The Effect of Pet Ownership on the Perception of Stress after reading a Flooding Scenario

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Abstract

Pet ownership influences individuals in several different ways. This study investigates the influence of pet ownership on the perception of stress of the pet owner after reading a flooding scenario with a negative outcome. A total of 150 individuals voluntarily participated in the quantitative questionnaire study. At the beginning of the questionnaire the participants were either presented with a scenario with a negative outcome or no scenario. Next to the Perceived Stress Scale the participants answered some demographic questions, as well as questions concerning their pet ownership background and pet attachment. Three independent t-test were performed to investigate the difference between the perception of stress of pet owners and non-pet owners, the difference between the perception of stress after reading a scenario with a negative outcome and a control group with no scenario, and the difference between the perception of stress of pet owners and non-pet owners. The results showed that pet ownership does not influence the perception of stress after reading a scenario with a negative outcome. The negative scenario does not increase the perception of stress of the participants, the control group showed a higher level of perception of stress. Moreover, is the perceived stress of pet owners higher after reading the negative scenario than the perceived stress of the non-pet owners. Further research could select a more realistic scenario based on the environmental risks and implement another variable to check if the scenario has the desired effect.

Keywords: Pet ownership, pet attachment, perceived stress

1. Introduction

People around the world share their environment with animals in a variety of ways. Next to, for example, farm animals, people share their houses with pets as companions (Edney, 1995). Over half of the people around the world have at least one pet according to a survey conducted by Global GfK in 2016. A great majority of these pets are dogs with 33% and cats with 23%. Owning a pet does not only carry several positive aspects but also negative once. Most of the negative aspects of a pet ownership concern the health of the pet owner or the people around them. There are serious issues that can occur like communicable disease and injuries, but also less damaging incidents like nuisances or aesthetic offences (Edney, 1995). Moreover, can the loss of a loved pet cause distress in the pet owner, especially when they had a close relationship (McNicholas, Gilbey, Rennie, Ahmedizai, Dono, et al., 2005). Nevertheless, being a pet owner has physiological and psychological health benefits.

One well known fact is that the interaction with a pet lowers the blood pressure (Friedmann, Katcher, Lynch, & Thomas, 1980). Another benefit that comes along with the ownership of dogs or cats is the increased physical activity, as well as an increased overall fitness (Islam, & Towell, 2013). Moreover, owning a pet promotes the social harmony in the environment as well as the social interaction. This improved social interaction has a positive effect on psychological disorders like depression, given that those disorders are proven to decrease with interaction (Brodie, & Biley 1999). A previous study by Zorc (2018) investigated the effect of pet ownership on the perception of stress during the last month. The results showed no significant effect and there remains need for research on that field. In the current study the focus lies on a scenario with a negative outcome, which might reinforce the perception of stress of the individual. Therefore, the research question of this study is: Does a pet ownership influence the perception of stress of the pet owner after reading a negative scenario?

1.1 Perception of Stress

The perception of stress is a highly subjective factor and therefore differs in every individual (Martin, & Pihl, 1986). Levels of perceived stress are higher in women than in men (Anbumalar, Dorothy, Jaswanti, Priya, & Reniangelin, 2017). Lazarus and Folkman (1984) defined perceived stress as follows: “Stress arises when individuals perceive that they cannot adequately cope with the demands being made on them or with threats to their well-being”. In 2010, the American Psychological Association found that women are more like to report to have a great

deal of stress than man. Stress can cause a lot of tension in individuals and can even result in psychological and physical issues. People under high stress levels can develop health related problems, for example, high blood pressure, poor healing or other medical problems (Medical Definition of Stress, 2016). Next to that, stress was identified to play a key role as a risk factor in the development of psychiatric illness, for example, panic, mood or anxiety disorder (Cohen, Janicki-Deverts, & Miller, 2007). Stress in individuals can be caused by internal factors which include illness or by external factors like the environment. Stress is often associated with negative aspects as listed above, but in general the perception of stress is a natural response to events in our live known as the ´fight or flight´ response. The human´s endocrinological and neurological system release catecholamine hormones in the human body which produces an immediate physical reaction. This response is important in situation where the individual is under risk, for example when an animal is attacking. The individual then can either fight the animal or flee. In the modern world this action is usually not necessary, but the bodily reaction is still present in situations causing individuals stress. Therefore, a sufficient stress management is needed to cope with stressful life events (Medical Definition of Stress, 2016). Due to the overall positive psychological effects of pets on their owners, the question arises what the relation of pet ownership and stress perception looks like.

