4
Financial conflicts with family members	1	2	3	4

Factor 5: Social acceptability

Dissatisfaction with your physical fitness	1	2	3	4
Being ignored Social isolation	1	2	3	4
Dissatisfaction with your physical appearance	1	2	3	4
Social rejection	1	2	3	4

Factor 6: Social victimization

Being taken for granted	1	2	3	4
Being taken advantage of	1	2	3	4
Getting "ripped off" or cheated in the purchase of goods	1	2	3	4
Having your contributions overlooked	1	2	3	4

Kohn, P. M., & Macdonald, J. E. (1992). The Survey of Recent Life Experiences: A decontaminated hassles scale for adults. *Journal of behavioral medicine*, 15(2), 221-236.

Appendix K

Life Events Questionnaire

The purpose of this questionnaire is to identify significant experiences in one's life. The events listed below are far more common than many people realize. Please read each question carefully and indicate the answers that best describe your experience.

Please indicated whether you have had any of the following experiences:

- a) a serious shock (e.g., a car accident, experiencing a natural disaster such as an earthquake).
 yes no

If this happened:

Did you experience fear, helplessness, or horror when it happened?

- yes no

When did it happen?

Most recent: In the past year; 2-5 yrs ago; 6-10 yrs ago;
 10-15 yrs ago; when you were less than 5 years old

First time (if different from above): In the past year; 2-5 yrs ago;
 6-10 yrs ago; 10-15 yrs ago; when you were less than 5

- b) loss of a beloved pet yes no

If this happened:

Did you experience fear, helplessness, or horror at things that happened?

- yes no

When did this happen?

Most recent: In the past year; 2-5 yrs ago; 6-10 yrs ago;
 10-15 yrs ago; when you were less than 5 years old

First time (if different from above): In the past year; 2-5 yrs ago;
 6-10 yrs ago; 10-15 yrs ago; when you were less than 5

- c) the sudden or unexpected loss of a person that you loved due to death.
 yes no

If this happened:

Did you experience fear, helplessness, or horror when it happened?

- yes no

When did it happen?

Most recent: In the past year; 2-5 yrs ago; 6-10 yrs ago;
 10-15 yrs ago; when you were less than 5 years old

First time (if different from above): In the past year; 2-5 yrs ago;
 6-10 yrs ago; 10-15 yrs ago; when you were less than 5

- d) having to see something distressing happen to someone you cared about (e.g., suffering from a life-threatening illness, being injured). yes no

If this happened:

Did you experience fear, helplessness, or horror when it happened?

yes no

When did it happen?

Most recent: In the past year; 2-5 yrs ago; 6-10 yrs ago;
 10-15 yrs ago; when you were less than 5 years old

First time (if different from above): In the past year; 2-5 yrs ago;
 6-10 yrs ago; 10-15 yrs ago; when you were less than 5

- e) an experience of physical or sexual assault. yes no

If this happened:

Did you experience fear, helplessness, or horror when it happened?

yes no

When did it happen?

Most recent: In the past year; 2-5 yrs ago; 6-10 yrs ago;
 10-15 yrs ago; when you were less than 5 years old

First time (if different from above): In the past year; 2-5 yrs ago;
 6-10 yrs ago; 10-15 yrs ago; when you were less than 5

- f) an experience of discrimination due to race, gender or religion
 yes no

If this happened:

Did you experience fear, helplessness, or horror when it happened?

yes no

When did it happen?

Most recent: In the past year; 2-5 yrs ago; 6-10 yrs ago;
 10-15 yrs ago; when you were less than 5 years old

First time (if different from above): In the past year; 2-5 yrs ago;
 6-10 yrs ago; 10-15 yrs ago; when you were less than 5

If any of the events (listed above) happened to you, which one event CAUSES YOU THE MOST DISTRESS? Indicate letter: _____

How much distress (anxiety, worry, sadness, or grief) does this event cause you?

