

The relationship between pet attachment, perceived stress and life satisfaction: An online survey

Simonne Wright



Thesis presented in fulfilment of the requirements for the degree of a
Master of Arts in the Faculty of Arts and Social Sciences (Psychology) at

Stellenbosch University

UNIVERSITEIT
STELLENBOSCH
UNIVERSITY

100
1918 · 2018

Supervisor: Dr. Marieanna le Roux

March 2018

DECLARATION

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third-party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Date: March 2018

Copyright © 2018 Stellenbosch University

All rights reserved

ABSTRACT

International research on pet ownership has found a wide array of physical, psychological and social benefits as a result of human-animal interaction (HAI) (Beetz, Uvnäs-Moberg, Julius, & Kotrschal, 2012). In spite of South Africa's declining economic situation, South Africa has a flourishing pet care market (Maharaj, 2017). By gaining literature in South Africa on pet ownership and pet attachment, we can gain greater insight into the nature of this complex relationship.

The current study used a quantitative, survey design to investigate whether there is a relationship between pet attachment, perceived stress, and life satisfaction in South African pet owners. It also investigated whether there is a difference in perceived stress and life satisfaction between South African pet owners and non-pet owners. Additional exploratory analyses were conducted to determine if pet attachment, perceived stress, and life satisfaction differed according to age, gender, marital status, and type of pet.

As a preliminary step, a pilot study was conducted. The pilot study sample comprised of 59 South African adults. The respondents were mostly white (89.8%), female (55.9%) pet owners (76.3%). The Cronbach's alphas were calculated for all three standardised questionnaires used in the survey. Both versions of the CCAS, PSS and SWLS were found to have a high degree of internal reliability.

Data was collected by means of an online survey, which was distributed using Facebook and electronic mail. The survey included a demographical and pet ownership questionnaire, and three standardised self-report measures, namely the Comfort from Companion Animal Scale (CCAS), Perceived Stress Scale (PSS), and Satisfaction With Life Scale (SWLS).

The main study sample comprised of 3 329 South African adults. The respondents were mostly white (92.7%), female (86.5%) pet owners (97.7%). Pearson's correlations and one-way ANOVAS were then used to address the

research questions and additional exploratory analyses. Effect size, using Cohens d (d) was calculated for all significant between group differences. The coefficient of determination (r^2), was calculated for all significant relationships.

Findings in the present study do not support the notion that pet attachment is directly related to perceived stress or life satisfaction in South African pet owners. Additionally, no significant difference was found between pet owners and non-pet owners in terms of perceived stress and life satisfaction. The additional exploratory analysis found that age was related to pet attachment, perceived stress, and life satisfaction. It also found significant differences in pet attachment, perceived stress, and life satisfaction between groups based on gender, marital status, and type of pet owned.

The current study contributes to filling a gap in South African literature, with regards to pet ownership, pet attachment, perceived stress, and life satisfaction. However, there is still a need for further investigation of pet ownership and attachment within a South African context in order to gain a better understanding of this complex relationship.

Keywords: pet ownership; pet attachment; human-animal interaction; human-animal bond; companion animal; online survey; perceived stress; life satisfaction; subjective well-being.

OPSOMMING

Internasionale navorsing oor troeteldier-eienaarskap bevind 'n wye reeks fisieke, sielkundige en sosiale voordele weens mens-dier-interaksie (MDI) (Beetz et al., 2012). Ongeag die agteruitgang in Suid-Afrika se ekonomiese situasie, het die land 'n florende troeteldier-versorgingsmark (Maharaj, 2017). Deur die insameling van literatuur oor troeteldier-eienaarskap en -gehegtheid, kan daar groter insig ingewin word oor die aard van hierdie komplekse verhouding.

Die onderhawige studie het 'n kwantitatiewe opnameontwerp gebruik om na te vors of daar 'n verhouding is tussen troeteldier-gehegtheid en lewenstevredenheid by Suid-Afrikaanse troeteldier-eienaars. Dit het ook ondersoek ingestel of daar 'n verskil is in waargenome stres en lewenstevredenheid tussen Suid-Afrikaanse troeteldier-eienaars en nie-troeteldier-eienaars. Daar is verder 'n eksploratiewe analise uitgevoer om vas te stel of eenaar-gehegtheid, waargenome stres en lewenstevredenheid verskil ooreenkomstig ouderdom, geslag, huwelikstatus en soort troeteldier.

As 'n voorlopige stap is 'n loodsondersoek uitgevoer. Die loodsondersoek-steekproef het bestaan uit 59 volwasse Suid-Afrikaners. Die respondente was hoofsaaklik wit (89.8%), vroulik (55.9%) en troeteldier-eienaars (76.3%). Die Cronbach-alfas is beraam vir al drie gestandaardiseerde vraelyste wat in die opname gebruik is. Albei die weergawes van die CCAS, PSS en SWLS het 'n hoë mate van interne betroubaarheid getoon.

Data is ingesamel by wyse van 'n aanlynopname wat versprei is deur middel van Facebook en elektroniese pos. Die opname het 'n demografiese eienaarsvraelys ingesluit en ook drie gestandaardiseerde selfverslagmetings, naamlik die Troos-vanaf-troeteldierskaal (CCAS), Waargenomestresskaal (PSS) en die Lewenstevredenheidskaal (SWLS).

Die hoofstudiesteekproef het bestaan uit 3 329 Suid-Afrikaanse volwassenes. Die respondente was hoofsaaklik wit (92.7%), vroulik (86.5%) en

troeteldier-eienaars (97.7%). Pearson-korrelasies en eenrigting-ANOVA's is hierna gebruik om die navorsingsvrae en bykomende ondersoekende analises te hanteer. Effekgrootte is beraam met behulp van die Cohen d (d) vir alle beduidende tussengroep-verskille. Die bepalingkoëffisiënt (r^2) is bepaal vir alle beduidende verhoudings.

Bevindinge in die onderhawige studie ondersteun nie die opvatting dat troeteldier-gehegtheid direk verband hou met waargenome stres of lewensbevrediging by Suid-Afrikaanse troeteldier-eienaars nie. Bykomend is daar geen beduidende verskil waargeneem nie tussen troeteldier-eienaars en nie-troeteldier-eienaars ooreenkomstig waargenome stres en lewensvredigheid. Die bykomende eksploratiewe analise het bevind dat ouderdom verband hou met troeteldier-gehegtheid, waargenome stres en lewensvredigheid. Dit het ook beduidende verskille bevind betreffend troeteldier-gehegtheid, waargenome stres en lewensvredigheid tussen groepe gebaseer op geslag, huwelikstatus en soort troeteldier wat besit is.

Die onderhawige studie dra daartoe by om 'n gaping te vul in Suid-Afrikaanse literatuur betreffende troeteldier-eienaarskap, troeteldier-gehegtheid, waargenome stres en lewensvredigheid. Daar is egter steeds 'n behoefte aan verdere navorsing oor troeteldier-eienaarskap en -gehegtheid binne 'n Suid-Afrikaanse konteks met die doel om 'n beter begrip te vorm van hierdie komplekse verhouding.

Trefwoorde: troeteldier-eienaarskap ('pet ownership'); troeteldier-gehegtheid ('pet attachment'); mens-dier-interaksie ('human-animal interaction'); mens-dier-band ('human-animal bond'); geselskapsdier ('companion animal'); aanlynopname ('online survey'); waargenome stres ('perceived stress'), lewensvredigheid ('life satisfaction') en subjektiewe welwees ('subjective well-being').

ACKNOWLEDGEMENTS

Firstly, I would like to thank my supervisor, Dr. M. C. Le Roux, for her patience, guidance, and support. I have learnt more under your supervision than I could have ever imagined. I feel truly blessed to have had you as my supervisor.

Secondly, I would like to thank J. du Toit for translating my questionnaires and editing my proposal. I would also like to thank R. Engelbrecht for editing my thesis. Both editors provided invaluable feedback.

Thirdly, I would like to thank Prof M. Kidd for your assistance with my data analysis.

Fourthly, I would like to thank my parents. My mother, Larnay Wright, for always being there for me when I need you, the late-night talks, and your incredible food (and study "nibbles"). My father, Garth Wright, for always making my problems feel manageable and supporting me throughout my academic journey. You drive me to constantly strive to be a better version of myself.

Lastly, I would like to thank my friends. Francois Conradie, Vicky-lee Prinsloo, and Jacky Woudberg. Each of you brighten my life in ways I cannot express. Thank you all for your patience and understanding throughout this journey. You all make my world a brighter place in different ways.

TABLE OF CONTENTS

| | |
|--|-------------|
| DECLARATION | II |
| ABSTRACT..... | III |
| OPSOMMING..... | V |
| ACKNOWLEDGEMENTS | VII |
| LIST OF TABLES | XII |
| LIST OF APPENDICES..... | XIII |
| LIST OF ABBREVIATIONS | XIV |
| CHAPTER 1: INTRODUCTION AND MOTIVATION..... | 1 |
| 1.1 INTRODUCTION..... | 1 |
| 1.2 RATIONALE..... | 3 |
| 1.3 RESEARCH QUESTIONS | 6 |
| 1.4 DEFINITIONS OF KEY CONCEPTS | 6 |
| 1.4.1 <i>Human-animal Interaction (HAI)</i> | 6 |
| 1.4.2 <i>Animal-assisted intervention (AAI)</i> | 7 |
| 1.4.3 <i>Animal-assisted therapy (AAT)</i> | 7 |
| 1.4.4 <i>Animal-assisted activities (AAA)</i> | 7 |
| 1.4.5 <i>Human-animal Bond (HAB)</i> | 7 |
| 1.4.6 <i>Pet and companion animal</i> | 8 |
| 1.4.7 <i>Pet attachment</i> | 8 |
| 1.4.8 <i>Perceived stress</i> | 8 |
| 1.4.9 <i>Life satisfaction (Subjective well-being)</i> | 8 |
| 1.5 THESIS LAYOUT | 9 |
| 1.6 CHAPTER SUMMARY..... | 10 |
| CHAPTER 2: LITERATURE REVIEW | 11 |
| 2.1 INTRODUCTION | 11 |
| 2.2 HUMAN-ANIMAL INTERACTION (HAI)..... | 11 |
| 2.2.1 <i>Physical benefits of HAI</i> | 12 |