1.2 Pet ownership and perception of stress

Research provides support for the beneficial effect of pets on perceived stress in a variety of different studies. A study conducted by Lee and Chai (2015) supports the assumption that pet owners display a lower perceived stress level than non-pet owners. The results showed that when university students own a pet it could appease their feelings of loneliness and stress when apart from their families. The argumentation for reasons for a reduction of perceived stress differs among the studies. While Lee, and Chai support the assumption that the companionship of the pet reduces the loneliness and lowers the perception of stress, McConnell, Brown, Shoda, Stayton and Martin (2011) argued that a fulfillment of the social needs by the pets is the reason. Another study examined a reduction of perceived stress after watching a traumatic film compared to a toy and human control group (Lass-Hennemann, Peyk, Streb, Holz, & Michael, 2014). Following the above findings from previous literature the following hypothesis was generated:

H1: Pet owner report a lower perception of stress than non-pet owner.

1.3 Life events and pet ownership

According to Lazarus and Folkman are stressful life events are discrete experiences which disrupt the usual activities of the individual. Those events are one type of stressor when it comes to the perception of stress. A stressful life event can differ in type, for example losing a loved one or job-related changes. In which way the individual is influenced by the life event depends on the nature of the event. This includes whether they are unpredictable, uncontrollable or undesirable. Subjective perception is a crucial factor in the way individuals interpret their meanings (Lazarus, & Folkman, 1984). Individuals with a high deficit in social support experience more stressful life events, as well as higher levels of perceived stress and have a greater risk of depression (Redinbaugh, MacCallum, & Kiecolt-Glaser, 1995). A study carried out by Siegel (1990), investigating medical visits by elderly individuals being pet owners or not, showed that the pet owners compared to the non-pet owners made fewer visits during one year. More interesting for the current study, when individuals experienced a stressful life event during the 6 months before the study pet owners did not increase their visits whereas non pet owners which perceived similar stressful life events did increase their medical visits. The pet owners, in this case owners of dogs, indicated that they felt more secure after spending time with their dogs. Siegel in this study concluded that the pet ownership influenced the ability to cope with losses. Based on the above information the following and second and third hypotheses were generated:

H2: The perception of stress is higher after reading the negative scenario than no scenario

H3: The perception of stress is lower in pet owners than non-pet owners after reading the scenario with a negative outcome.

1.4 Research purpose

The aim of this research is to obtain a better picture of the effect of pet ownership on the perception of stress after a negative life event (negative scenario). Further knowledge of the positive influence of owning a pet on the perception of stressful life events could change the way people see and make use of pets. The areas of pets in therapeutic conditions are expanding, but also the awareness of importance of pets in individuals' daily lives might change.

In the current research the stressful life event is imitated by a scenario with a negative outcome. Given that the perception of stress in those life events is subjective the participants of the current study might differ in their degree of perception. Nevertheless, given that stressful life events are acting as stressors in the perception of stress the level of perceived stress is considered to be high. In the following sections the methods of the study are going to be described, then the results and at the end the conclusion and discussion including limitations as well as recommendations for further research.

2. Methods

2.1 Research design

The study conducted for this research is a quantitative questionnaire survey (see Appendix A for the questionnaire). It was designed to investigate the correlational relationship between a pet ownership and the perception of stress and the influence of a moderator on this relationship. The pet ownership in this study acts as the independent variable whereas the perception of stress acts as the dependent variable. Perception of stress is thought to be increased by a negative scenario. This study is a collaborative study with two other researchers which focused on other variables, as well as on a positive scenario.

2.2 Participants

In this study 256 individuals voluntarily participated, of which 44 had to be excluded because they did not finish the survey. Furthermore, the participants with a positive scenario were excluded (N=62), because this study only focuses on the negative scenarios. Of the remaining 150 participants 67 were presented with a negative scenario and the rest (N=83) acted as the

control group. Among the participants 75,3 % were female and 24,7% male. The age range varied from 18 to 62 whereas the majority of participants was between 18 and 25. 33,3% of the participants had their current place of residence in the Netherlands, 61,3% in Germany and 5,3% elsewhere. The degrees of the participants differed from a lower level degree up to a Master's degree, while the majority had a VWO, Abitur or Highschool degree (86%). From all the participants 81 are pet owners and 69 are not. Of the participants owning a pet 16% owned a pet in the last three years and 34% did not. Within this 16% of pet owners during the last three years 3,3% confirmed to own a cat(s), 4,7% a dog(s), 0,9% both and 7,1% another animal.

