

The effects of dog-owning on students' levels of stress and loneliness

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2020

Bachelor of Arts (Hons) Psychology

Submission of Thesis and Dissertation

National College of Ireland

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Acknowledgements

Firstly, I would like to thank my thesis supervisor, Dr Michelle Kelly, for all her help, support and patience over the last 6 months, my classmates for the support and encouragement and of course my participants for taking time to participate, offering their information and for making this study possible.

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Abstract

The effects of dog-owning on students' levels of stress and loneliness was tested using a two way between-groups ANOVA and Mann-Whitney U test. A two-way between-groups ANOVA was conducted to discover the impact of dog-owning on stress and gender. Data for the loneliness variable were not normally distributed, a Mann-Whitney U test was conducted to discover the influence of gender and dog-owning on loneliness. The current study aimed to find interactions between dog-owning and stress, dog-owning and loneliness and to which gender is there a greater influence. One hundred and forty-two participants were recruited through convenient sampling by an online survey posted to popular social media sites. Participants age ranged between 18-27, one hundred and nine females and thirty-two males. Results conclude that there was a significant difference between males and females on the outcome of stress but there was no difference between dog-owning and non-dog-owning. There was also no interaction between gender and dog-owning. There were also no statistically significant results found on the impact of dog-owning on the loneliness levels of the student population. Implications include a small sample size and for future studies a larger sample size including a more vulnerable population would be recommended.

Keywords: dog-owning, students, stress, loneliness, gender

The effects of dog-owning on students' levels of stress and loneliness

In the beginning, animals provided basic human needs such as clothes and food (Levinson, 1969), over time this has evolved into much more. Due to cultural evolution, humans and animals have grown to form companionships and humans now often rely on animals for numerous physical, emotional and mental benefits that come with owning a pet (Brodie & Biley, 1999). Research thus far on the effects of pets on human life has shown consistent benefits, with the majority of studies focused on the positive effects of owning a

dog, for example, Knight and Edwards (2008) highlight the importance of dog owning on both an elderly and a younger adult population in terms of companionship and exercise. They also state that these are symbiotic relationships; we impact the life of our dogs equally as much as they impact ours. There are numerous benefits to dog owning including companionship, entertainment and meaningful interactions (Blouin, 2013), but of these, the positive impact of dog owning on physical, social and emotional outcomes are most commonly considered.

Physical Benefits

Here we will explore a number of physical benefits to dog-owning. Serpell (1991) discovered that there was a decrease in minor health problems in the lives of people after they got a pet, including improvements in human health and behaviour as participants with dogs engaged in considerably more physical exercise whilst walking their dog than other groups in the experiment. A subsequent study conducted in Australia found that males who owned a pet had lower systolic blood pressure, triglyceride and cholesterol levels than males who did not own a pet. Females (over 40) also had lower systolic blood pressure and triglyceride levels than women who did not own a pet (Anderson et al., 1992). More recent research also supports the above findings related to dog-owning and physical health benefits. Hoerster et al. (2011) found that dog walking is associated with meeting physical health guidelines and should be promoted and encouraged. Although, in light of increasing levels of obesity and decreasing levels of physical activity in Western countries, Fox (2007) found that obesity and physical inactivity are highly correlated, and physical activity is also associated with well-being and quality of life. Further research is required to determine how dog ownership and physical activity is can contribute to different types of health interventions. Dog owning may encourage exercise by providing access to social support from other dog-walkers (Cutt,

Giles-Corti, Knuiaman, & Burke, 2007) or through motivation to care for the dog. Hoerster et al. (2011) found that dog-walking obligation and dog encouragement were the strongest correlations within their study. Dog-walking obligation provides the owner with a sense of purpose thus increasing levels of motivation to engage in physical activity. This study was carried out with a convenient sample, perhaps a change in sample population and sample size would help generalize these findings more. There was a large amount of missing data and no statistically significant correlations. Further research is required however, as there were methodological issues with the above studies (e.g. convenience samples and missing data) that limit the generalisability of the results. Another important point to consider is that physical benefits might also confer positive physiological and psychological effects. Research has been conducted to show the positive effects of exercise on stress levels (Everly & Lating, 2019). If dog-owning encourages physical activity therefore, it may also alleviate stress.