Appendix L

CES Depression Scale (10-item version)

For the following questions rate your response by clicking on the circle that best reflects how much you agree with the following statements based on how you have felt over the past month.

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
I was bothered by things that don't usually bother me. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had trouble keeping my mind on what I was doing. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt depressed. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt everything I did was an effort. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt hopeful about the future. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt fearful. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My sleep was restless. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was happy. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt lonely. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I could not "get going". (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Source: Andresen EM (1994) Screening for depression in well older adults: Evaluation of a short form of the CES-D. American Journal of Preventive Medicine 10(2): 77.

Appendix M

Health Questionnaire

The following is a list of illnesses and physical health problems that can occur for a short period of time (acute), or can repeatedly occur over a longer period of time (chronic). **Please indicate which ones you have experienced in the past 6 months. Highlight "YES" if you have experienced a problem and "NO" if you have not.**

Appendix N

Quality of Life Questionnaire

1. In general, how satisfied or dissatisfied are you with your physical health as it is right now?
- | | | | | | | | | | | | |
|-------------------------|---|---|---|---|---|---|---|---|---|----|----------------------|
| Completely Dissatisfied | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Completely Satisfied |
| | | | | | | | | | | | Neutral |
2. In general, how satisfied or dissatisfied are you with your work life as it is right now? Completely Dissatisfied 1 2 3 4 5 6 7 8 9 10 Completely Satisfied
Neutral
3. In general, how satisfied or dissatisfied are you with your social life as it is right now? Completely Dissatisfied 1 2 3 4 5 6 7 8 9 10 Completely Satisfied
Neutral
4. In general, how satisfied or dissatisfied are you with your home life as it is right now? Completely Dissatisfied 1 2 3 4 5 6 7 8 9 10 Completely Satisfied
Neutral
5. In general, how satisfied or dissatisfied are you with your emotional state as it is right now?
Completely Dissatisfied 1 2 3 4 5 6 7 8 9 10 Completely Satisfied
Neutral
6. In general, how satisfied or dissatisfied are you with your recreational life as it is right now?
Completely Dissatisfied 1 2 3 4 5 6 7 8 9 10 Completely Satisfied
Neutral
7. In general, how satisfied or dissatisfied are you with your life as a whole right now? Completely Dissatisfied 1 2 3 4 5 6 7 8 9 10 Completely Satisfied
Neutral

Source: Revicki, D. A., Turner, R., Brown, R., & Martindale, J. J. (1992). Reliability and validity of a health-related quality of life battery for evaluating outpatient antidepressant treatment. *Quality of Life Research*, 1(4), 257-266.

Appendix O

3-item Loneliness Scale

Please answer the following questions based on how you have felt over the past 6 months.

Hardly Ever (1) Some of the Time (2) Often (3)

**How often do you feel
you lack
companionship? (1)**

**How often do you feel
left out? (2)**

**How often do you feel
isolated from others?
(3)**

Source: Hughes, M. E., Waite, L. J., Hawkley, L. C., & Cacioppo, J. T. (2004). A Short Scale for Measuring Loneliness in Large Surveys: Results From Two Population-Based Studies. *Research on Aging*, 26(6), 655–672.

Appendix P

Impact of Events

The following is a list of difficulties people sometimes have after a stressful experience. **If you experienced the loss of a pet in the past 6 months, please respond to the following questions with that loss in mind.**

If not, please think about the event that you considered the most distressing from the list of possible life experiences you just completed.

Please read each item and then indicate how distressing each difficulty has been for you during the past month as a result of, or any time you thought of this event. How much do you continue to be distressed or bothered with these difficulties?