2.3 Materials

For this study a self-reported questionnaire was conducted, consisting of either a scenario with a positive outcome, one with a negative outcome or a control group which did not receive any scenario. As mentioned above in the current study the positive scenario was not used. After the scenarios one question was stated in order to determine if the participants perceived the scenario as either positive or negative 'To what extend did you perceive the scenario as positive or negative?'. The negative scenario is a short description of a flooding situation in the participants close environment through which all of the belongings are going to be destroyed. Then an already existing standardized questionnaire with slightly changed wording followed, called Perceived Stress Scale (see Appendix B for the Perceived Stress Scale). This Perceived Stress Scale measures the degree to which situations are appraised as stressful. In the original scale the focus lied on the last month which was changed into 'During reading the scenario' in case a scenario was presented beforehand. The scale consists of ten items which could be answered by a five-point Likert scale ranging from 'Strongly disagree' (0) to 'Strongly agree' (4). The scale showed a strong validity according to previous studies in which a higher Perceived Stress Scale score was associated with greater vulnerability to stressful life-event-elicited depressive symptoms (Cohen, Kamarck, & Mermelstein, 1994). The reliability was checked for the Perceived Stress Scale by calculating the Cronbach's alpha. The internal consistency was sufficiently high with a .83 Cronbach's alpha. Next to that, the Perceived Stress Scale has a normal distribution and loads on two factors according to the factor analysis (see Appendix C for the factor loadings). The results from the current research are going to be compared to the study by Cohen, Kamarck, and Mermelstein (1994) which investigated the perceived stress level of a large sample (N = 2.387). Given that the majority of participants of the current study are between 18 and 25 a smaller sample from this study in the age range of 18-29 (N = 645)

will be used. The mean scores of this sample were 14.2 with a standard deviation of 6.2. Afterwards the participants were asked four demographic questions, including their age, gender, place of residence and degree. Followed by ten questions identifying whether or not the participants own a pet and in case they own a pet what kind of pet it is. Right after the identification of the pet owners, the time they spent with their pet was determined, as well as their attachment in form of a five-point Likert scale with four items, called Attachment scale. This Attachment scale ranged from 'Strongly disagree' to 'Strongly agree' and higher scores were considered to represent a higher valuable relationship between the pet owner and their pet. The reliability was calculated for the Attachment scale. With a Cronbach's alpha of .66 the reliability is acceptable. When comparing the Cronbach's alpha to the one from the study by Zorc (2018) with .81 it can be seen that it is lower. For the data analysis IBM SPSS Statistics 25 has been used.

2.4 Procedure

The survey was published via Qualtrics, the link of the survey was posted in social media and made available for University students via Sona System, a system used by the University of Twente through which students participate in other students' studies in order to gain credits. Next to that, calling cards with a QR code were handed out to people on the streets. Therefore, the participants were obtained through snowball sampling. Filling out the questionnaire took place in an uncontrolled environment given that it is an online survey and therefore could be filled out wherever the participant wants. At the beginning of the questionnaire the participants were informed through an Informed consent, that filling out the questionnaire is completely anonymous and that they can withdraw at any time. After reading the informed consent the participants had to confirm that they agree to these terms and that they were willing to continue. The questionnaire consists of either a scenario with a positive or negative outcome or no scenario, a self-reported questionnaire, four demographic questions, ten questions identifying pet ownership and one slide as well as one scale determining the attachment. To complete the questionnaire, it took approximately 10-15 minutes. At the end of the questionnaire a 'Thank you' note was stated alongside the purpose of the study and an email address in case the participants had further questions.

3. Results

3.1 Descriptive statistics

First, the descriptive statistics of the Perceived Stress Scale (PSS) as well as of the Attachment Scale were calculated. The mean score of the PSS was 1.83 with a standard deviation of .69 and the mean score of the Attachment Scale was 4.66 with a standard deviation of .46.

Table 1

Descriptive statistics of PSS and Attachment Scale

	N	Mean	SD
Perceived Stress	150	1.83*	.69
Attachment	83	4.66**	.46

*Note: An average score of the perceived stress is 2, minimum 0 and maximum 4

**Note: An average score of the attachment is 3, minimum 1 and maximum 5

In order to compare the mean scores and the standard deviation of all participants on the PSS to the mean scores of a large sample from a study by Cohen, Kamarck, and Mermelstein (1994), all the responses were added up without being divided by the number of the items. High scores on the Perceived Stress Scale indicate a higher level of perceived stress. In the current study the mean score of all participant´s perception of stress was 18.31 (SD = 6.85)