| | |
|--|-----------|
| 2.2.2 Psychological benefits | 14 |
| 2.2.3 Social benefits..... | 16 |
| 2.3 PET ATTACHMENT | 18 |
| 2.3.1 Factors associated with pet attachment..... | 19 |
| 2.4 PERCEIVED STRESS..... | 22 |
| 2.4.1 Factors associated with perceived stress | 24 |
| 2.5 LIFE SATISFACTION..... | 27 |
| 2.5.1 Factors associated with satisfaction of life | 28 |
| 2.6 PERCEIVED STRESS, SATISFACTION WITH LIFE AND HAI | 33 |
| 2.7 CHAPTER SUMMARY..... | 36 |
| CHAPTER 3: THEORETICAL FRAMEWORK | 37 |
| 3.1 INTRODUCTION | 37 |
| 3.2 BIOPHILIA HYPOTHESIS..... | 37 |
| 3.3 ATTACHMENT THEORY | 40 |
| 3.4 SOCIAL SUPPORT THEORY..... | 41 |
| 3.5 CHAPTER SUMMARY..... | 43 |
| CHAPTER 4: PILOT STUDY | 44 |
| 4.1 INTRODUCTION | 44 |
| 4.2 RESPONDENTS | 44 |
| 4.3 DATA COLLECTION | 47 |
| 4.4 STATISTICAL ANALYSIS..... | 47 |
| 4.4.1 Limitations..... | 47 |
| 4.5 RESULTS | 48 |
| 4.6 CHAPTER SUMMARY..... | 48 |
| CHAPTER 5: METHODOLOGY: MAIN STUDY | 49 |
| 5.1 INTRODUCTION | 49 |
| 5.2 HYPOTHESES..... | 49 |
| 5.3 RESEARCH DESIGN | 50 |
| 5.4 RESPONDENTS | 51 |
| 5.4.1 Description of the respondents | 52 |

| | |
|---|-----------|
| 5.5 QUESTIONNAIRES | 55 |
| 5.5.1 Demographic questionnaire | 56 |
| 5.5.2 Comfort from Companion Animal Scale (CCAS) | 56 |
| 5.5.3 Perceived Stress Scale (PSS-10) | 58 |
| 5.5.4 Satisfaction with Life Scale (SWLS)..... | 59 |
| 5.6 DATA COLLECTION | 60 |
| 5.6.1 Survey creation | 60 |
| 5.6.2 Survey distribution..... | 60 |
| 5.6.3 Survey respondent procedure..... | 61 |
| 5.7 STATISTICAL ANALYSIS | 62 |
| 5.7.1 Interpreting the results..... | 63 |
| 5.8 ETHICAL CONSIDERATION..... | 64 |
| 5.8.1 Informed consent | 64 |
| 5.8.2 Anonymity and confidentiality | 64 |
| 5.9 CHAPTER SUMMARY..... | 65 |
| CHAPTER 6: RESULTS | 66 |
| 6.1 INTRODUCTION | 66 |
| 6.2 THE RELATIONSHIP BETWEEN PET ATTACHMENT, PERCEIVED STRESS, AND LIFE SATISFACTION | 66 |
| 6.3 DIFFERENCE IN PERCEIVED STRESS AND LIFE SATISFACTION BETWEEN PET OWNERS AND NON-PET OWNERS..... | 67 |
| 6.4. ADDITIONAL ANALYSIS..... | 68 |
| 6.4.1 Age..... | 68 |
| 6.4.2 Gender | 68 |
| 6.4.3 Marital status..... | 69 |
| 6.4.4 Pet type..... | 74 |
| 6.5 CHAPTER SUMMARY..... | 75 |
| CHAPTER 7: DISCUSSION, LIMITATIONS AND RECOMMENDATIONS | 76 |
| 7.1 INTRODUCTION | 76 |
| 7.2 SUMMARY OF THE STUDY..... | 76 |

| | |
|---|------------|
| 7.3 DISCUSSION OF THE RESULTS | 78 |
| 7.3.1 <i>The relationship between pet attachment, perceived stress, and life satisfaction</i> | 78 |
| 7.3.2 <i>Difference in perceived stress and life satisfaction between pet owners and non-pet owners</i> | 81 |
| 7.3.3 <i>Additional analysis</i> | 83 |
| 7.4 LIMITATIONS AND RECOMMENDATIONS..... | 89 |
| 7.4.1 <i>Strengths</i> | 89 |
| 7.4.2 <i>Limitations</i> | 90 |
| 7.4.3 <i>Recommendations</i> | 91 |
| 7.5 CONCLUSION | 92 |
| REFERENCES | 94 |
| APPENDIX A | 132 |
| APPENDIX B | 136 |
| APPENDIX C | 144 |
| APPENDIX D | 150 |
| APPENDIX E..... | 158 |
| APPENDIX F..... | 164 |
| APPENDIX G..... | 165 |

LIST OF TABLES

| | | |
|-----------|--|----|
| Table 4.1 | Demographic Characteristics of the Pilot Study Respondents ($N = 59$) | 45 |
| Table 4.2 | Pet Ownership Information of the Pilot Study Respondents ($N = 59$) | 46 |
| Table 5.1 | Demographic Characteristics of the Respondents ($N = 3329$) | 53 |
| Table 5.2 | Pet Ownership Information of the Respondents ($N = 3329$) | 55 |
| Table 6.1 | Results of the Pearson Correlations for the CCS, PSS, and SWLS of the Pet Owner ($n = 3184$) | 66 |
| Table 6.2 | Means(M) and Standard Deviations (SD) of the PSS and SWLS scores for the Pet Owners, Non-Pet Owners, and the Total Sample ($N = 3329$) | 67 |
| Table 6.3 | Results of the Pearson Correlations for Age and the CCS, PSS, and SWLS ($N = 3329$) | 68 |
| Table 6.4 | Results of the One-Way ANOVA for the Gender Difference on the CCAS, PSS and SWLS ($N = 3329$) | 69 |
| Table 6.5 | Results of the One-Way ANOVA for the Marital Status Differences on the CCAS, PSS and SWLS ($N = 3329$) | 70 |
| Table 6.6 | Results of the LSD Post-Hoc for Marital Status Differences on the CCAS ($n = 3184$) | 71 |
| Table 6.7 | Results of the LSD Post-Hoc for Marital Status Differences on the PSS ($N = 3329$) | 72 |
| Table 6.8 | Results of the LSD Post-Hoc for Marital Status Differences on the SWLS ($N = 3329$) | 73 |
| Table 6.9 | Results of the One-Way ANOVA for the Type of Pet Differences on the CCAS, PSS and SWLS ($n = 3184$) | 74 |

LIST OF APPENDICES

| | | |
|------------|--|-----|
| Appendix A | Digital consent form | 132 |
| Appendix B | Demographical questionnaire | 136 |
| Appendix C | Comfort from Companion Animal Scale (CCAS) (English and Afrikaans) | 144 |
| Appendix D | Perceived Stress Scale (PSS) (English and Afrikaans) | 150 |
| Appendix E | Satisfaction With Life Scale (SWLS) (English and Afrikaans) | 158 |
| Appendix F | Permission to use the CCAS | 164 |
| Appendix G | Ethical clearance from the Research Ethics Committee | 165 |

LIST OF ABBREVIATIONS

| | |
|------|-------------------------------------|
| HAI | Human-animal interaction |
| AAI | Animal-assisted intervention |
| AAT | Animal-assisted therapy |
| AAA | Animal-assisted activity |
| HAB | Human-animal bond |
| CCAS | Comfort from Companion Animal Scale |
| PSS | Perceived Stress Scale |
| SWLS | Satisfaction With Life Scale |

CHAPTER 1: INTRODUCTION AND MOTIVATION

1.1 INTRODUCTION

South Africa is plagued by political and economic instability, a high violent-crime rate, unemployment and poverty, which makes stress an unavoidable part of daily life (Booyesen & Botha, 2012). Past research highlights the urgent need for cost-effective strategies for reducing stress and improving life satisfaction among all cohorts of South Africans (Hamad, Fernald, Karlan, & Zinman, 2008). Hamad et al. (2008) found perceived stress to be a public health concern in a diverse sample of South African adults. They concluded that low income South Africans are at high risk of perceived stress.

A large number of physical and psychological disorders have been linked to high stress levels (American Institute of Stress [AIS], 2017). High perceived stress is linked to depression, anxiety, lower self-esteem, and a negative perception of their health (American College Health Association, 2015). High perceived stress is also related to chronic illnesses such as obesity, heart disease, Alzheimer's disease, diabetes, gastrointestinal problems, herpes and cancer (AIS, 2017; Griffin, 2010). The negative effects of stress on employees in the work place has been well documented in South Africa (Steyn & Vawda, 2014; Van der Colff & Rothmann, 2014). High perceived stress is associated with high staff turnover, low productivity, burnout, absenteeism, impaired performance and poor customer service (Steyn & Vawda, 2014; Van der Colff & Rothmann, 2014).

In recent years, well-being and positive mental health have been the focus of research, rather than pathology (Seligman & Csikszentmihalyi, 2000; Stenseng & Phelps, 2013; Veenhoven, 2008). The emergence of positive psychology has highlighted the need to also evaluate positive aspects of mental health (Strumpfer, 2006). The beneficial effect life satisfaction has is just as strong as the negative effect of smoking on longevity (Steptoe & Wardle, 2012; Veenhoven, 2008). Happier people have been found to be more successful in their personal and work-related lives (Lyubomirsky, King, &

Diener, 2005). The researchers suggested that this can be attributed to these people being more engaging and committed in the various aspects of their lives (Lyubomirsky et al., 2005).

Human-animal interaction (HAI) has occurred throughout history, across the translucent partition of culture. Archaeological evidence of the human-animal bond (HAB) dates back to as early as 10,000 to 15,000 years ago in different cultures across the globe (Lear, 2012). Genetic evidence suggests that the relationship between humans and dogs has existed for more than 32,000 years (Wong, 2013). Historical graves are one source of this evidence. Many graves have been unearthed in which animals are buried with care among humans, such as Germany, Israel, Cyprus, Egypt, to name a few (Budiansky, 1992; Debue, Gerard, Guilaine, Haye, & Vigne, 2004; Morey, 2006; Tchernov & Valla, 1996). Another source of this evidence are the ornaments, paintings, and literature, that date back to as early as 10, 200 BC. Animal epitaphs revealed that not only did the Greeks and Romans have pets, but also that they considered these animals to be companions (Bodson, 2000). A well-known example is the ancient Egyptians, who are renowned for having domesticated cats which they valued highly (Council for Science and Society, 1998). Similar evidence of such a bond exists in South Africa. Vasco Da Game observed that the San, the indigenous inhabitants of Southern Africa, owned dogs (Berens, Boonzaier, Malherbe, & Smith, 1996). This is consistent with reports in 1595, of Khoisan keeping domesticated dogs (Raven-Hart, 1967).