Dog-Owning and Stress

Research shows that dog-owning can impact stress in a number of ways. For example, owning a pet can reduce tensions between family members thus lowering stressors and improving quality of family life (Barker, 1993; Voith, 1985). This is consistent with the work of a more recent study (Kurdek, 2008) that also found that dogs in particular alleviate stress and provide unconditional love and company. Dog owning can even relieve safety-related stressors; Serpell (1990) found that dog owners were less worried about being affected by crime, resulting in higher levels of security and safety. Similarly, dogs have been utilised in multiple areas such as combat, protection, AAT, hunting, and rehabilitation and have proven beneficial in all these areas. Marr et al. (2000) found that psychiatric patients who participated in AAT were more socially interactive with other patients after the therapy. They

also scored higher on measures of smiles and pleasure. Veterans, in some cases, work very closely with dogs in the army and form connections with them, in this study they have reported that dog-owning has influenced the emotional burden, physical condition and social isolation, it has also enhanced their companionship, physical activity, stress reduction and responsibility (Krueger, Stern & Anstead, 2014). However, this study was carried out on a population of veterans with HIV/AIDS and could potentially not be generalised. Similarly, not all studies show consistent findings. Sundman et al. (2019) found that dogs mirror the stress levels of their owners, the higher the stress levels of the owners the more stressed the dog will become, this kind of synchronisation happens over time due to daily interaction with the dog and the owner, however, a limitation of this study was due to seasonal effect on mood on stress levels. This suggests stress levels can be influenced by the changing seasons.

Stress can happen due to increased workloads, change in environment, social activities, change in eating and sleeping habits and change in peer groups, all of which are inevitable among college students (Wade, 2017). Similarly, other sources of stress include financial, inter-personal, social and family related, and even academic stress (Pitt, Opreescu, Tapia & Grey, 2018). Ward-Griffin et al. (2018) conducted a study using a student population to investigate the effect of dog-therapy on the students' well-being. The results of this study showed a significant decrease in stress levels and an increase in levels of happiness. However, the nature of this study could not distinguish the primary contributor of these results; although it is probable that it was the dog in this case. Although it has been suggested that compared to males, females have lower stress levels in the presence of a dog than they would have in the presence of a friend (Allen et al., 1991); the above study also saw no gender differences in stress outcomes (Ward-Griffin et al., 2018). These findings are consistent with that of Delgado, Toukonen and Wheeler (2018) who found that the use of canine therapy caused a decrease in stress levels among college students. It should be taken

into consideration that this sample was a convenient sample and self-selection of those that were biased towards positive animal interactions. Future studies replicate this study with a different type of sample and exclude self-selection to avoid bias results.

Students have a unique set of stressors and different stress levels to other populations (Pitt, Oprescu, Tapia & Grey, 2018) and are also a high-risk group for negative stress-related outcomes, in particular students with learning disabilities (Bender, Rosenkrans & Crane, 1999). Students stressors typically include academic stress, social stress, financial stress and emotional stress (Pariat, Rynjah, Joplin & Kharjana, 2014). In addition, studies examining the impact of dog owning on stress tends to focus on younger and older adults or those with disabilities. For these reasons, further research is required to determine the effects of dog-owning on the unique stressors of young adults in college.

Psychological Benefits

As well as stress, studies have also examined the effects of owning a dog on numerous psychological outcomes. Studies conducted by both Poresky and Hendrix (1990), and Van Houtte and Jarvis (1995) have found that children growing up with pets score higher on measures of empathy, self-esteem and self-concept than children who haven't grown up with pets. Animal-assisted therapy (AAT) has been around for decades and has proven to be most beneficial in areas regarding self-confidence and ego strength using horses. Some sexual abuse survivors have reported that the role of a pet has been the only constant thing in their lives (Barker et al, 1997). Owning a pet has also shown to have decreasing effects on levels of depression and anxiety (Jennings, 1997). Pets can also be used to influence perceptions of people. A study by Wells and Perrine (2001) found that pets positively influenced the students' impressions of their tutors by having a cat or dog in their office. However, other animals used may have elicited different responses and only single-item

measures were used. According to this research, it is evident that animals can benefit us psychologically; this then affects us socially and emotionally, from influencing our perceptions of others to influencing our perceptions of ourselves.