The correlational relationship between the variables has been tested by using the Pearson correlation(r). Firstly, a relationship between the dependent variable perceived stress and the independent variable pet ownership has been tested. Next to that, the correlational relationship between the pet ownership and the pet owner's attachment with his pet, as well as a correlation between the perceived stress and the attachment. When taking a look at table 2 the variable pet ownership and perceived stress show a weak negative correlation. The p-value (p = .81) was high, which means that there is no statistically significant correlation between the variables pet ownership and perceived stress. Moreover, there is a weak negative relationship between the pet ownership and the attachment. It is not statistically significant (p = .19) that there is a correlation between the two variables pet ownership and attachment. The last correlation that has been checked was between the attachment with the pet and the perception

of stress of the participant. Here the table shows a negative relationship as well, which is weak. Again, there is no statistically significance correlation, given that the *p*-value is larger than the alpha.

Table 2

Pearson Correlations(r)

Group	N	Pet ownership	Perceived Stress	Attachment
Pet ownership	150	1	-.02	-.15
Perceived Stress	150	-.02	1	-.18
Attachment	83	-.15	-.18	1

3.2 Hypothesis Testing

In order to answer the first hypothesis 'Pet owners report a lower perception of stress than non-pet owner.' an independent t-test was performed only for the control group with the Perceived Stress Scale as the dependent variable and pet / non pet ownership as the independent variable. The results showed that the Pet owners (N = 44) score higher (M = 20.93) on the Perceived Stress Scale with a standard deviation of 7.12 compared to the non-pet owners (N = 39) with a mean of 18.31 and a standard deviation of 5.28. The independent samples test does not show a statistically significant difference between the pet owners and non-pet owners $t(81) = 1.88$, p = .18.

The second hypothesis 'The perception of stress is higher after reading the negative scenario than no scenario' could also be answered by performing an independent t-test. Therefore, the Perceived Stress Scale is the dependent variable and the group, so whether or not the participant had a scenario, is the independent variable. The group statistics showed that the means (M = 19.70) of the control group is higher than the mean of the group with a negative scenario (M = 16.58). The analysis showed that there is a significant difference $t(148) = 2.835$, p = .005. Therefore, the control group perceives a higher level of stress than the group with a negative scenario.

At the end, the last hypothesis 'The perception of stress is lower in pet owners than non-pet owners after reading the scenario with a negative outcome.' was as well analyzed by performing an independent sample t-test. Therefore, in the analysis only the negative group was taken into consideration. The perceived stress was used as the dependent variable, while the pet ownership was used as the independent variable. When looking at the group statistics the mean of the pet owners with a negative scenario is lower (M = 15.46) than the mean of the non-pet owners with a negative scenario (M = 17.97). Nonetheless, the independent samples test shows that there is no statistically significant difference between the two groups $t(65) = -1.47$, $p = .15$.

3.3 Additional Analysis

A simple linear regression was calculated to predict the participant´s perceived stress based on their pet ownership as well as the pet attachment. Both groups, control and negative has been used. The results showed that no significant regression equation was found ($F(2, 80) = 1.38$, $p = .26$), with an adjusted R^2 of .01.

Table 3

Linear regression with perceived stress as the dependent variable

Variable	Unstandardized Coefficients		Standardized	
	B	Std. Error	Beta	Sig.
Constant	32.91			
Attachment	-.75	.45	-.19	.10
Pet ownership	-.76	2.34	-.04	.75
R^2	.03			
Adjusted R^2	.01			
$F(df=2; 80)$	3.66			

4. Conclusion and Discussion

4.1 Conclusion

When concluding the findings, it can be said that the first hypothesis has been rejected. Pet ownership does not lower the perception of stress. Furthermore, the second hypothesis, which states that the perception of stress is higher after reading the negative scenario compared to no scenario (control group), has been rejected as well. Even though there is a significant difference between the two groups ($p = .005 < .05$), the control group actually scored higher on the perception of stress than the group with a negative scenario.

Both hypotheses, first and second, were leading to the last hypothesis that the perception of stress is lower in pet owners compared to non-pet owners after reading the negative scenario. This last hypothesis has also been rejected. In fact, it was found that the perception of stress is higher in pet owners than non-pet owners after reading the negative scenario. Furthermore, the simple linear regression showed that there are no significant relations between the variables.

Based on the results it can be concluded that pet ownership does not influence the perception of stress after reading a scenario with a negative outcome. Thus, pet owners did not indicate a lower perceived stress level than non-pet owners after reading the scenario.