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
Any reminder brought back feelings (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had trouble staying asleep (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other things kept making me think about it (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt irritable and angry (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I avoided letting myself get upset when I thought about it or was reminded of it (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I thought about it when I didn't mean to (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt as if it hadn't happened or wasn't real (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I stayed away from reminders about it (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pictures about it popped into my mind (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was jumpy and easily startled (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tried not to think about it (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was aware that I still had a lot of feelings about it but I didn't deal with them (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My feelings about it were numb (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found myself acting or feeling like I was back at this time (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had trouble falling asleep (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had waves of strong feelings about it (16)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tried to remove it from my memory (17)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had trouble concentrating (18)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reminders of it caused me to have physical reactions such as sweating, trouble breathing, nausea or a	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

pounding heart
(19)

I had dreams
about it (20)

I felt watchful and
on guard (21)

I tried not to talk
about it (22)

Appendix Q

Post-Traumatic Growth Inventory

The following is a list of difficulties people sometimes have after a stressful experience. **If you experienced the loss of a pet in the past 6 months, please respond to the following questions with that loss in mind.**

If not, please think about the event that you considered the most distressing from the list of possible life experiences you just completed.

Please read each item and then indicate how distressing each difficulty has been for you during the past month as a result of, or any time you thought of this event. How much do you continue to be distressed or bothered with these difficulties?

I did not experience this change (1)	I experienced this change to a very small degree (2)	I experienced this change to a small degree (3)	I experienced this change to a moderate degree (4)	I experienced this change to a great degree (5)	I experienced this change to a very great degree (6)
I changed my priorities about what is important in life (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a greater appreciation for the value of my own life (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I developed new interests (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have greater feelings of self-reliance (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a better understanding of spiritual matters (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I more clearly see that I can count on people in times of trouble (6)	<input type="radio"/>				
I established a new path for my life (7)	<input type="radio"/>				
I have a greater sense of closeness with others (8)	<input type="radio"/>				
I am more willing to express my emotions (9)	<input type="radio"/>				
I know better that I can handle difficulties (10)	<input type="radio"/>				
I am able to do better things with my life (11)	<input type="radio"/>				
I am better able to accept the way things workout (12)	<input type="radio"/>				
I can better appreciate each day (13)	<input type="radio"/>				
New opportunities are available which wouldn't have been	<input type="radio"/>				

otherwise

(14)

I have more compassion for others
(15)

I put more effort into my relationships
(16)

I am more likely to try to change things that need changing (17)

I have stronger religious faith
(18)

I discovered I am stronger than I thought I was (19)

I learned a great deal about how wonderful people are
(20)

I better accept needing others (21)

Appendix R

Open-Ended Questions

If you do not have a pet, or have not lost a pet in the past 6 months please skip this section.

1. Think of the pet you were closest to, or that you recently lost. Please describe what your pet meant to you.

2. If you have ever lost a pet, please describe (emotionally, behaviourally) what it was like going forward following the loss.

Appendix S

Informed Consent, Study 2

Differences in Stress Response between Pet Owners, Non-Pet Owners and those experiencing Pet Loss

The lead researcher for this study is Veronica Zuccala in the Department of Neuroscience at Carleton University. She is working under the supervision of Dr. Kim Matheson in the Department of Neuroscience at Carleton University.

Purpose: In this study, we are looking at differences in stress response between pet owners, non-pet owners and those who have lost a pet in the past 6 months. We are hoping to identify what factors might contribute to how attached people become to their pets, and for those who lose their pet how they grieve or grow from the loss. Some of the factors we are looking at include social support, coping strategies, daily hassles, and whether a person has experienced previous trauma (e.g., previous physical or sexual assault or the death of a loved one). Many gaps remain in our understanding of companion pets and their implications for human mental and physical health, as well as the consequences of pet loss. Our results will contribute to scientific knowledge in this area, and may even play a role in policies associated with pet ownership and loss (e.g., in the workplace).

Eligibility criteria:

To participate in this study, you must be:

- 18+ years old
- Able to speak and understand English
- Meet ONE of the following criteria:
 - 1a) Currently have a pet and did not lose a pet in the past two years
 - 1b) Have not owned a pet for the past 2 years
 - 2a) Have lost a pet in the past 6 months and do not currently have a pet
 - 2b) Have lost a pet in the past 6 months and have another pet currently (from before or adopted since)

What are we asking you to do?