The scientific field overlooked the HAB until Friedmann, Katcher, Lynch, and Thomas (1980) studied a sample of coronary heart disease patients and found pet owners to be significantly more likely than non-pet owners to survive one year after they were discharged from hospital. This ignited an international interest in this complex relationship. Since then we have started to gain insight into the physical, psychological and social benefits these relationships can have on people's lives (Horowitz, 2008).

In modern society, pets serve no significant utilitarian value but are rather kept for companionship purposes. Many pet owners consider their pets as part of the family, which is clear from the great deal of time, money and energy so many people spend on their pets (Adrian, Deliramich, & Frueh, 2009; Hunt & Padilla, 2006; Kaufman & Kaufman, 2006; Levin & Trost, 1992). It is widely believed among pet owners that their pets have a beneficial effect on them (Amiot & Bastian, 2015).

This strong attachment people form with their pets is also evident in their experience of the death of a pet. The loss of a pet can cause a pet owner to experience bereavement and grieving (Al-Awadi, Hunt, & Johnson, 2008). Emotions such as guilt, anger, and sadness are also commonly experienced by grieving pet owners (Kübler-Ross & Kessler, 2005). Pet loss is also related to difficulties concentrating and sleeping, reduced appetite, and dissociation (Kübler-Ross & Kessler, 2005). These experiences are similar to those experienced following the death of friends and family (Adrian et al., 2009).

According to the South African Pet Care (Dog) Industry Landscape Report 2017, there are roughly 9.2 million pet dogs in South Africa (Maharaj, 2017). In spite of South Africa's poor economic situation, South Africans spend R5 billion a year on pet food alone (Maharaj, 2017). This suggests that pets are an important part of many South Africans' lives. Research on pet ownership in South Africa has found that people of all cultures, income groups and ages care for their pets (Spicer, 2012).

1.2 RATIONALE

There is extensive evidence that suggests that pets can have a beneficial effect on a person's life (Wells, 2009). Most of the past research on HAI is from developed countries which effects the potential generalisability of the findings in a developing country like South Africa (Andreassen, Rudmin, & Stenvold, 2013; Mikulincer, Shaver, & Zilcha-Mano, 2011; Netting et al., 2013). While past research has found benefits as a result of HAI, there are studies

that have either found no significant relationship or found an inverse relationship (Antonacopoulos & Pychyl, 2010; Wells, 2009; Wisdom, Saedi, & Green, 2009). These inconsistent results could be due to a number of methodological differences and potential problems, which make comparisons difficult. These include sample size, homogeneous samples and vulnerable populations, different variables used to assess HAI/HAB, and different questionnaires used to assess the same constructs.

A great deal of the literature has concentrated on the benefits of HAI on vulnerable populations, for example, psychiatric patients, hospitalised patients, and the elderly (Berget, Ekeberg, & Braastad, 2008; Cole, Gawlinski, Steers, & Kotlerman, 2007; Colombo, Buono, Smania, Raviola, & DeLeo, 2007; Kramer, Friedmann & Bernstein, 2009; Villalta-Gil, Roca, Gonzalez, & Domenee, 2009). Previous research in South Africa on HAI has focused on subgroups of the population which has resulted in a variety of relatively small, homogeneous samples from the South African population (Buckle, 2015; Coetzee, Beukes, & Lynch, 2013). Samples being selected from subgroups of the population, such as elderly residents in a nursing home, limits the generalisability and comparability of the findings. However, they do provide a better good look at the direct impact of HAI in specific populations (Buckle, 2015; Le Roux, Swart, & Swart, 2014).

Additionally, there are a large number of questionnaires measuring a variety of different variables related to HAI, as well as a number of different ways of assessing each. Anderson (2007) provides a comprehensive collection of different questionnaires that asses a variety of the same and different aspects of the HAB. Some assess pet owners' attachment, bonding, attitudes, behaviour towards animals, pet responsibility, pet expectations and pet quality of life. This makes comparison of previous literature more difficult because different variables have been assessed.

A potential problem in pet-ownership research is that a great deal of the research focuses on pet ownership, and hasn't taken the participants pet attachment or attitude into consideration (Chur-Hansen, Peacock, &

Winefield, 2012). Not all pet owners necessarily have a close bond with their pet. The relationship can range from dysfunctional, where people may neglect or abuse their pet, to being a highly supportive, caring relationship (Anderson, Lord, Hill, & McCune, 2015).

Another possible explanation for this contradictory evidence is that these benefits are not a direct result of one specific cause. The benefits can be attributed to the support and comfort a person receives from their pet or therapy animal (Cohen, Gottlieb, & Underwood, 2000). The benefits have also been attributed to the satisfaction of an innate desire to connect with other living things (Bjick, 2013; Fine & Beck, 2010). While the research on HAI in SA is increasing, the literature focuses mainly on the benefits of animal-assisted interaction (AAI) (Buckle, 2015; Le Roux & Kemp, 2009; Le Roux, Swartz, & Swart, 2014; Lubbe & Scholtz, 2013; Odendaal, 2000). There is still very limited research on pet ownership and attachment within a South African context (Gerber, 2016).

A possible reason why research on pet ownership and attachment in South Africa is limited is because there are ethical barriers around conducting experimental research on pet ownership. It would be unethical to randomly assign a pet to a sample of non-pet owners (Siegel, 2011). It could also be very difficult to conduct a longitudinal study, collecting data from participants prior to and post pet adoption.

Surveys are a very effective way of collecting data from a large group of people, allowing researchers to address specific research questions. They also offer an opportunity for exploratory analysis which can highlight potential variables of interest for future research (Trei, 2006).

By gaining literature in South Africans using a variety of different research designs based on rigorous methodological procedures, we can gain greater insight into the nature of this complex relationship. This advocates a need for a greater understanding of pet ownership and attachment in South Africa from larger samples of the general population. This study used a survey research design to advance the knowledge of pet ownership and

attachment, perceived stress and life satisfaction within a South African context.

This research study investigated whether there was a significant relationship between pet attachment, life satisfaction, and perceived stress in a sample of South Africans. The researcher also investigated the possible differences in life satisfaction, and perceived stress, between pet owners and non-pet owners.

1.3 RESEARCH QUESTIONS

The research questions refer to the specific questions that the study sets out to answer, which are derived from the aim of the study (Neuman, 2014).

The primary research question was: *Is there a relationship between pet attachment, perceived stress, and life satisfaction in a sample from the South African population?*

The secondary research question was: *Is there a difference in perceived stress and life satisfaction between pet owners and non-pet owners in a sample from the South African population?*

Additional analyses aimed to determine whether pet attachment, perceived stress, and life satisfaction are influenced by age, gender, marital status, and type of pet owned.

1.4 DEFINITIONS OF KEY CONCEPTS

This section provides the operational definition of the main constructs being investigated in this study, namely HAI, HAB, pet/ companion animal, pet attachment, perceived stress, and life satisfaction.

1.4.1 Human-animal Interaction (HAI)

HAI is a broad term that involves any situation in which an animal and human interact (American Veterinary Medical Foundation [AVMA], 2017). This interaction can be brief or occur over a period of time (AVMA, 2017). In relation to the present study, animal refers specifically to domesticated and

tame animals, but not wild animals. This study specifically focuses on HAI in the context of pet ownership and AAI.

1.4.2 Animal-assisted intervention (AAI)

AAIs are purposeful, goal orientated activities which incorporate animals as part of an intervention in order to enhance its effectiveness (AVMA, 2017). AAI is also commonly referred to as pet therapy, pet-facilitated therapy, animal-facilitated counselling, companion-animal therapy, and co-therapy with an animal (LaJoie, 2003). According to Fine and Beck (2010), AAI's are classified into three subtypes, namely animal-assisted therapy (AAT), animal-assisted activities (AAA), and animal-assisted education (AAE). Two subtypes of AAI are referred to in this thesis, namely AAT and AAA.

1.4.3 Animal-assisted therapy (AAT)

AAT involves a qualified healthcare professional who is accompanied by trained therapy animals (Kruger & Serpell, 2010). The healthcare professional is required to be practising within their area of expertise (Kruger & Serpell, 2010). The interventions are formal in that the progress is formally assessed, with specific goals in mind (Fine & Beck, 2010). These goals include the enhancement of physical, psychological, emotional and social aspects of human functioning (Fine & Beck, 2010).

1.4.4 Animal-assisted activities (AAA)

AAA are less formal interventions offered by trained companion animals and their handlers, who offer educational, recreational and therapeutic benefits (Kruger & Serpell, 2010). AAA differs from AAT in three ways (AVMA, 2017). Firstly, it is delivered by a volunteer rather than a qualified healthcare professional. Secondly, specific goals and assessment methods are not required. Thirdly, the activity is unplanned.

1.4.5 Human-animal Bond (HAB)

The HAB is a beneficial, multidimensional relationship that occurs between people and animals (AMVA, 1998). Russow (2002) suggested three features for distinguishing the HAB from other kinds of relationships: Firstly, it occurs

between a person and an animal. Secondly, the relationship is reciprocal in nature, as well as persistent. Thirdly, the relationship has a beneficial effect on both parties.

1.4.6 Pet and companion animal

Grier (2006) regards the two terms 'pet' and 'companion animal' as being synonymous. A pet is an animal that a person chooses to take care of (Chur-Hansen, Stern, & Winefield, 2010). They are either domesticated or tame and are kept for companionship rather than for utilitarian purposes. Animals that are usually kept as pets are dogs, cats, fish, birds, guinea pig, rabbits, rodents and reptiles (American Society for the Prevention of Cruelty to Animals, 2015).

1.4.7 Pet attachment

Pet attachment refers to a close, emotional bond between a human and an animal which provides emotional and physical support (Bowlby, 1977). This bond forms the basis of an emotional relationship (Zasloff, 1996). In the present study, pet attachment is measured by assessing the degree of emotional comfort the owner reports to experience (Zasloff, 1996). Strong pet attachment bonds are characterised by love, affection, support and relief from emotional distress (Field, Orsini, Gavish, & Packman, 2009; Noonan, 2008).