4.2 Discussion

In the following some limitations are mentioned which were found during and after conducting the study. Those limitations might be solved by following some recommendations. At first, the perceived stress scores of the participants were very high compared to a larger sample (Cohen, Kamarck, & Mermelstein, 1994). There are several possibilities that might explain this overall high perception of stress. One of them could be that given that most of the participants are in the age range of 18-25 and therefore mostly in an educational setting, their perception of stress is generally high because of other stressors. A possible stressor might be that they are currently moving or looking for a new job (Lazarus, & Folkman, 1984). In a follow up study, it could therefore be interesting to try to reach more people from a higher age range in order to see the differences. Especially because the study by Cohen, Kamarck, and Mermelstein (1994) showed that the scores decrease with age. Another possible explanation for the overall high scores could be that since 1994 (the year the study was published) a cultural change occurred. One of these changes could be the increased focus on the career and the educational success associated with it, which results in high pressure on individuals, especially students.

When analyzing the second hypothesis it was found that the participants scored higher on perceived stress when they had no scenario than when they had the negative scenario. Given that the scenario should increase the level of perceived stress those results were rather unexpected. A possible explanation for that limitation could be that the questionnaire was published via Sona System. Therefore, most of the participants are students which follow the goal to obtain credits. Thereby, the motivation to take the study very serious and invest a lot of time in reading the scenarios and questions might be pretty low. Future researchers are recommended to use a different procedure to recruit participants. Next to that another variable which focuses on the influence of a stressor, the negative scenario, for example measuring emotions could be included. This additional variable could show whether or not the scenario increases the emotions of the participants and therefore can be compared to the variable of perceived stress.

Moreover, this study used a written down flooding scenario with a negative outcome as a manipulation, this can be questioned in two different ways. On the one hand, as mentioned before, the participants are mostly students obtained through Sona system, therefore the risk of flooding might not be on the top of their mind. Even though the news are reporting the risks in the Netherlands especially through the climate change (Berliner Zeitung, 2018) and there were flooding in the southern part of the Netherlands at the time of the data collection, the risk perception of flooding might be rather low in that area. Therefore, it might be interesting for a follow up study to use a scenario the participants can better relate to and which might increase their perception of stress more clearly. On the other hand, the fact that the scenario is only written down could be a limitation. Therefore, the written scenario might not increase the perception of the risk as intended. A possible explanation could be that the participants might not read the scenario fully and therefore miss a lot of important information. Along with that it might be difficult to picture such a scenario and, in that way, trigger the desired effect. In order to avoid that it is advisable when researchers conducting a similar study would use a more realistic trigger, for example a newsletter or a video from the news on the television.

As mentioned before most of the participants are in the age range from 18 to 25 and therefore mostly students. Most of the students live in a residential accommodation or shared flat and do not live at home. It can therefore reasonably be assumed that most of the participants which indicated that they own a pet in fact have a pet at their parent’s place, but not at their current residence. This could highly influence the relationship with their pets and should be further investigated in future studies. Additional questions regarding the living situation with the pet could clarify the circumstances.

In this study an Attachment Scale was used, the reliability (α = .66) of the scale was acceptable, but a higher reliability would be more favorable. Nevertheless, the reliability is high enough for using the scale in future studies. A study by Wu, Wong, and Chu (2018) highlighted the importance of the pet attachment of the pet owner on the perception of stress. According to the study the attachment to the pet and perceiving it as a family member can reduce stress. Hence, in future studies the focus should lie mostly on the attachment and not merely on the pet ownership itself. To achieve that the number of items in the Attachment Scale could be increased. Moreover, the researcher should consider the degree of attachment in the analysis of the pet ownership. In that sense only participants with a high degree should be included in the study.

To summarize, for future studies it would be interesting to use a more realistic scenario, which the participants could imagine more easily. The participant should be familiar with the risk to increase the stressor. Instead of a simply written down scenario a newsletter or a video from the news on the television could be used. Next to that, future researchers should include a higher age range, especially because compared to students, elderly people are more likely to have their pets around. In order to further improve the study an enlarged sample would be useful, as well as recruiting the participants through different platforms. This could increase the motivation to invest time and take the study seriously. Furthermore, future researchers should take the attachment to the pet in further consideration. In addition to that would it be interesting to implement another variable testing whether or not the scenario has the intended effect.

References

American Psychological Association. (2010). Stress and Gender. Retrieved from https://www.apa.org/news/press/releases/stress/2010/gender-stress.pdf

Anbumalar, C., Dorothy, A. P., Jaswanti, V. P., Priya, D., & Reniangelin, D. (2017). Gender Differences in Perceived Stress levels and Coping Strategies among College Students. *International Journal of Indian Psychology*, *4*(4), 22-33.