Emotional/Social Benefits

In previous studies animals have had a positive effect on trust, independence, patience and self-control (Erickson, 1963). Evans-Wilday et al (2018) found that dog-owners are more likely to confide in their dogs regarding emotional topics such as depression, jealousy, apathy, anxiety, calmness and fear. This study is unique and the first of its kind to find that dog-owners are more likely to confide in their dog about emotional topics than a partner or peer. Rothschild, Moroney and Hitch (2019) focused on the psychological benefits of dogs within a psychiatric rehabilitation centre and found that owning a dog filled the gap of loneliness and provided affection and companionship to the patients. This allowed them to build skills for future complex relationships. This is also significant as research has shown that there is a lack of opportunities for affection for those with mental health problems causing them to exhibit higher feelings of loneliness. This study is consistent with previous research carried out on the effects of dogs on loneliness.

Loneliness

Loneliness can cause some individuals to seek out attachments to decrease the lonely feeling (Krause-Parello, 2012). A number of studies have looked at the effects of pet owning on older adults in care facilities (Banks & Banks, 2005; Vrbanac et al, 2013; Krause-Parello, 2012), each study concluded loneliness levels are decreased in older adults when in the presence of an animal. A study focusing on a population of single women living alone found that owning a pet (cat/dog) can diminish feelings of loneliness (Zasloff & Kidd, 1994).

Similarly in a more recent study, Pikhartova, Bowling & Victor (2014) found that women who own a pet report significantly less feelings of loneliness than women who don't own a pet, also taking into consideration demographics such as gender, household income, household living status and health status. However, this has minimal application, if any at all, to a male population (Pikhartova et al, 2014).

Barker and Barker (1988; 1990) reported that dog owners consider their pets as a member of the family and that in 1/3 of the cases, the dog owners consider themselves closer with their dogs than some members of the family. This shows how important a dog may be to alleviate feelings of loneliness, perhaps in the absence of other family members. Loneliness is a common emotion among students, in particular students who have moved abroad or moved away from home to study (Jiang, Li, & Shypenka, 2018). For example, 5.3% of students living in china to study were severely distressed by feelings of loneliness which required professional help (Jiang et al., 2018). However, this study is focused on a specific sample of students living in china to study; perhaps other contributing variables, such as the volume of people living in china, could make it difficult to generalize these results to all students living abroad. Perhaps an intervention such as owning a pet to provide companionship could be implemented to help decrease levels of loneliness of students living abroad. Students' decreased levels of loneliness could potentially help to improve their overall psychological adjustment; and greater well-being paired with possible increased exercise engagement may also decrease levels of academic stress.

The Current Study

A review of the above literature shows that dog owning may confer physical and psychological benefits that may lower stress levels and might also influence socio-emotional outcomes which could impact loneliness. The majority of the extant research focuses on

children and older adults or people with a disability. This research aims to extend the current literature by examining the effects of dog owning on the self-reported stress and loneliness of college students. This is of particular importance and college students are particularly vulnerable to negative effects of stress and loneliness. Stress affects students physically, psychologically and cognitively (Shankar & Park, 2016). Physical effects may include excessive drinking, emotional eating and increased sweet food consumption. Stress can also affect students' attention and concentration; it can also have a negative effect on mental health. Similarly, stress can influence binge eating resulting in rapid weight gain (Sulkowski, Dempsey & Dempsey, 2011). This research aims to examine the effect of dog-owning on students' levels of stress (research question 1). Loneliness can affect students' interest in exploring new surroundings and can also reduce their cognitive ability, in particular, emotion recognition (Quan, Zhen, Yao & Zhou, 2014). Another aim of this research is to examine the effects of dog-owning on students' levels of loneliness (research question 2). Based on previous literature, the use of animal interventions could help decrease the stress and loneliness levels of students studying at home and especially students studying abroad, particularly in females. This study also aims to see if there is an interaction between dog-owning, stress and loneliness with gender (research question 3).

Method

Participants

The survey was posted online for students to fill out so their data could be included in the study. A power calculator (Rosner, 2011) was used to estimate a sample size based on the standard deviations and mean scores of previous literatures. Using the mean scores and standard deviation of loneliness of students (Jia, Wang, Yang, Yang, 2018) the sample size we generated from the power calculator is 110. 142 participants participated in this study.

Participants were recruited via convenient sampling. Participants were divided into two groups, students aged 18-27 (SD = 1.940), who own a dog (N=113) and students who don't own a dog (N=28). 77.3% (N=109) of participants were female, 22.7% (N=32) of participants were male. Students were predominantly located in north and south Dublin and from a college population, only 1.4% (N=2) of participants study abroad.