1.4.8 Perceived stress

According to Lazarus and Folkman (1984), perceived stress is "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being (p.19)". In other words, perceived stress measures how stressful a person perceives their life.

1.4.9 Life satisfaction (Subjective well-being)

Life satisfaction refers to how people perceive their lives, involving both their cognitive and affective dimensions (Diener & Chan, 2011). Life satisfaction only takes into account a person's subjective evaluation of their life (Diener &

Chan, 2011). The terms life satisfaction, subjective well-being, and happiness are synonymous (Diener & Diener, 2008).

1.5 THESIS LAYOUT

This thesis is organised into seven chapters. Chapter 1 provided an introduction to the study, rationale, research questions, and definitions of the key concepts of the study.

Chapter 2 presents a review of the literature relevant to the present study. This includes a discussion of HAI and the benefits, pet attachment, perceived stress, and life satisfaction. The relationship between perceived stress, life satisfaction and HAI is then addressed.

Chapter 3 presents the theoretical framework. This will include a discussion of the three main theories used to explain HAI and their application.

Chapter 4 describes the methodology used in the pilot study. A description of the pilot study respondents, data collection, statistical analyses and results will be presented.

Chapter 5 describes the methodology used in the main study. The research hypotheses are presented. This is followed by a description of the research design, respondents, questionnaires, data collection, statistical analyses, and the ethical considerations undertaken in this study.

Chapter 6 presents the study's findings. This includes the results of the data analyses that addressed the research questions. The results of the additional analyses are then presented.

Chapter 7 provides a discussion of the study and its findings. The limitations and recommendations for future research are then presented.

1.6 CHAPTER SUMMARY

This chapter covered the introduction, rationale, and the research questions of the present study. The definitions of the key concepts were also defined, followed by the thesis layout. Chapter 2 provides an overview of the literature relevant to this study.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter an overview of the literature on HAI and its potential physical, psychological and social benefits is discussed. This is followed by a discussion on pet attachment, perceived stress and life satisfaction. The literature on the relationship between these variables has also been considered.

The purpose of a literature review is to improve the researcher's own understanding of the variables surrounding the research questions, to ensure that the study will fill a gap in the current literature, and inform the reader about the topic at hand (Neuman, 2014). The majority of the sources used in this literature review were peer-reviewed journal articles, which are the most accurate and objective form of literature (Neuman, 2014). Other sources include non-fiction books, academic books, and dissertations (Neuman, 2014). The literature was collected using large data bases, such as EBSCOhost Sabinet, ProQuest, JSTOR, PsycARTICLES, and Taylor & Francis Journals. The literature search used keywords directly relevant to the research questions, for example 'pet ownership', 'pet attachment', 'companion animal', 'human-animal bond', 'human-animal interaction', 'perceived stress', 'subjective well-being', and 'life satisfaction'.

2.2 HUMAN-ANIMAL INTERACTION (HAI)

The potential benefits of HAI have been well documented not only regarding pet owners but also in AAI (Vitztum, 2012). The relationship that forms can provide socialisation, physical security, as well as psychological and social support (Horowitz, 2008). The beneficial effect of HAI has been well documented across various domains, and across a wide variety of populations (Beetz et al., 2012). Ranging from beneficial physiological changes in the body, reduced perception of stress, increased physical activity, mental health improvements, and social support (Allen, Barker, & Friedmann, 2011; Cohen et al., 2000; Hill, Gaines, & Wilson, 2008).

2.2.1 Physical benefits of HAI

Past research in the USA, Sweden, Japan and South Africa has found neurological evidence for the benefits of HAI (Handlin et al., 2011; Miller et al., 2009; Nagasawa, Kikusui, Onaka, & Ohta, 2008; Odendaal, 2000). These studies found a significant increase in pet owners' oxytocin levels after interacting with a pet dog in comparison to the pre-interaction scores. The study by Nagasawa et al. (2008) differed from the other three studies in that they assessed urinary oxytocin levels rather than blood oxytocin levels, and no control groups were used. The study by Miller et al. (2009) was the only one to assess the men and women in both the test and control groups separately. A significant increase was found in the oxytocin levels of the female pet owners after 25 minutes of interacting with their pet dog in comparison to the females in the reading control group. No difference was found in the scores of the men in either the intervention or control groups.

Furthermore, interacting with a pet can cause beneficial changes in other hormones such as cortisol, B-endorphin, prolactin, and dopamine (Handlin et al., 2011; Odendaal & Meintjies, 2003). HAI has been associated with pain reduction (Coakley & Mahoney, 2009; Sprouse-Blum, Smith, Sugai, & Parsa, 2010). Coakley and Mahoney (2009) reported a significant decrease in participants' pain after a therapy dog's visit when compared to their baseline scores. This was attributed to a potential increase in B-endorphin which triggers an almost morphine-like effect by binding to opioid receptors (Sprouse-Blum et al., 2010). An increase in this hormone is associated with reduced pain (Sprouse-Blum et al., 2010). Other international studies have confirmed the pain reducing effect of AAT in medical patients (Engelman, 2013; Marcus, 2013; Nepps, Stewart, & Bruckno, 2014),

Interacting with one's pet has been found to significantly reduce blood pressure and heart-rate in controlled and field experiments (Barker, Knisley, McCain, Schubert, & Pandurangi, 2010; Friedmann, Thomas, Son, Chapa, & McCune, 2013; Handlin et al., 2011). In South Africa, Odendaal and Meintjies

(2003) reported a significant reduction in blood pressure after 5 to 24 minutes of positive interaction with a pet dog.

Recent research on the effects of AAI on blood pressure and heart-rate have yielded conflicting results in comparison to the previously mentioned studies on people's interaction with pets (Cole et al., 2007; Lass-Hennemann, Peyk, Streb, Holz & Michael, 2014). The study by Cole et al. (2007) found no significant difference in blood pressure and heart-rate after AAI in comparison to the pre-interaction scores. The sample consisted of elderly hospitalised heart-failure patients in the USA. The researchers suggested the participants medication may have affected blood pressure response. Another important point to note is that the changes in blood pressure may have been blunted because of the patients' severe cardiac condition (Cole et al., 2007). Similarly, in Germany, Lass-Hennemann et al. (2014) found no significant difference in blood pressure and heart-rate between the dog group and the control groups after an induced stressor.

Dog-walking is a type of physical activity that can have a beneficial effect on human health (Campbell, Smith, Tumilty, Cameron, & Treharne, 2016). Increased physical activity has been associated with reduced blood pressure, risk of obesity, type-2 diabetes, cardiovascular disease, osteoporosis and arthritis (Gilmour, 2007). Increased physical activity has also been associated with mental health benefits such as higher life satisfaction, as well as reduced anxiety, depression and stress (Gilmour, 2007). Previous research in the United States, Australia, Canada, Scotland and the United Kingdom found that dog walkers are significantly more likely to meet the recommended activity levels than non-dog walkers and non-dog owners (Antonacopoulos, 2009; Brown & Rhodes, 2006; Feng et al., 2014; Ham & Epping, 2006; Thorpe, Simonsick, & Brach, 2006). A possible reason why dog owners have been found to be more physically active is a dog's inherent need to be walked which could lead to their owners being more active (Wood, Giles-Corti, & Bulsara, 2005). In a sample of elderly participants, dog owners were 12% more active than the non-dog owners (Feng et al., 2014).

Pet dogs can be effective partners in a walking-based physical-activity programme (Johnson & Meadows, 2010; Kushner, Blatner, Jewell, & Rudloff, 2006; Peel, Douglas, Parry & Lawton, 2010). American adults have been found to be significantly more likely to adhere to a long-term physical activity programme when they walked with their dogs, compared to those who walked with a person (Kushner et al., 2006). Dog ownership isn't a direct requirement for a person to benefit from a dog's need to be walked (Johnson & Meadows, 2010; Peel et al., 2010). Dogs have also been found to increase physical activity in non-dog owners who walked a therapy dog or another person's dogs (Johnson & Meadows, 2010; Peel et al., 2010).

Pet ownership has been found to have a beneficial effect on general health. This includes going to the doctor less often, higher self-rated health and better sleep (Headey & Grabka, 2007). Single pet owning American mothers reported using significantly less medicine and visited the doctors less than their non-pet owning counterparts (Koontz, 2009). In a study of elderly Norwegians, dog owners reported better self-rated health in comparison to non-pet owners and cat owners (Enmarker, Hellzen, Ekker & Berg, 2012).

Conflicting findings were reported in a sample of elderly, Dutch participants. The pet owners did not differ in terms of physical health in comparison to the non-pet owners (Rijken & Beek, 2011). A possible reason for these conflicting findings was that the sample suffered from chronic illness and disability, which limits the generalisability of these findings (Rijken & Beek, 2011).

2.2.2 Psychological benefits

International research on mentally ill patients and advanced heart-failure patients have found AAI to significantly reduce anxiety (Cole et al., 2007; Hoffmann et al., 2009; Lang, Jansen, Wertenauer, Gallinat, & Rapp, 2010; Nepps et al., 2014). These studies all assessed the short-term effects of HAI on anxiety. A significant reduction in anxiety levels were found in hospitalised American heart-failure patients after a 12-minute visit by a therapy dog compared to their pre-test scores (Cole et al., 2007). However, in South

Africa, elderly retirement home residents showed no difference in anxiety levels after an AAA intervention in comparison to the preintervention scores (Le Roux & Kemp, 2009).

Research in the USA has found reduced depression levels in mentally ill patients after attending a 12-week AAI with farm animals (Berget et al., 2008; Pedersen, Martinsen, Berget, & Braastad, 2012). In Berget et al. (2008) a significant reduction in depression was found in the AAI group compared to the control group. Additionally, the AAI group also had significantly lower depression levels six months after the completion of the intervention compared to the control group (Berget et al., 2008). This highlights the potential for long lasting beneficial effects of AAT interventions (Berget et al., 2008). Pedersen et al. (2012) found significantly reduced depression levels in their AAI group in comparison to their preintervention scores. However, no difference was found in the control group. In South Africa, similar findings were reported in Le Roux and Kemp (2009) who found a significantly lower post-test depression score in the AAA group, in comparison to their preintervention score.