Berliner Zeitung. (2018, March 16). Niederlande: Dämme schützen nicht mehr vor Hochwasser und Sturmflut. Retrieved May 30, 2019, from

https://www.berliner- zeitung.de/panorama/niederlande-daemme-schuetzen-nicht-mehr-vor-den-wassermassen-29558106

Brodie, S. J., & Biley, F. C. (1999). An exploration of the potential benefits of pet-facilitated therapy. *Journal of clinical nursing*, *8*(4), 329-337.

Cohen, S., Janicki-Deverts, D., & Miller, G. E. (2007). Psychological stress and disease. *Jama*, *298*(14), 1685-1687.

Cohen, S., Kamarck, T., & Mermelstein, R. (1994). Perceived stress scale. *Measuring stress: A guide for health and social scientists*, 235-283.

Edney, A. T. (1995). Companion animals and human health: an overview. *Journal of the Royal Society of Medicine*, *88*(12), 704p.

Friedmann, E., Katcher, A. H., Lynch, J. J., & Thomas, S. A. (1980). Animal companions and one-year survival of patients after discharge from a coronary care unit. *Public health reports*, *95*(4), 307.

Global GfK. (2016, May). Global Studies - Pet ownership. Retrieved March 1, 2019, from https://www.gfk.com/global-studies/global-studies-pet-ownership/

Islam, A., & Towell, T. (2013). Cat and dog companionship and well-being: A systematic review. *International Journal of Applied Psychology*, *3*(6), 149-155.

Lass-Hennemann, J., Peyk, P., Streb, M., Holz, E., & Michael, T. (2014). Presence of a dog reduces subjective but not physiological stress responses to an analog trauma. *Frontiers in psychology*, *5*, 1010.

Lazarus, R. S., and Folkman, S. *Stress, Appraisal, and Coping.* New York: Springer, 1984.

Lee, V. K., & Chai, M. S. (2015). Dog ownership, perceived social supports and stress among university students. *American Journal of Applied Psychology*, *4*(3-1), 45-50.

Martin, J. B., & Pihl, R. O. (1986). Influence of alexithymic characteristics on physiological and subjective stress responses in normal individuals. *Psychotherapy and Psychosomatics*, *45*(2), 66-77.

McConnell, A. R., Brown, C. M., Shoda, T. M., Stayton, L. E., & Martin, C. E. (2011). Friends with benefits: on the positive consequences of pet ownership. *Journal of personality and social psychology*, *101*(6), 1239.

Medical Definition of Stress. (2016, May 13). Retrieved from

https://www.medicinenet.com/script/main/art.asp?articlekey=20104

Redinbaugh, E. M.; MacCallum, R. C.; and Kiecolt-Glaser, J. K. "Recurrent Syndromal Depression in Caregivers." *Psychology and Aging* 10 (1995): 358–368.

Siegel, J. M. (1990). Stressful life events and use of physician services among the elderly: the moderating role of pet ownership. *Journal of personality and social psychology*, *58*(6), 1081.

Wu, C. S. T., Wong, R. S. M., & Chu, W. H. (2018). The Association of Pet Ownership and Attachment with Perceived Stress among Chinese Adults. *Anthrozoös*, *31*(5), 577-586.

Zorc, E. (2018). The effect of pet ownership on student´s level of perceived stress. *University of Twente*

Appendix A

Questionnaire

Welcome, thank you for taking the time to participate in this survey.

In a moment, you will be asked to answer a number of questions about yourself.

We would like you to be mindful when answering the questions. There are also items included in the survey related to demographic data. This survey will take approximately 10-15 minutes.

But first, we would like to present the terms and conditions to you.

The data collected in this survey will remain anonymous, therefore individual participants will not be able to be identified. Furthermore, the data is confidential, thus it will not be made publicly available. Since the questionnaire is in English, the participant is assumed to be proficient in English. The participant has the right to stop the survey at any time, without giving reasons. Finally, all questions must be answered in order to complete the survey.

Do you agree to these terms?

In the following, you will read a short scenario. Read it carefully and imagine yourself being in that situation. After that, you are asked to answer some questions.