Materials/Measures

The perceived stress-scale. To measure levels of stress for both groups (with/without a dog) we used a perceived stress scale (Cohen, Kamarck, & Mermelstein, 1994). This scale includes a Likert scale of 0-4, the participants will answer 10 questions based on their stress levels over the last month. 0 being never, 1 being almost never, 2 being sometimes, 4 being fairly-often and 5 being always. Questions 1, 2, 3, 6, 11, 12, 13, 14 are considered negative and questions 4, 5, 7, 8 are considered positive. Results are obtained by reversing scores for the positive questions (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 & 4 = 0) and adding the scores. The answers will indicate the participants level of stress over the last month namely how unpredictable, uncontrollable and overloaded they find their lives. Maximum possible score is 40, lowest possible score is 0. Higher scores indicate higher levels of stress. Perceived stress scale has been reported to have a high level of reliability and validity, Cronbach's Alpha value of $>.70$ (Lee, 2012).

The UCLA loneliness scale. To measure the effects of dog-owning on levels of loneliness we used the UCLA loneliness scale. This is a 20-item scale used to measure one's subjective feelings of loneliness as well as social isolation. (Russell, Peplau, Ferguson, 1987). Participants rate their feelings as either O (I often feel this way), S (I sometimes feel this way), R (I rarely feel this way), N (I never feel this way). When revising the data, make all O's equal 3, S's equal 2, R's equal 1 and N's equal 0. Scoring is to be kept continuous. When

added, the higher the scores, the higher the levels of loneliness and social isolation within the participant. Results for the UCLA loneliness scale indicated that the measure was highly reliable, in terms of internal consistency (coefficient ranging from .89 to .94) and test-retest reliability over a year period ($r = .73$) (Russell, 1996). Higher scores indicate higher levels of loneliness. Maximum score is 60 and minimum score is 0.

Design

The design of this study is cross-sectional, between-groups design using naturally occurring groups. We examined the stress and loneliness levels between a group of people who own dogs and a group of people who don't. The independent variable in this study is the groups that do/do not own a dog, the dependent variable being their levels of stress and loneliness. We examined the effects of dog-owning on these two variables, stress and loneliness, and if the effect did occur, which gender did it influence the most.

Procedures

The data used in this study was collected using an online survey. The survey link was posted online on all my social media accounts (Instagram and Facebook), and was free of charge for students to complete. The survey opened with a participant information sheet complete with a detailed account on what the study entails, what we wish to achieve in our results, and time frame. Both the perceived stress scale (Cohen, Kamarck, & Mermelstein, 1994) and the UCLA loneliness scale (Russell, Peplau & Ferguson, 1978) were presented in the survey to be answered. Participants were also be asked in the survey whether they own a dog, they answered some questions regarding the dog such as how long they have owned it, do they live with it, are they the primary caregiver. Participants were also asked to indicate their gender and if they study abroad. The study could be completed within the participants

own time, therefore breaks given by myself will not be necessary, if the participant wished to stop at any time, they were free to do so, the participant will also remain completely anonymous. There was no name, address or any other form of identification attached to the survey form. All that is required of the participants who wish to fill out the online survey is that they are a student and their gender. The survey link was posted online and will remained online for 2 weeks to allow enough participants to fill out the survey and submit their results. To allow enough time for participants to submit their surveys, after we have collected the surveys, the survey link will be removed from online and we will begin to sort through the data.

Ethics

This study was approved by the NCI ethics board, following NCI ethics policy. There is no use of a vulnerable population in this study. Participants were aware that by completing the survey, they consent to using their data in the study. Participants are informed upon completing the study that their data is anonymous and cannot be retracted once submitted. Before the survey is completed, is a participant information sheet available and post-survey there is a debrief sheet. An email address and phone number are also available to participants for any queries or questions related to the study.