In Phase I participants will complete questionnaires and answer questions online (via Qualtrics) on topics including background information, pet attachment, health, social support, unsupportive social interactions, life stressors and hassles, depressive symptoms, impact of events, pet bereavement, loneliness, coping strategies, posttraumatic growth and open ended questions regarding the loss of a pet. Please note that some questions may require reflection on sensitive topics including the impact of child sexual assault on mental health. This survey should take approximately 25-30 minutes to complete.

Questionnaires will be validated to ensure that participants are 1) within Canada, 2) are not randomly responding to questions, and 3) to prevent bots/fraudsters from participating. Upon validation, participants will receive \$3.00 compensation.

Potential risks or causes of discomfort for participants

Warning that this study asks about recent and early life events that might have been experienced as traumatic (i.e. loss, physical or sexual assault, observation of something distressing), this may cause psychological or social discomfort. You may skip over any questions that you wish and there will be contacts available following the study in the event that you wish to seek support for your well-being.

Anonymity and confidentiality

All responses will be kept anonymous and confidential. Your responses may be used in future presentations or publications on the research topic; any reports on the data will use average responses, although quotes might be taken from any open-ended responses you provide.

The sole exception is in the case we learn a participant may cause harm to themselves or others. If you choose to participate in Phase II, all information and data collected from you for this study will be identified with a code number, as opposed to any personal identifiers such as your name or address. We will maintain a separate record that matches your personal identification details with this code number. This is necessary in order for us to match your responses from Phase I and Phase II. If you do not wish to participate in Phase II, all data will be anonymous and non-attributable.

IP addresses will be linked to survey responses for the sole purpose of ensuring participants are located within Canada. Participant data and IP addresses are confidential. We will remove IP addresses as soon as a Canadian location is confirmed after which all information and stored research data from you will be anonymous. Once participants complete the study, the survey will place a cookie on their browser to indicate previous participation. Your data will be stored and protected by Qualtrics, in a server located in Canada, but may be disclosed via a court order or data breach.

Once the project is completed, all research data will be kept for five years and potentially used for other research projects on this same topic. At the end of ten years, all research data will be securely destroyed. Electronic data will be erased and hard copies will be shredded.

Right to withdraw from this study

Participation in this study is entirely voluntary. At any point during the study you have the right to not complete certain questions or to withdraw. Regardless of your choice to withdraw or to skip any questions, you will still receive \$3.00 compensation for Phase I (upon validation). Please note that only those that complete Phase I will be eligible for participation in Phase II. Thus, if withdrawal occurs during Phase I, participants will receive only Phase I compensation (upon validation). Furthermore, if at a later date, you wish to withdraw from the study, you can contact the researchers up until data analysis begins on January 1st, 2020, and we will destroy all of your records from this study. Once data analysis begins, you will no longer be able to withdraw from the study. If you wish to withdraw from the study, please do so by clicking "I wish to withdraw from this study" at the bottom of the webpage; doing so will take you to the

debriefing page. It is also important to understand that questionnaires will be validated to ensure that participants are 1) within Canada, 2) are not randomly responding to questions, and 3) to prevent bots/fraudsters from participating. Upon validation, participants will receive \$3.00 compensation.

The research has been cleared by Carleton University Research Ethics Board-B (CUREB-B Clearance # 111490).

Should you have any ethical concerns with the study, please contact the REB Chair, Carleton University Research Ethics Board-B (by phone: 613-520-2600 ext. 4085 or by email: ethics@carleton.ca). For all other questions about the study, please contact the researcher.