Conflicting findings were reported in a sample of South African retirement home residents (Buckle, 2015). No significant difference in depression was found between the AAI group and the control group post intervention (Buckle, 2015). The researcher suggested that the participants depression scores were low to begin with which may have left little room for improvement.

Survey research in the USA has found no difference in depression levels between pet owners and non-pet owners (Antonacopoulos & Pychyl, 2010; Cline, 2010; Tower & Nokota, 2006). However, two of the studies took marital status and gender into consideration and found that unmarried people and women benefited more from pet ownership (Cline, 2010; Tower & Nokota, 2006). Tower and Nokota (2006) found that in unmarried women, the pet owners reported significantly lower depression scores compared to the non-pet owners. In unmarried men, there was a non-significant difference in

depression scores between pet owners and non-pet owners. However, in the married women and men, pet owners reported significantly higher depression in comparison to the non-pet owners (Tower & Nokota, 2006). Cline (2010) found dog ownership to predict lower depression in their female participants. However, in the male participants, dog ownership was not associated with depression. A possible reason for this could be that women might place greater value on their relationship with their dog (Cline, 2010).

Past research investigating loneliness and pet attachment has produced conflicting findings in both control group studies and survey research (Antonacopoulos & Pychy, 2010; Buckle, 2015; Wood, Giles-Corti, Bulsara, & Bosch, 2007). An Australian survey reported non-pet owners to be two times more likely to report being lonely than the pet owners (Wood et al., 2007). In contrast, a Canadian survey found no difference in loneliness scores between pet owners and non-pet owners (Antonacopoulos & Pychy, 2010). AAI has been found to reduce loneliness in elderly American participants (Banks, Willoughby, & Banks, 2008; Vrbanac et al., 2013). The study by Banks et al. (2008) was unique in that they investigated the effect of an 8-week AAI from a therapy dog, as well as a robotic-dog group. A significant reduction in loneliness was found in both the living dog and robotic-dog groups when comparing their post and pre-intervention scores. No difference was found in the control group. In elderly South Africans, no significant difference in loneliness between an AAI and control group at the end of an 8-week AAI (Buckle, 2015).

2.2.3 Social benefits

Aside from the physical and psychological benefits of HAI, pets have been found to be a source of social support (Kikusui et al., 2006; Risley-Curtiss, 2010). Moreover, pets have also been found to facilitate social interaction among strangers (Cutt, Giles-Corti, Wood, Knuiman, & Burke, 2008; Guéguen & Ciccott, 2008; Hill et al., 2008; Knight & Edwards, 2008; Lee, Shepley, & Huang, 2009; Wood et al., 2007). Risley-Curtiss (2010) suggest that pets provide us with social support because of the unconditional love and affection we

receive from them. Pets have been found to satisfy the social needs of the people that care for them (Hirschman, 1994). They act as friends, providing unconditional love and acceptance, which contribute to satisfying peoples innate need to feel loved (Hill et al., 2008; Nebbe, 2001).

Pets, specifically dogs, can provide opportunities for their owners to meet new people. Dogs have been found to increase social interaction among people in public areas such as parks and sidewalks (Cutt et al., 2008; Guéguen & Ciccott, 2008; Knight & Edwards, 2008; Lee et al., 2009; Wood et al., 2007). Wood et al. (2005) found that dogs can increase the likelihood of their owner's socialising with strangers while they are walking their dogs. Thereby leading to increased social interaction among members of a community. In a control group study Guéguen and Ciccott (2008) also found that the presence of dogs facilitates social relations. People were significantly more helpful and trusting when a stranger with a pet dog approached them than when the stranger did not have a pet dog.

The tendency for a person's perception of others to change when they are accompanied by a pet was also found in a sample of American university students (Schneider & Harley, 2006). The participants' evaluated the therapists with a dog more positively and as being more trustworthy than the therapists who were alone (Schneider & Harley, 2006). Dogs have also been found to facilitate social interaction among family members (Hill et al., 2008). Dog walking together can provide an opportunity for bonding among members (Hill et al., 2008).

In South Africa, qualitative feedback on the effects of AAI has found increased social interaction among participants (Coetzee et al., 2013; Le Roux & Kemp, 2009; Lubbe & Scholtz, 2013). A qualitative study on a sample of South African guide dog owners showed that their guide dogs increased their interaction with other people (Wiggett-Barnard & Steel, 2008). Some of the other themes were a profound gratitude for their guide dog, pride in owning a guide dog, improved mobility, and increased independence.

2.3 PET ATTACHMENT

Humans are biologically driven to seek out emotional connections with others, which provides them with emotional and physical support (Bowlby, 1977). These emotional connections are not just limited to human relationships but are also experienced in human-animal relationships (Beck, 2014). This emotional connection, also known as pet attachment, is characterised by qualities similar to those experienced in human relationships, such as love, affection, support and relief from emotional distress (Field et al., 2009; Noonan, 2008). One possible reason for this is that a pet's love is unconditional, loyal, and free from judgment and pretence (McCune et al., 2014). Like children, pets are reliant on their caregiver to provide them with food, shelter and mental stimulation. As a result, pet owners tend to take on a similar caregiving role with their pets (Bowlby, 1982; Mikulincer & Shaver, 2007). Pets have been repeatedly found to be considered as one of the family (Adrian et al., 2009; Hunt & Padilla, 2006; Kaufman & Kaufman, 2006; Levin & Trost, 1992).

Chur-Hansen, Winefield, and Beckwith (2009) found the relationship between pet attachment and the health benefits in human (physical and psychological) to be bell shaped, rather than linear. According to this hypothesis, pet owners with a moderate attachment to their pet would gain the most health benefits. An over-dependent relationship with a pet has been suggested to possibly create mental health issues (Chur-Hansen et al., 2009). Another possible explanation could be that some people's overly close relationship with their pets, could prevent them from seeking out human relationships, which could have a negative impact on well-being (Cavanaugh, Leonard & Scammon, 2008). This explanation is contradicted by McConnell et al. (2011) who reported that there was no evidence that people's relationships with their pets negatively affect their relationships with other people.

Past research has identified a number of factors that can influence the extent to pet attachment (Cohen, 2002). These factors include age, gender,

race, marital status and living arrangements, type of pet owned, social support and length of pet ownership.

2.3.1 Factors associated with pet attachment

People of all ages have reported high pet attachment, past research investigating the relationship between age and pet attachment is inconsistent (Byers et al., 2014; Cohen, 2002; Netting et al., 2013). Cohen (2002) suggested that older people tend to have a stronger attachment to their pets than younger people. However, more recent research in the USA has found younger pet owners to have a higher attachment to their pets, in comparison to older pet owners (Byers et al., 2014; Netting et al., 2013). These studies recruited their participants from local veterinary clinics in the USA (Byers et al., 2014; Cohen, 2002; Netting et al., 2013). Further conflicting findings were reported in Gerber (2016) who found no significant difference in pet attachment between different age groups in a sample of South African university students.

Women have a tendency to score higher on pet attachment, in comparison to their male counterparts. This has been found in samples of Norwegian, European, Australian, Slovenian, New Zealand, South African, and American pet owners (Andreassen et al., 2013; Winefield, Black, & Chur-Hansen, 2008; Gerber, 2016; Lewis, Krägeloh, & Shepherd, 2009; Lue, Pantenburg, & Crawford, 2008; Quinn, 2005; Smolkovic, Fajfar, & Mlinaric, 2012). Andreassen et al. (2013) not only found women to score higher on pet attachment but women also reported more health benefits than men. Similarly, in South Africa, Gerber (2016) reported that the female students scored significantly higher on pet attachment compared to their male counterparts. This has been suggested to be as a result of women's maternal characteristics being extended from babies to pets (Prato-Previde, Fallani, & Valsecch, 2006). However, some studies have found a non-significant difference in pet attachment between genders (Herzog, 2007; Prato-Previde et al., 2006). Prato-Previde et al. (2006) reported no significant difference in

pet attachment between men and women. This sample of volunteers from a veterinary clinic scored high on pet attachment.

More recent research in the USA and Mexico found no significant difference between race groups in terms of pet attachment (Chen, Hoffman, Jacobson, & Serpell, 2013; Risley-Curtiss, Holley, & Wolf, 2006; Schoenfeld-Tacher, Kagan, & Wright, 2010). In a sample of American students, race had no effect on the comfort, unconditional love and companionship received from a pet (Risley-Curtiss et al., 2006). Similarly, in a sample of clients from a Mexican veterinary clinic, no significant difference in pet attachment between non-Hispanic Caucasians, Hispanics, and the other groups was found (Schoenfeld-Tacher et al., 2010).

Survey research in the USA and Switzerland has found that people who lived alone or were divorced reported a higher attachment to their pets in comparison to married people and those who lived with others (Poresky & Daniels, 1998; Staats, Sears, & Pierfelice, 2006). Single people and those who live alone could lack the support of a partner or spouse which might be provided by a pet (Staats et al., 2006). Stronger attachment bonds have been reported by dog owners who had no children under the age of 18 living at home compared to those who do have children living at home (Lue et al., 2008).

While humans form bonds with many different types of animals, such as rabbits, rats, or reptiles, most people have reported their attachment to a dog (Kurdek, 2009; Sable, 2013). Some research suggests that dog owners are more attached to their dogs than other types of pet owners (Smolkovic et al., 2012; Winefield et al., 2008). This could be as a result of dogs having evolved together with humans (Mueller, 2014). Significantly more pet owners who owned both a cat and a dog, reported being more attached to their dog. More care required by dogs could contribute to a higher pet attachment in dog owners (Smolkovic et al., 2012). This additional care can include grooming, training and walking.

Pedigree dog owners have been found to score higher on pet attachment than non-pedigree dog owners (Smolkovic et al., 2012). The researchers suggested this could be attributed to pedigree dogs being more expensive, requiring longer planning before buying, better care and more joined activities. However, in the same study, pedigree cat owners did not show this relationship with their pedigree cats (Smolkovic et al., 2012). They concluded that while pedigree can contribute to pet attachment in dog owners, it does not appear to be related in other types of pet owners (Smolkovic et al., 2012).