Results

Descriptive statistics

Table 1

Frequencies for the current sample for categorical variables (N=141)

Variable	Frequency	Valid Percentage
Gender		
Male	32	22.7

Female	109	77.3
Do you own a dog?		
Yes	113	80.1
No	28	19.9
Do you study abroad?		
Yes	2	1.4
No	139	98.6
Year of degree		
Other	14	9.9
1st year	37	26.2
2 nd year	40	28.4
3 rd year	50	35.5
How long have you owned the dog?		
0-2 years	26	21.7
3-5 years	17	14.2
5-7 years	16	13.3
7+ years	61	50.8
Does the dog live with you?		
Yes	108	86.4
No	17	13.6
Are you the primary caregiver of the dog?		
Yes	35	28.5
No	88	71.5

Table 2

Descriptive statistics and reliability of all continuous variables

	Mean	SD	Min	Max
Age	21.13	1.94	17	27
Stress	23.00	5.86	8.00	39.00
Male	20.75	7.50	8.00	39.00
Female	23.66	5.14	8.00	36.00
Loneliness	22.19	15.4	.00	58.00
Male	22.44	15.94	.00	57.00
Female	22.12	15.27	.00	58.00

A preliminary analysis found a violation of the assumption of the homogeneity of variance for stress with gender but not dog-owning, but no violation of the assumption of normality. As the data were normally distributed and unequal variances were only observed for gender, it was decided that an ANOVA was appropriate. A two way between groups ANOVA was conducted to explore the impact of dog-owning and gender on stress. Participants were divided into two groups according to their gender (Male N = 32, Female N = 109) and whether or not they owned a dog (did not own a dog N = 28, did own a dog N = 113). There was a statistically significant main effect for gender, $F(1, 141) = 4.777, p = .031$. The interaction effect between gender and dog-owning on the outcome of stress was not significant, $F(1, 141) = .370, p = .544$, and there was no significant main effect for dog-owning $F(1, 141) = .335, p = .564$. See Figure 1.

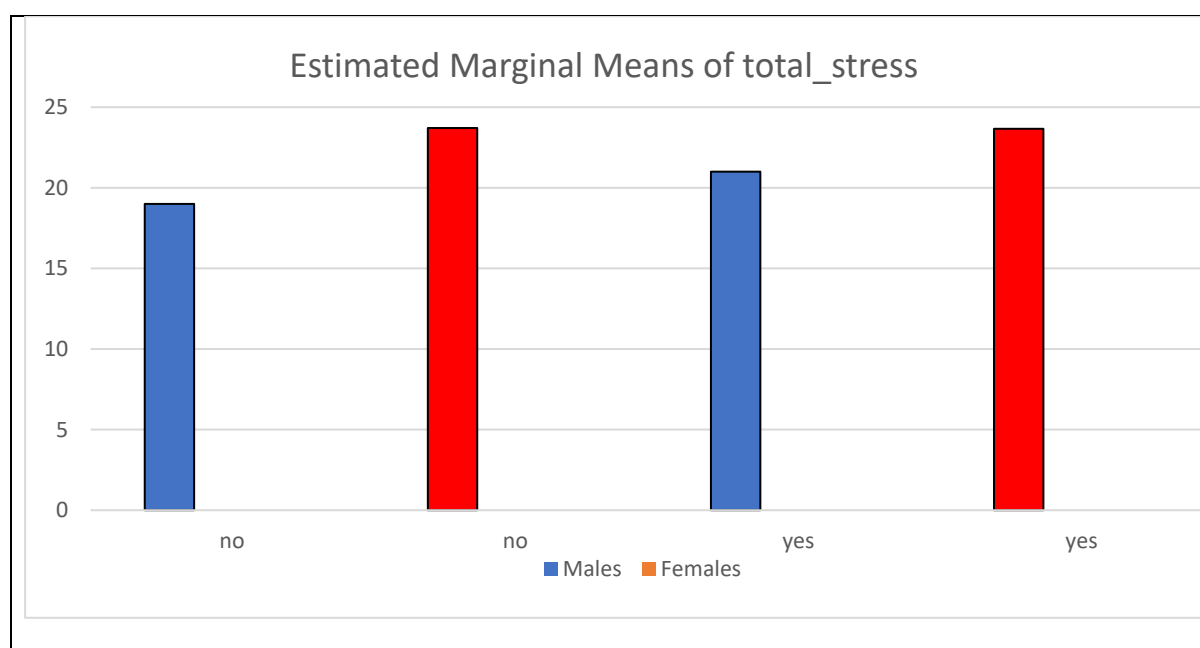


Figure 1 - Do you own a dog?

Figure 1 shows the mean scores on the outcome of stress for males and females that do (yes) own a dog and that don't (no) own a dog.