Researcher contact information:

Veronica Zuccala (Graduate Researcher) Department of Neuroscience, Carleton University
Email: veronica.zuccala@carleton.ca

Dr. Kim Matheson Department of Neuroscience, Carleton University
Tel: 613 520-2600, ext. 2652; Email: kim.matheson@carleton.ca

Please indicate whether you agree to participate in this research by selecting one of the options below:

Yes, I agree to participate: _____

No, I do not agree to participate: _____

Appendix T

Debriefing Form, Study 2

Differences in Stress Response between Pet Owners, Non-Pet Owners and those experiencing Pet Loss

What are we trying to learn in this research?

In this study, we are looking at differences between people who do or do not own a pet and the relationship between attachment and the outcome of either psychological growth or psychosocial grief following the loss of a companion animal, and what conditions allow for each of these outcomes. Research on coping with pet loss has found that grief can last anywhere from six months to one year, and though the mourning process is different between losing an animal companion and a human companion, the reaction to the loss can be similar. However, many gaps remain in our understanding of pet loss and who is more vulnerable to negative mental health outcomes. Investigating conditions that influence psychological growth versus psychological grief will further scientific knowledge in this area, and better support those grieving the loss of a pet. These supports can range from workplace policies to social support networks that aid with coping.

What are our hypotheses and predictions?

We predict that those who have a stronger attachment to their pet will experience stronger psychological grief following the loss, but that strong attachment can result in psychological growth in the presence of particular conditions including social supports and coping strategies.

Is there anything I can do if I found this experiment to be emotionally upsetting?

Reflecting on the loss of a pet or other traumatic experiences can sometimes have an unexpected emotional impact. If you should feel upset, please feel free to contact the Carleton University Health and Counseling Services at: 613-520-6674, [Canada Suicide Prevention Service \(CSPS\)](#), by Crisis Services Canada (French and English) toll-free 1-833-456-4566 (Available 24/7) or the Mental Health Crisis Line at: (613) 722-6914 (<http://www.crisisline.ca/>).

What if I have questions later?

If you have any remaining concerns, questions, or comments about the experiment, please contact:

Veronica Zuccala (Graduate Researcher) Department of Neuroscience, Carleton University
Email: veronica.zuccala@carleton.ca

Dr. Kim Matheson Department of Neuroscience, Carleton University
Tel: 613 520-2600 ext. 2652; Email: kim.matheson@carleton.ca

This ethics protocol for this project has been cleared by Carleton University Research Ethics Board-B (CUREB-B Clearance # 111490).

Should you have any ethical concerns with the study, please contact the REB Chair, Carleton University Research Ethics Board-B (by phone: 613-520-2600 ext. 4085 or by email: ethics@carleton.ca). For all other questions about the study, please contact the researcher.

Thank you for participating in this research!

Appendix U

TCPS2 Certificates





Certificate of Completion

This document certifies that

Sarah MacDonald

*has completed the Tri-Council Policy Statement:
Ethical Conduct for Research Involving Humans
Course on Research Ethics (TCPS 2: CORE)*

Date of Issue: **28 August, 2019**



Certificate of Completion

This document certifies that

Juliana Nicoletta

*has completed the Tri-Council Policy Statement:
Ethical Conduct for Research Involving Humans
Course on Research Ethics (TCPS 2: CORE)*

Date of Issue: 10 September, 2019



Certificate of Completion

This document certifies that

Jyllenna Wilke

*has completed the Tri-Council Policy Statement:
Ethical Conduct for Research Involving Humans
Course on Research Ethics (TCPS 2: CORE)*

Date of Issue:

10 September, 2019



Certificate of Completion

This document certifies that

Maria Pranschke

*has completed the Tri-Council Policy Statement:
Ethical Conduct for Research Involving Humans
Course on Research Ethics (TCPS 2: CORE)*

Date of Issue: **11 August, 2019**



Certificate of Completion

This document certifies that

Samantha Ricardo

*has completed the Tri-Council Policy Statement:
Ethical Conduct for Research Involving Humans
Course on Research Ethics (TCPS 2: CORE)*

Date of Issue: **27 November, 2017**