You live in a small city close to one of the major rivers (Rhine, Meuse or Waal). The area you live in will be flooded due to heavy rain and snow in Switzerland, Southern Germany, and France a week from now if the government does not come up with a solution to build higher dikes. You are scared that you have to leave your house and move away. You grew up in that area and have a lot of memories there. Now you have to leave these behind even though you do not want to.
A few days before you have to leave, you receive a letter from the government. This letter announces that they have to inform all the citizens that they did not manage to find a solution for building up the dikes. Therefore, you have to leave your house behind because the water level in the river is likely to reach a level that it will flood the whole area and your city.
To what extend did you perceive the scenario as positive or negative?

In the following, you will read a short scenario. Read it carefully and imagine yourself being in that situation. After that, you are asked to answer some questions.

You live in a small city close to one of the major rivers (Rhine, Meuse or Waal). The area you live in will be flooded due to heavy rain and snow in Switzerland, Southern Germany, and France a week from now if the government does not come up with a solution to build higher dikes. You are scared that you have to leave your house and move away. You grew up in that area and have a lot of memories there. Now you have to leave these behind even though you do not want to.

A few days before you have to leave, you receive a letter from the government. This letter announces that they have come up with a solution and that they can make the dikes higher. Therefore, the village cannot be flooded anymore, and you and all the citizens do not have to leave their house anymore.

To what extend did you perceive the scenario as positive or negative?

Please read the questions carefully and tick the box that fits best.

*NOTE: If you did not get a scenario, replace "during reading the scenario", to "during the last month" and fill in the answers.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
During reading the scenario, have you been upset because of something that happened unexpectedly?	○	○	○	○	○
During reading the scenario, have you felt that you were unable to control the important things in your life?	○	○	○	○	○
During reading the scenario, have you felt nervous and "stressed"?	○	○	○	○	○
During reading the scenario, have you felt confident about your ability to handle your personal problems?	○	○	○	○	○
During reading the scenario, have you felt that things were going your way?	○	○	○	○	○

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
During reading the scenario, have you found that you could not cope with all the things that you had to do?					
During reading the scenario, have you felt been able to control irritations in your life?					
During reading the scenario, have you felt that you were on top of things?					
During reading the scenario, have you been angered because of things that were outside of your control?					
During reading the scenario, have you felt difficulties were piling up so high that you could not overcome them?					

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Please read the following statements carefully and tick the box that fits best.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I will be able to achieve most of the goals that I set for myself.					

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
When facing difficulties tasks, I am certain that I will accomplish them.	○	○	○	○	○
In general, I think that I can obtain outcomes that are important to me.	○	○	○	○	○
I believe I can succeed at most any endeavour to which I set my mind.	○	○	○	○	○
I will be able to successfully overcome many challenges.	○	○	○	○	○
I am confident that I can perform effectively on many different tasks.	○	○	○	○	○
Compared to other people, I can do most tasks very well.	○	○	○	○	○
Even when things are tough, I can perform quite well.	○	○	○	○	○

Please fill in your age.

Page Break

Nationality

Where do you live?

- ○ The Netherlands
- ○ Germany
- ○ Elsewhere

Page Break

Q45

What is the highest degree or level of school you have completed?

- Lower level
- VWO/Abitur/Highschool
- MBO
- HBO/Applied University
- Bachelor
- Master
- PhD
- Other

Page Break

Gender

What is your gender?

- Male
- Female

Page Break

P1

Do you own pet(s)?

- Yes
- No

Condition: No Is Selected. Skip To: Did you own pet(s) in the last three ....

Condition: Yes Is Selected. Skip To: What kind of pet(s) do you own?.

Page Break

P2

What kind of pet(s) do you own?

- Cat(s)
- Dog(s)
- Cat(s) and Dog(s)
- Others

Condition: Cat(s) Is Selected. Skip To: How many cat(s) do you own?.

Condition: Dog(s) Is Selected. Skip To: How many dog(s) do you own?.

Condition: Cat(s) and Dog(s) Is Selected. Skip To: How many cat(s) and dog(s) do you own?.

Condition: Others Is Selected. Skip To: Thank you for participating. The purp....

Page Break

P3

Did you own pet(s) in the last three years?

- Yes
- No

Condition: No Is Selected. Skip To: Thank you for participating. The purp....

Condition: Yes Is Selected. Skip To: What kind of pet(s) did you own in th....

P4

What kind of pet(s) did you own in the last three years?

- Cat(s)
- Dog(s)
- Cat(s) and Dog(s)
- Others

Condition: Cat(s) Is Selected. Skip To: How many cat(s) did you own in the la....

Condition: Dog(s) Is Selected. Skip To: How many dog(s) did you own in the la....

Condition: Cat(s) and Dog(s) Is Selected. Skip To: How many cat(s) and dog(s) did you ow....