Research in the USA suggests that a positive relationship exists between pet attachment and social support (Byers et al., 2014; Koontz, 2009; Krause-Parello, 2012). Byers et al. (2014) found the young dog owners who experience low social support, have a high attachment to their dogs. This is believed to occur because pets can provide an emotionally safer relationship, characterised by unconditional love, comfort and acceptance (Kurdek, 2009; Nebbe, 2001). This was confirmed by Gerber (2016) in South Africa who found pet attachment to be significantly related to social support. Conflicting findings were found in Slovenian and Australian adults, who reported a non-significant relationship between pet attachment and social support (Smolkovic et al., 2012; Winefield et al., 2008). A possible explanation for these findings is that people who have problems with attachment to other people could be more attached to their pets as a way to make up for the lack of social support (Kurdek, 2009; Smolkovic et al., 2012).

Past survey research in the USA, Italy and Slovenia suggests that pet attachment strengthens over time (Cavanaugh et al., 2008; Marinelli, Adamelli, Normando, & Bono, 2007; Smolkovic et al., 2012). Cavanaugh et al. (2008) found pet owners who had owned their pets for more than three years scored significantly higher on pet attachment in comparison to those who had owned their pet for less than three years. The researchers suggested that the benefits of the HAB may be more pronounced over time (Cavanaugh et al., 2008).

2.4 PERCEIVED STRESS

Perceived stress is a diverse phenomenon with biological, psychological and social components that effect different people in different ways, at different times and across various contexts (Lazarus, 1993; Selye, 1976). When people are faced with a life event, they appraise the situation (Lazarus & Folkman, 1984). The researchers theorised that when people appraise their situation as harmful, threatening or challenging, they experience stress. One person may appraise something as very stressful while another could see it as an opportunity. This subjective perception of the event causes physiological and affective responses that are associated with stress (Lebois, Hertzog, Slavich, Barrett, & Barsalou, 2016).

Some of these physiological responses include an increase in stress hormones, blood pressure, heart-rate, pupil dilation, and perspiration (McLead, 2010). Affective responses can include negative emotions such as anger, and anxiety (Aylward et al., 2017). The physiological and affective effects can vary depending on how the situation is interpreted. Rice (2000) described stress as a person's physiological and mental responses that they experience when they need to adapt to changing circumstances. These changes can be good or bad, and do not necessarily need to be objective (Rice, 2000). Prolonged exposure to stress, also known as chronic stress, can lead to wide variety of physiological and psychology implications (Magalhaes Das Neves, Loots, & Van Niekerk, 2014). Chronic stress has been linked to chronic illnesses like cardiovascular disease, reduced immune functioning, obesity and asthma (Carlson, 2017; Cohen, Janicki-Deverts, & Miller, 2007; Griffin, 2010). Stress has also been identified as a key risk factor in the developments psychiatric illness such as mood, anxiety and panic disorders (Cohen et al., 2007).

People respond to stress in different ways because each person has their own values, beliefs and ways of coping. The different ways people deal with stress are referred to as coping mechanisms (Lazarus & Folkman, 1984). The focus of coping mechanisms is to either change the perception of the

stressor or shift attention away from it (Lazarus & Folkman, 1984). A stressor is any physical, psychological or social force that a person perceives to be a potential threat (Carver & Connor-Smith, 2010). While theorists have identified hundreds of coping mechanisms, two broad categories are frequently mentioned, namely, emotion-focused coping and problem-focused coping (Carver & Connor-Smith, 2010; Lazarus & Folkman, 1984).

Emotion-focused coping is an attempt to lessen the negative emotional responses associated with stress (Lazarus & Folkman, 1984). This is done by seeking social support, reappraising the stressor from a more positive viewpoint, taking responsibility, and using avoidance (Carver & Connor-Smith, 2010). These strategies, such as avoidance, distract the person from the negative emotions associated with the stressor. Problem-focused coping is an attempt to deal with the root cause of the problem (Lazarus & Folkman, 1984). Three types of problem-focused coping have been identified. These are information seeking, taking control, and evaluating the positive and negative aspects of a stressor.

People tend to use a number of different ways of coping in different situations, which can change over time (Taylor, 2006). Problem-focused coping provide a long-term solution, it is not always possible or helpful to use them (Taylor, 2006). For example, when people are trying to cope with bereavement. In such cases, people make use of emotion-focused coping mechanisms such as seeking social support. In a different situation like stress over an upcoming exam, the use of a problem-focused coping strategy would be more effective. Taking control by preparing for the exam could lead to a reduction in the negative feelings associated with the exam. The use of emotion-focused coping mechanisms such as avoidance could be counterproductive as the negative feelings could increase (Taylor, 2006).

In South Africa, high perceived stress has been repeatedly documented in a variety of sub-groups such as students, management employees, AIDS care volunteers, nursing staff, and low-income groups (Akintola, Dageid, & Hlengwa, 2013; Bhat & Basson, 2013; Hamad et al., 2008; Van der Colff &

Rothmann, 2014; Vawda, 2003). For this reason, it is important to gain an understanding of the factors that predict and influence perceived stress, which include biological, physical and psychological processes. This information could be used to determine how the perception of stress originates and it can be used to come up with strategies to combat stress. Past research has identified a number of factors that can influence a persons perceived stress (Cohen, 2002). These factors include age, gender, race, marital status, social support, environmental stressors, and physical activity.

2.4.1 Factors associated with perceived stress

Most of studies have found perceived stress to decrease with age (Chianga & Changa, 2012; Cohen & Janicki-Deverts, 2012; Nordin & Nordin, 2013; Stone, Schwartz, Broderick, & Deaton, 2010; Van der Colff & Rothmann, 2014). The data collected in the American studies were based on samples of over 2000 respondents from the general population (Cohen & Janicki-Deverts, 2012; Nordin & Nordin, 2013; Stone et al., 2010). Uchino, Berg, Smith, Pearce, and Skinner (2006) found that older people tend to experience less negative emotions when faced with an increase in daily stress in comparison to their younger counterparts. This suggests an increase in ability to effectively handle day to day stressors with age. In South Africa, Van der Colff and Rothmann (2014) collected data from a relatively large sample of nurses. This negative relationship between perceived stress and age has been attributed to older people perceiving daily hassles as less stressful and have developed more effective ways of coping (Cohen & Janicki-Deverts, 2012). However, a non-significant relationship between age and perceived stress has been found in two studies from the USA and South Africa (Be Lue, Beard, Murray-kolb, Schreiner, & Taylor-Richardson, 2008; Diehl & Hay, 2010). These studies compromised of relatively small samples which may account for the conflicting results.

Past survey research in the USA, Sweden and South Africa suggests that women experience higher perceived stress than their male counterparts (Cohen & Janicki-Deverts, 2012; Nordin & Nordin, 2013; Stone et al., 2010;

Thomas & Borraro, 2016; Van Kim & Nelson, 2013). South African studies have found a significantly higher perceived stress in female students compared to their male counterparts (Bhat & Basson, 2013; Vawda, 2003). A sample of low income South African adults also found a significantly higher perceived stress level in the female participants compared to the males (Hamad et al., 2008). A possible reason for this is that women might be more open to admitting to stress they experience (Bhat & Basson, 2013). Another South African study found a non-significant difference in perceived stress between male and female nursing staff (Van der Colff & Rothmann, 2014). A limitation noted in this study was that only 2.6% of the participants were male.

In the USA, Caucasians on average have reported significantly higher perceived stress than other racial groups (Cohen & Janicki-Deverts, 2012; Kim, Bursac, DiLillo, White, & West, 2009). However, when education, income and employment status were controlled for, no significant difference was found between racial groups on perceived stress scores (Cohen & Janicki-Deverts, 2012). Recent research in South Africa suggests no difference in perceived stress between different racial groups in students and breast cancer patients (Beukes, Walker, & Esterhuysen, 2010; Castro & Schlegel, 2006). Beukes et al. (2010) suggested that no difference in perceived stress between white and black students could be an indication of increase social integration of black students.

Married Canadian dental students have been found to experience lower perceived stress than their unattached counterparts (Muirhead & Locker, 2007). The researchers theorised that the support provided by one's spouse could provide a strong source of social support. This could in turn aid in buffering the negative effect of stress. Conflicting findings were reported in a South African study which found married dental students scored higher on perceived stress in comparison to the other relationship status's (Bhat & Basson, 2013). This may have been caused by the added family responsibilities and duties. A non-significant relationship between marital status and perceived stress was reported in a small sample of young South

African mothers living in an informal township (Be Lue et al., 2008). More than half of the women felt they could not depend on their partner for support which could explain the contradictory finding.

Social support has been found to be an important factor in people's perception of stress. Social support from friends and family has been found to aid in buffering the negative effects of stress. In a sample of Cyprian adults who suffered from anxiety disorders, perceived social support was found to be a significant predictor of perceived stress (Panayiotou & Karekla, 2013). Similarly, in American college students, having more close friends and adult social support was found to significantly correlate with lower perceived stress (Bland, Melton, Bigham, & Welle, 2014; Van Kim & Nelson, 2013; Whitney, 2010). Whitney (2010) considered the relationship between perceived stress and sources of social support. More close friends and family were related to lower perceived stress in this study. However, perceived stress was not related to more casual friends (Whitney, 2010). Social support has been identified as a powerful predictor of perceived stress in medical students, AIDS care volunteers and young mothers living in an informal settlement (Akintola et al., 2013; Be Lue et al., 2008; Vawda, 2003). Akintola et al. (2013) investigated stress among AIDS care volunteers. In this study lack of support was identified as one of the three main predictors of stress. The other two predictors of stress were work overload and the devastating effects of AIDS on their patients. Similarly, data from new mothers in Khayelitsha found partner support to be the most powerful predictor of their perceived stress levels (Be Lue et al., 2008). This study found a significant relationship between their perceived stress and their partner having other wives, not providing practical help and their partner being unemployed.

In South Africa Be Lue et al. (2008) examined how environmental stressors related to perceived stress in the sample of new mothers from Khayelitsha. When considering environmental factors, they found portable water to be the most powerful predictor of perceived stress. It could very difficult for a new mother to collect water from outside the home, and it

could lead to them using unsanitary water. This can have devastating effects because infant mortality is often caused by unsanitary water in urban settlements (Department of Health Pretoria, South Africa, 2003; Shi 1998). This could contribute to the high perceived stress in this sample. Similarly, a direct relationship was found between social economic status and perceived stress in a different sample of South Africans (Hamad et al., 2008). These studies were similar in that the samples consisted of adults from low income groups (Be Lue et al., 2008; Hamad et al., 2008).