A preliminary analysis found that the data for loneliness was not normally distributed and had unequal variances. Using a non-parametric version of an independent samples t-test

we investigated the influence of gender and dog-owning on participants levels of loneliness. A Mann-Whitney U test indicated that there are no differences in levels of loneliness between female dog owners versus non-dog owners ($U= 801.50, p= .241$); and similarly, there are no differences in levels of loneliness between male dog owners versus non-dog owners ($U = 41.00, p = .604$). Results indicated that overall, dog owning does not impact levels of loneliness in this student population ($U= 1230.50, p= .210$).

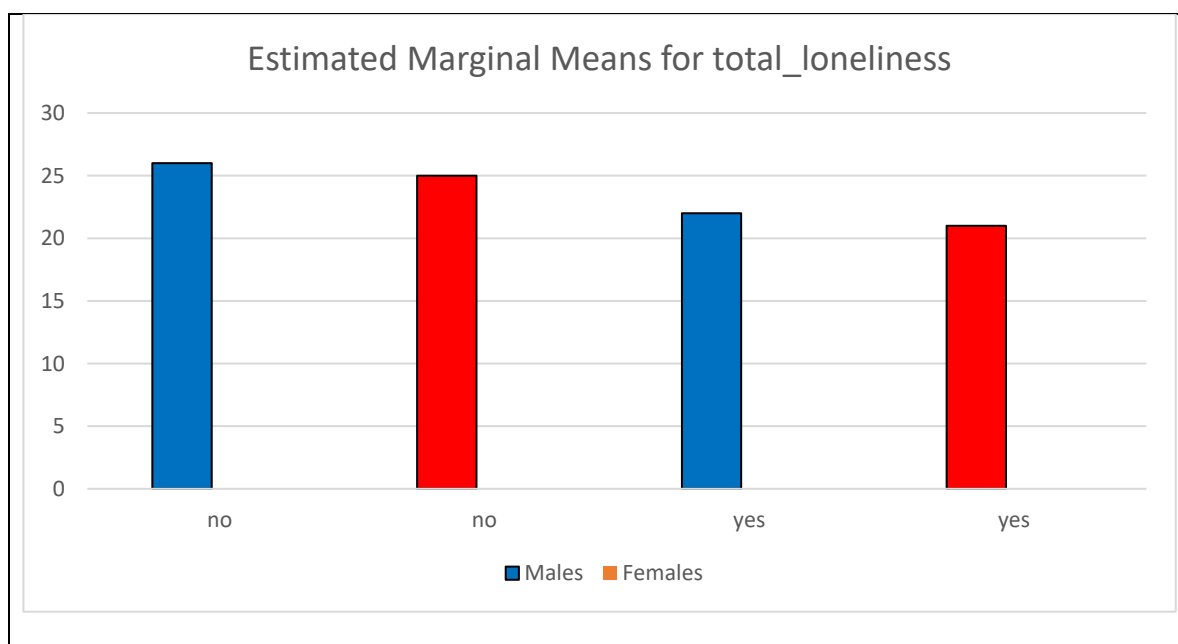


Figure 2 – Figure 2 shows the mean scores on the outcome of loneliness for males and females who do (yes) own and dog and don't (no) own a dog.

Discussion

The current study aimed to answer 3 questions. Firstly, does dog-owning effect students' levels of stress? Secondly, does dog-owning effect students' levels of loneliness? And thirdly if this effect does exist, which gender does it affect more? It was hypothesised that owning a dog will have a positive influence on students' levels of stress and loneliness and according to previous literature we hypothesised that female dog-owners will have lower levels of stress and loneliness.

In relation to the first research question, it was hypothesised that student dog-owners would have lower levels of stress, however, there was no interaction found between dog-owning and stress; this rejects the hypothesis proposed. Perhaps this is due to the fact that the current study did not suggest interaction with the dog before or after completing the survey. The study is based on the mere presence of the dog; however, results are consistent with that of Grossberg, Alf Jr, & Vormbrock (1988). Using a similar college population and experimental design, the study found no statistically significant difference in the stress levels of dog-present and dog-absent groups when problem solving. In contrast, other research suggests that the presence of a dog when completing a task did have significant effect on lowering stress levels (Barker et al, 2012), however, this study was completed using adults in a full-time job. These contradicting findings suggest that an older population for this type of study may produce more statistically significant results. Research shows that the top five stressors for college students are increased workloads, vacations, changed sleeping habits and sleeping habits and new responsibilities (Ross, Niebling & Heckert, 1999). Perhaps dog-owning is not enough to influence these levels of stress.