Condition: Others Is Selected. Skip To: Thank you for participating. The purp....

Page Break

P5

How many cat(s) do you own?

- 1
- 2
- 3
- 4 or more

Condition: 1 Is Selected. Skip To: .

Condition: 2 Is Selected. Skip To: .

Condition: 3 Is Selected. Skip To: .

Condition: 4 or more Is Selected. Skip To: .

Page Break

P6

How many dog(s) do you own?

- 1
- 2
- 3
- 4 or more

Condition: 1 Is Selected. Skip To: .

Condition: 2 Is Selected. Skip To: .

Condition: 3 Is Selected. Skip To: .

Condition: 4 or more Is Selected. Skip To: .

Page Break

P7

How many cat(s) and dog(s) do you own?

Cat(s)

Dog(s)

Condition: Cat(s) Is Not Empty. Skip To: .

Condition: Dog(s) Is Not Empty. Skip To: .

Page Break

P8

How many cat(s) did you own in the last three years?

- 1
- 2
- 3
- 4 or more

Condition: 1 Is Selected. Skip To: .

Condition: 2 Is Selected. Skip To: .

Condition: 3 Is Selected. Skip To: .

Condition: 4 or more Is Selected. Skip To: .

Page Break

P9

How many dog(s) did you own in the last three years?

- 1
- 2
- 3
- 4 or more

Condition: 1 Is Selected. Skip To: .

Condition: 2 Is Selected. Skip To: .

Condition: 3 Is Selected. Skip To: .

Condition: 4 or more Is Selected. Skip To: .

Page Break

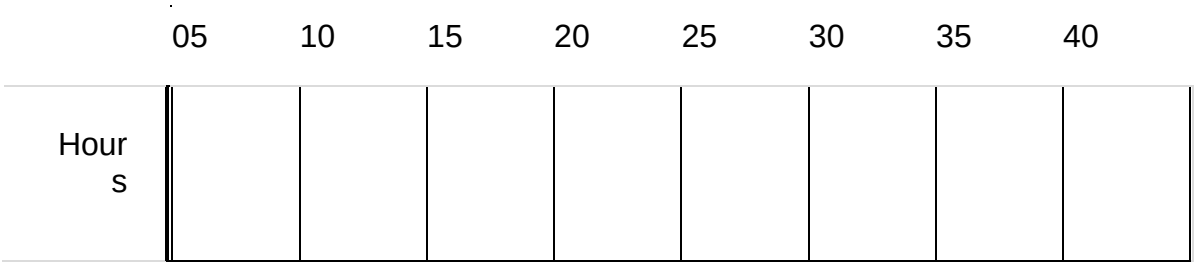
P10

How many cat(s) and dog(s) did you own in the last three years?

Cat(s)	
Dog(s)	

Page Break

P11



Page Break

P11

Please read the following statements carefully and tick the box that fits best.

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I miss my pet(s) when it is not around me.	○	○	○	○	○
I am happy when I am with my pet(s).	○	○	○	○	○
I like to spend time with my pet(s).	○	○	○	○	○
I consider my pet(s) as part of the family.	○	○	○	○	○

Page Break

End

Thank you for participating.

The purpose of this study is to investigate the effects of owning a pet on general self-efficacy and perceived stress.

In case you want to withdraw at this moment, close the webpage.

If you want to end the survey, press the 'next' button below.

For any further questions please contact: j.h.a.tenberge@student.utwente.nl

Appendix B

Perceived Stress Scale

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

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References

The PSS Scale is reprinted with permission of the American Sociological Association, from Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24,* 386-396.
Cohen, S. and Williamson, G. Perceived Stress in a Probability Sample of the United States. Spacapan, S. and Oskamp, S. (Eds.) *The Social Psychology of Health.* Newbury Park, CA: Sage, 1988.

Appendix C

Factor loadings of the Perceived Stress Scale

Factor loadings and item statistics

Measures	Factor loadings		Item statistics	
Perceived Stress	I	II	Mean	SD
PSS_1	.76		1.69	1.14
PSS_2	.65	.41	1.61	1.21
PSS_3	.79		1.55	1.19
PSS_4		.80	2.08	1.09
PSS_5	.39	.67	1.66	1.11
PSS_6	.57	.36	1.92	1.10
PSS_7		.74	1.93	1.02
PSS_8		.71	1.53	1.00
PSS_9	.74		1.65	1.16
PSS_10	.61	.36	2.08	1.13
Variance explained	57%			

* Note: PSS_1-10 are the items of the Perceived Stress Scale