Regular physical activity reduces blood pressure and heart-rate which causes the body to feel more relaxed (Bland et al., 2014). This can have a beneficial effect on people's perception of stress (Bland et al., 2014). Cross-sectional research on university students in the USA have found an inverse relationship between physical activity and perceived stress (Richardson, 2014; Van Kim & Nelson, 2009). This is consistent with findings from a cross-sectional study in Denmark which reported high perceived stress to be related to low levels of physical activity (Rod, Gronbaek, Schnohr, Prescott, & Kristensen, 2009). More specifically, different types of physical activity have been found to be effective at significantly reducing perceived stress. In South Africa, Magalhaes Das Neves et al. (2014) reported a significant reduction in the pre- and post-test perceived stress scores for the aerobic exercise and the somatic awareness training group. No difference was found in the control group (Magalhaes Das Neves et al., 2014).

2.5 LIFE SATISFACTION

Life satisfaction refers to a person's subjective evaluation of their life as a whole (Diener & Chan, 2011). It is a reflection of a person's feelings and attitudes about their life at a specific point in time (Diener, Emmons, Larsen, & Griffin, 1985). This reflection entails assessing what they have achieved in comparison to what they desire (Diener, Lucas, & Oishi, 2003). Therefore, greater incongruence between a person's desires and achievements can lead to higher life satisfaction (Diener et al., 2003). Unlike quality of life, it does

not take into consideration objective components (Diener et al., 1985). In other words, the standard each person measures themselves against is based on their own personal judgements rather than being externally imposed (Diener et al., 1985). Life satisfaction is considered to be one of the most well-established measures of positive functioning (Suldo, Riley, & Shaffer, 2006). Life satisfaction can have a significant effect on both mental and physical health (Diener & Chan, 2011). Changes in mood have been found to correlate with changes in cardiovascular and immune functioning (Diener & Chan, 2011).

Research suggests that a person's life satisfaction is dependent to a certain degree on both environmental and hereditary factors (Bartels, 2015). A meta-analysis of 30 twin-family studies concluded that the genetic influence of life satisfaction is difficult to determine because the heritability estimates ranged from 0 to 64% (Bartels, 2015).

Past research has identified a number of factors that can influence a person's life satisfaction. These factors include age, gender, race, marital status, social support, social environment, poverty, income, health, physical activity, and self-esteem.

2.5.1 Factors associated with satisfaction of life

A number of large, international studies have examined the relationship between age and life satisfaction. Studies in Estonia, Latvia, Britain, Japan, and USA have found life satisfaction to be the highest in early and late adulthood (Baird, Donnellan, Lucas, & 2010; Blanchflower & Oswald, 2011; Realo & Dobewall, 2011; Tiefenbach & Kohlbacher, 2014).

Data from other countries such as Latvia, Sweden, Germany, showed that the relationship remained relatively constant throughout adulthood (Baird et al., 2010; Realo & Dobewall, 2011), while research in Spain revealed no relationship between age and life satisfaction (Vázquez, Duque, & Hervás, 2012). In South Africa, Le Roux and Kagee (2008) reported a positive relationship between age and life satisfaction in a sample of black South African adults living with chronic illnesses. As people grow older, they gain knowledge about themselves and the world. This knowledge can lead to a

more positive perspective on life. Regardless of the nature of the relationship across adulthood, a number of studies have found a significant decline in late adulthood (Baird et al., 2010). This decline in old age could be a consequence of less social support, health problems and the inevitability of death (Baird et al., 2010). Longitudinal studies also suggest that life satisfaction is relatively consistent over a 30-year period (Realo & Dobewall, 2011).

There is a great deal of inconsistency in the literature on the relationship between gender and life satisfaction (Booyesen & Botha, 2012; Joshanloo & Afshari, 2011; Kruger & Sonono, 2016). There are studies which suggest women experience lower life satisfaction than men (Booyesen & Botha, 2012; Hutchinson et al., 2004; Neto & Barros, 2007). However, there is just as much literature suggesting women score significantly higher life satisfaction in comparison to their male equivalents (Gauthier, Christopher, Walter, Mourad & Marek, 2006; Joshanloo & Afshari, 2011).

In America, Iran, and South Africa, female students reported higher life satisfaction in comparison to the male students (Gauthier et al., 2006; Jackson, Van de Vijver, & Fouché, 2014; Joshanloo & Afshari, 2011). With regards to the South African study, female students might see more opportunities in a post-apartheid South Africa (Herman, 2000; Jackson et al., 2014). According to the Department of Labour South Africa (2013), white South African women have more opportunities post-apartheid than previously experienced, while their white male counterparts may have felt deprived of opportunities they had previously been given during the apartheid regime (Jackson et al., 2014; Herman, 2000).

No difference in life satisfaction between genders has been found in a number of studies based on samples from a wide variety of social and cultural environments (Kayitesi & Mwaba, 2014; Kruger & Sonono, 2016; Patel et al., 2009; Vázquez et al., 2012). Some of these include South Africans with chronic illness, students, Christians, as well as Spanish adults (Kayitesi &

Mwaba, 2014; Kruger & Sonono, 2016; Le Roux & Kagee, 2008; Patel et al., 2009; Vázquez et al., 2012).

White Americans have reported significantly higher life satisfaction in comparison to their black counterparts (Blanchflower & Oswald, 2011). Moreover, past research in South Africa has also found white South Africans to experience a higher life satisfaction in comparison to other racial groups (Booyesen & Botha, 2012; Ebrahim, Botha, & Snowball, 2013; Patel et al., 2009). Two of these studies collected data from large samples of the general population (Booyesen & Botha, 2012; Ebrahim et al., 2013). While Patel et al. (2009) collected data from a small sample of white, black, and Indian South African Christians. Previous research has attributed these life satisfaction differences to social status (Soons & Kalmijn, 2009). While others attributed this difference to the benefits white South Africans experienced during apartheid (Ebrahim et al., 2013).

A great deal of research suggests that married people experience greater life satisfaction in comparison to other marital statuses (Cavanaugh et al., 2008; Dolan, Peasgood, & White, 2008; Frey, 2008; Soons & Kalmijn, 2009; Stanca, 2009). A large South African survey provided insight into the relationship between marital status and life satisfaction (Booyesen & Botha, 2012). Married South Africans reported higher life satisfaction than other marital status groups (Booyesen & Botha, 2012). Past research has attributed this to the emotional and financial protective factors accompanied by marriage (Gove, Style, & Hughes, 1990; Stutzer & Frey, 2006). These factors include the sharing of household responsibilities, reduced chance of loneliness and providing a source of social support (Gove et al., 1990; Stutzer & Frey, 2006). In the study by Booyesen and Botha (2012), widowed and cohabitating adults reported the lowest life satisfaction (The researchers suggested that it may be an effect of social stigma (Booyesen & Botha, 2012). This was in contrast to other studies that found no difference between cohabitating and married respondents (Brown, 2000; Dolan et al., 2008).

Social support is one of the most powerful predictors of life satisfaction (Diener, 2002). Long lasting and nurturing relationships can have a beneficial effect on people's life satisfaction (Seligman, 2011). Studies in China, Cyprus and the USA found a direct relationship between social support and life satisfaction (Li et al., 2014; Panayiotou & Karekla, 2013; Whitney, 2010). In a sample of American university students, having more close friends, and adult social support, were found to significantly correlate with higher life satisfaction. However, a non-significant relationship was found between having more casual friends and life satisfaction (Whitney, 2010). In this study, having adult support was found to be the strongest predictor of life satisfaction. The researcher concluded that feeling supported and cared for can have a beneficial effect on life satisfaction (Whitney, 2010). A longitudinal study in the USA found people who had a happy friend who lived in close proximity (less than 1.6 km), were 25% more likely to be happy in the future (Fowler & Christakis, 2008).

The social environment in which one lives can influence life satisfaction. People living in societies characterised by conflict, war and poverty are less happy than those living in societies characterised by cooperation and safety (Suh & Koo, 2008). International research has found that poverty stricken communities whose basic needs are met, such as, food, water and housing, tend to experience higher life satisfaction (Diener et al., 1985). This is consistent with South African research. More effective health care and social services, and higher living standards have been found to be associated with higher life satisfaction among black South Africans (Dodd, 2016; Moller, 2007). The reverse has also been supported, black South Africans residing in communities that receive poor service delivery in areas such as housing, electricity and water, experience lower satisfaction with life (Moller, 2007).

Poverty stricken areas experience violent protests, civil unrest with regards to service delivery, and high crime which all contribute to lower life satisfaction (Moller, 2007; Posel & Casale, 2011). Poverty is also associated with greater prejudice toward out-groups which leads to racism (Brown,

1995). The increased racism often results in conflict and aggression (Brown, 1995). Thereby creating a self-perpetuating cycle that contributes to lower life satisfaction. The converse has also been found to be true in a sample of black South African students (Kayitesi & Mwaba, 2014). Kayitesi and Mwaba (2014) found a positive relationship between life satisfaction and a more positive perception of African immigrants.

Both absolute and relative income have been found to relate to life satisfaction. Absolute income only takes into account the amount a person earns within a certain time period (Diener, Sandvik, Seidlitz & Diener, 1993). Relative income measures a person's income in relation to their peers and other members of society. Absolute income allows people to meet their basic needs, which is directly related to life satisfaction, especially in low income groups (Veenhoven, 1991). In Japan and South Africa, life satisfaction is positively correlated with income (Moller, 2007; Tiefenbach & Kohlbacher, 2014). Other studies deduce perceived relative income rather than actual income to have a greater effect on life satisfaction (Posel & Casale, 2011). More specifically, the relationship between income and life satisfaction may be influenced by what other people earn.

A positive relationship was found between life satisfaction and health in married South Africans (Booyesen & Botha, 2012). The married respondents who experienced a higher life satisfaction, might have been less likely to make unhealthy behavioural choices such as smoking and heavy drinking (Booyesen & Botha, 2012; Stevenson & Wolfers, 2007). In the same study, a non-significant relationship was found between life satisfaction and health in the cohabitating participants (Booyesen & Botha, 2012). A possible reason for this finding could be that people who have poor health might more likely be in a cohabitating relationship as it requires less commitment from their partner (Booyesen & Botha, 2012; Brown, Bulanda, & Lee, 2005).

Regular physical activity can have a beneficial effect on life satisfaction (Maher, Doerksen, Elavsky & Conroy, 2014). Regular physical activity refers to participating in a minimum of 30 minutes a day, three times per week (Kruger

& Sonono, 2016). Edwards (2006) investigated the relationship between regular physical activity and life satisfaction in adults who have a gym membership. The participants who partook in regular physical activity were significantly more likely to experience higher life satisfaction. A possible reason for this could be that people who do not partake in regular physical activity may have a lower body image which could lead to lower levels of life satisfaction (Kruger & Sonono, 2016).