In relation to the second research question, it was hypothesised that student dog-owners would have a lower level of loneliness, however, no impact was found between dog-owning on the loneliness levels of this student population. The results of this study are consistent with a study conducted by Lee and Chai (2015). This study also used a student population and tested for the effects of dog-owning on stress and social support. The findings were also insignificant. Similarly, the sample sizes were not adequate in both studies to find a statistically significant difference. A bigger sample size is required for such results in both cases. Research has shown high levels of loneliness among college students attending a large midwestern university in the United States (Wei, Russell, Zakalik, 2005), this was not consistent with the findings in the current study, perhaps this is due to a higher level of

participants studying abroad and at a significantly more populated university. In this study only two participants studied abroad, and universities/colleges were significantly less populated. A study conducted by Adamle, Riley and Carlson (2009), discovered that college students had a positive attitude towards participating in canine therapy, which includes visiting certified pet therapy dogs. The results of this study show that the mere presence of a dog at home will not affect levels of loneliness as previously hypothesised, perhaps to actively spend time with the dog could have a greater impact. As results of this study were not statistically significant regarding loneliness and dog-owning, perhaps by using a larger and slightly older sample size could increase statistically significant results. As we researched this topic with a student population, it is most likely that students live at home or with other students. Only two of the participants in the study studied abroad that are also most likely to be living with other students or a host family. Research suggests that living alone and not owning a pet is associated with higher feelings of loneliness (Stanley, Conwell, Bowen & Van Orden, 2014). As we researched a student population, perhaps repeating the study with a larger/older population would produce more significant results. Zasloff and Kidd (1994) state that single women living alone are more vulnerable to loneliness and by owning a pet could reduce levels of loneliness. Perhaps this population could be tested in a future study. Similarly, Beal (2006) also found that older females report more feelings of loneliness than males, this too could be a potential population of interest for a repeat study.

In relation to the third research question, it was hypothesised that there would be an interaction between gender, loneliness, stress and dog-owning but no interaction was found. There was no statistically significant difference on the outcome of loneliness for females ($M = 51$) and males ($M = 14$) who own a dog and females ($M = 60$) and males ($M = 17$) who don't own a dog. It is interesting to note there is a slight difference in the loneliness levels of females. It appears that females that do own a dog are slightly less lonely than females who

don't, but this difference was not statistically significant. However, a statistically significant difference between gender on the outcome of stress was discovered, results show that females ($M = 23$) are more stressed than males ($M = 20$). However, there was no interaction between gender and dog-owning in this result. This finding is consistent with the Abouserie (1994), using a similar population, the study that found a statistically significant difference in the stress levels of undergraduate students, female stress levels are higher in academic and life stress. Allen, Blascovich and Tomaka (1991) found that females performing a stressful task in the presence of their pet dog displayed little to no physiological reactivity, they felt less threatened and performed better. These findings suggest that females are naturally more stressed than males but become less stressed in the presence of their pet dog. However, this study was longitudinal in design and was tested on an adult population, participants performed a task once in the presence of an examiner and again in the presence of a dog. The results of the current study could have been statistically significant given a larger sample size; the sample size of the study was too small to infer generalizability.

Strengths of this study include an accessible population with many participants owning a dog. Students were recruited through social media which is a quick, easy and cheap way to collect primary data as social media is extremely popular among students. The topic of the study is also relevant and relatable to students as mental health and well-being is a topic of interest among young people today, as well as dogs. However, there were numerous limitations in the current study. Limitations include a small number of participants recruited for the study, perhaps an increased time frame would allow more participants to be recruited and more statistically significant data to be found. The small number of participants limits generalizability of the findings. Participants in the study appeared to be of a less stressed and lonely population as opposed to other populations, for example people with disabilities, single people, people living alone and older generations. The data found was not robust

enough to explain the complex issue. In addition, only two participants studied abroad so the population involved in the current study lived at home. This may affect their levels of stress and loneliness causing them to be less stressed and less lonely as they live among others and do not encounter struggles of living alone. More-over, another limitation of this study could potentially be that data was self-reported by participants which could lack honesty about their feelings or could be biased due to their feelings on that particular day it was completed.

Future studies could explore the possibility of repeating this study on a different population, in particular an older population, as both groups have different levels of stress and stressors and are more vulnerable to loneliness. The greater implications of this study include building on existing knowledge regarding the effects of dog-owning on everyday life.

In conclusion, the results of this study reject all 3 hypotheses that dog-owning reduces levels of stress and loneliness among male and female students. The study aimed to explore the effects of dog-owning on students' levels of stress and loneliness, the impact of dog-owning on gender and stress and the influence of gender and dog-owning on loneliness were tested. A bigger sample size and a more hyper-sensitive population is needed to verify the relationship between dog-owning, stress and loneliness. Although the results of this study do not reflect a significant effect of dog-owning on students' levels of loneliness and stress, the topic itself still bares relevance to other populations and further research may develop stress and loneliness interventions. Differences were found in relation to male and female stress levels and loneliness levels of female dog-owners; however, more complex research is required for a statistically significant result. Research is constantly developing new ways to tackle negative feelings, such as stress and loneliness, relevant to all ages and genders. This study represents another step in the direction of research regarding dog-owning and human life and new ways to decrease levels of stress and loneliness among all people suffering with this issue to improve quality of life.

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Appendix

PARTICIPANT INFORMATION SHEET

INVITATION

You are being asked to take part in a research study on our investigation of the effects of dog-owning on students' levels of stress and students' levels of loneliness. We aim to prove that as well as influencing our levels of independence, trust, security and our physical health, that dogs can have a positive effect on our stress levels and loneliness. In this study, you will be asked to complete the following surveys indicating your levels of stress and your levels of loneliness.

TIME COMMITMENT

This study will take roughly 15-20 minutes

PARTICIPANTS' RIGHTS

Considering that this survey is done online, you may decide to stop and start the survey at your leisure, there is no time limit attached to answering the questions. You may decide to stop being a part of the research study at any time without explanation or penalty. However, once your survey is submitted it cannot be removed from the study due to the anonymity of the survey.

BENEFITS AND RISKS

Answering questions regarding stress and loneliness may trigger upsetting emotions for certain participants. Should this occasion arise you can contact me at '1742176@student.ncirl.ie' for any questions or queries you may have.

ASK ME ANYTHING

If after reading this information and have a few questions regarding the study or if something is not clear, please contact me at x17421766@student.ncirl.ie with any queries you may have. Likewise, if you have completed the survey and wish to include any feedback regarding issues with the survey or are interested in the results of the study.

UCLA Loneliness Scale

Scale: INSTRUCTIONS: Indicate how often each of the statements below is descriptive of you.

O indicates "I often feel this way"

S indicates "I sometimes feel this way"

R indicates "I rarely feel this way"

N indicates "I never feel this way"

1. I am unhappy doing so many things alone O S R N
2. I have nobody to talk to O S R N
3. I cannot tolerate being so alone O S R N
4. I lack companionship O S R N
5. I feel as if nobody really understands me O S R N
6. I find myself waiting for people to call or write O S R N
7. There is no one I can turn to O S R N
8. I am no longer close to anyone O S R N
9. My interests and ideas are not shared by those around me O S R N
10. I feel left out O S R N
11. I feel completely alone O S R N
12. I am unable to reach out and communicate with those around me O S R N
13. My social relationships are superficial O S R N
14. I feel starved for company O S R N
15. No one really knows me well O S R N
16. I feel isolated from others O S R N
17. I am unhappy being so withdrawn O S R N
18. It is difficult for me to make friends O S R N
19. I feel shut out and excluded by others O S R N
20. People are around me but not with me O S R N

Scoring:

Make all O's =3, all S's =2, all R's =1, and all N's =0. Keep scoring continuous.

PERCEIVED STRESS SCALE

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by circling how often you felt or thought a certain way.

Name _____

Date _____ Age _____ Gender (Circle): M F

Other _____

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly?

0 1 2 3 4

2. In the last month, how often have you felt that you were unable to control the important things in your life?

0 1 2 3 4

3. In the last month, how often have you felt nervous and "stressed"?

0 1 2 3 4

4. In the last month, how often have you felt confident about your ability to handle your personal problems?

0 1 2 3 4

5. In the last month, how often have you felt that things were going your way?

0 1 2 3 4

6. In the last month, how often have you found that you could not cope with all the things that you had to do?

0 1 2 3 4

7. In the last month, how often have you been able to control irritations in your life?

0 1 2 3 4

8. In the last month, how often have you felt that you were on top of things?

0 1 2 3 4

9. In the last month, how often have you been angered because of things that were outside of your control?

0 1 2 3 4

10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? 0 1 2 3 4