Self-esteem refers to a person's overall evaluation of their self-worth (Rosenberg, 1965). These evaluations are based on the person's perceptions of their physical, psychological and social functioning (Dlugonski & Motl, 2012). Studies in China reported a positive relationship between life satisfaction and self-esteem (Blachino, Przepiorka, & Pantic, 2016; Zhang & Leung, 2002).

A possible explanation for this relationship is that people with high self-esteem might be more ambitious and take risks to achieve their goals (Baumeister, Tice, & Hutton, 1989).

2.6 PERCEIVED STRESS, SATISFACTION WITH LIFE AND HAI

Past research suggests that a negative relationship exists between a person's perceived stress and their life satisfaction (Samaha & Hawi, 2016; Schiffrin & Nelson, 2010; Surujlal, Van Zyl, & Nolan, 2013; Walker, Esterhuyse, & Van Lill, 2010). In other words, people with a higher life satisfaction tend to experience lower perceived stress, and vice versa. Studies on American university students have revealed a strong inverse relationship between satisfaction with life and perceived stress (Samaha & Hawi, 2016; Schiffrin & Nelson, 2010). Samaha and Hawi (2016) reported that when perceived stress increased by 1 standard deviation from the mean, life satisfaction decreased by 0.5 standard deviations. Studies on samples of South African chronic pain patients, and university students, also supports the notion that perceived stress is negatively correlated with life satisfaction. (Surujlal et al., 2013; Walker et al., 2010). Surujlal et al. (2013) found a significant inverse relationship was

also found between perceived stress and life satisfaction in South African student-athletes. On average, this sample was moderately satisfied with life in spite of their slightly higher than average stress levels (Surujlal et al., 2013). The researchers attributed this weaker relationship to the student's studies and sport responsibilities.

Past research provides a great deal of support for the notion that pets can have a beneficial effect on perceived stress, in a variety of different populations (Barker, Barker, McCain, & Schubert, 2016; Lass-Hennemann et al., 2014; Lee & Chai, 2015; Ramirez & Hernandez, 2014). In a German study, a dog's presence was found to significantly reduce perceived stress in participants after exposure to a traumatic film, in comparison to the toy and human control groups (Lass-Hennemann et al., 2014). The researchers proposed that dogs can have a beneficial effect on people after they have experienced a traumatic situation. Similar findings were reported in a sample of American students after a 15-minute AAI (Barker et al., 2016). A significant reduction was found in their post-interaction scores compared to their pre-interaction scores (Barker et al., 2016). The effect size was very large for this difference (Barker et al., 2016).

Likewise, cross-sectional studies on pet ownership in Jordan, the USA and Mexico have also revealed significantly lower perceived stress levels in pet owners in comparison to non-pet owners (Lee & Chai, 2015; McConnell et al., 2011; Ramirez & Hernandez, 2014). Lee and Chai (2015) attributed these findings to a dog's ability to provide companionship which can reduce loneliness and buffer the negative effects on stress. The researchers also suggested that the dog owners may have been more physically active which may contribute to their lower perceived stress (Lee & Chai, 2015). McConnell et al. (2011) attributed their significant findings on a dog's ability to buffer against stress, especially when the dog fulfils its owner's social needs. Meanwhile, Ramirez and Hernandez (2014) attributed the significantly lower perceived stress scores in the dog owners to the biophilia hypothesis, which

proposes that HAI reduces stress by fulfilling an innate need to connect with other living things.

These results conflict with findings in studies of Malaysian adults as well as American university students which found a non-significant difference in perceived stress between pet owners and non-pet owners (Wade, 2017; Wen Li, Yusof, Zakaria, & Ali, 2017). The majority of the Malaysian pet owners in Wen Li et al. (2017) reported a low level of pet attachment. The researchers suggested that the respondents may have had other sources of social support, such as families and friends (Wen Li et al., 2017).

When taking pet attachment rather than pet ownership status into account, conflicting results were also found (Koontz, 2009; Wen Li et al., 2017). In a sample of single mothers in the USA, there was no relationship between perceived stress and pet attachment (Koontz, 2009). While pet attachment was found to be inversely related to perceived stress in the study by Wen Li et al. (2017).

Majority of past research in Mexico, Ireland and the USA suggests life satisfaction does not differ between pet and non-pet owners (El -Alayli, Lystad, Webb, Hollingsworth, & Ciolli, 2006; Mháistir, 2013; Ramirez & Hernandez, 2014). Mháistir (2013) collected data from a sample of Irish elderly people recruited from a senior citizens organisation. The researcher suggested that while the pets may have buffered their owner's stress, their financial concerns had a negative effect on their life satisfaction (Mháistir, 2013). In a sample of Mexican adults, there was a non-significant difference in life satisfaction between pet owners and non-pet owners (Ramirez & Hernandez, 2014). While the sample was satisfied with their relationship with their dogs, most spent little time participating in daily activities with their dogs (Ramirez & Hernandez, 2014).

Other studies have found results that differ from the previously mentioned studies. In the USA, Bao and Schreer (2016) found that pet owners scored significantly higher on life satisfaction than compared to the non-pet owners. The same study found a non-significant different difference in

happiness, positive emotions, or negative emotions. The majority of the respondents had owned their pet for a long time ($M = 5.5$ years). The researchers suggested that the pet owners may have considered their pet in their overall evaluation of their life, but not in their evaluation of their everyday emotions (Bao & Schreer, 2016). In contrast, a very large Canadian survey reported pet ownership to be negatively related to life satisfaction (Himsworth & Rock, 2013). However, in this study, pet ownership was associated with higher life satisfaction in the respondents who were divorced and lived alone. These findings suggest that the relationship between life satisfaction and pet ownership is dependent on the other relationships in elderly Canadians' lives (Himsworth & Rock, 2013).

Results in a large German study found a positive relationship between pet attachment and life satisfaction (Luhmann & Kalitzki, 2016). However, when controlling for demographic covariances, the relationship was found to be negative (Luhmann & Kalitzki, 2016). The researchers suggested that people who lack close human relationships, might compensate by forming a deep bond with their pet (Luhmann & Kalitzki, 2016). The researchers also proposed that the high attachment to a pet might result in the person investing little time in other human-human relationships (Luhmann & Kalitzki, 2016).

2.7 CHAPTER SUMMARY

This chapter discussed the recent literature on HAI, pet attachment, perceived stress, and life satisfaction. The relationship between these variables were also considered. Chapter 3 provides the theoretical framework relevant to the present study.

CHAPTER 3: THEORETICAL FRAMEWORK

3.1 INTRODUCTION

In this chapter, the theoretical framework for the present study is set out. An overview of the three theories used to explain the beneficial effects of HAI are discussed. These theories are the biophilia hypothesis, attachment theory, and social support theory.

A theory is an interrelated system of ideas and concepts which explains specific phenomena (Lunenburg & Irby, 2008). It provides a framework for explaining and interpreting specific social phenomena (Bryman, 2012). In spite of a great deal of research on HAI, no single prevailing theory dominates this area of study. In more recent literature, the benefits of HAI have been attributed specifically to either biophilia hypothesis, attachment theory or social-support theory (Barker, Best, & Rasmussen, 2003; Buckle, 2015; Kurdek, 2009).

One possible reason for this lack of a singular working model is that it is not an either-or situation. Our mind, body, and external environment are in constant interaction (Busch et al., 2016). Each person perceives the world from their own unique epistemologies, also loving and valuing different things. When considering the benefits of HAI from a more holistic view, the benefits people experience may manifest in different ways, for different reasons. At first glance, the amount of time and money ordinary people spend on animals appears irrational and extravagant. However, this behaviour makes more sense when we consider the wide-spread beneficial effects of HAI as well as the nonsignificant finding (See Section 2.2). The three theories will be discussed in the following sections.

3.2 BIOPHILIA HYPOTHESIS

According to the biophilia hypothesis, humans are born with an innate, genetically based desire to connect with nature and other living things

(Wilson, 1984). The biophilia hypothesis focuses on the role of this inborn tendency (Rogers, 2016). It recognises our biologically rooted desire to connection with and protect other living things (Kellert, 1993). Our awareness of the natural environment serves as an essential survival mechanism for all forms of life (Kellert, 1993). However, our biological system does not function in isolation but rather our perception is shaped by psychological and social factors (Rogers, 2016). Our perception of specific objects in the natural environment effects this emotional connection humans experience with it. This connection to nature results in a multitude of learned behaviours and psychological processes, which can be categorised as biophilia or biophobia (Kellert, 1993).

On the one hand, biophobia refers to a person's fear of things in nature, which produce physiological responses when exposed to the source of the fear (Kellert, 1993). Such sources include living things such as spiders and snakes, which can be a source of overwhelming, irrational fear for some (Rogers, 2016). This fear of specific natural phenomena is associated with negative learning behaviours, such as 'avoidance' (Ulrich, 1993). It is a natural evolutionary response to things in the environment which could pose a threat (Rogers, 2016). This includes predators, as well as animals and plants that are toxic to humans.

On the other hand, biophilia refers to the love of nature which also produces physiological responses to exposed to the source (Kellert, 1993). Neurological studies have linked these strong emotional responses to hormones such as oxytocin (Borgi & Cirulli, 2016). These living things bring about a sense of psychological, intellectual and aesthetic satisfaction (Kellert, 1993). Adults are attracted to the large eyes and small features of infants and children, which leads to a positive emotional response in the adult (Amiot & Bastian, 2015). This brings about a strong desire to protect the infant, which increases our specie's survival rates (Amiot & Bastian, 2015). Like human infants, animals are considered cute and helpless, which triggers the same emotional response to care and protect (Amiot & Bastian, 2015).

In urban society, the manifestation of humans' needs can be seen all around us, in all aspects of human life. Home and work plants, garden-bird feeders, community parks and zoos, to name a few. Through satisfaction of this biophilia need, physiological changes occur which can result in a calming effect (Borgi & Cirulli, 2016). The calming effects of HAI have been assessed by means of self-rated anxiety and fear, hormone changes, as well as reduced blood pressure and heart-rate (Allen, Blascovich, & Mendes, 2002; Barker et al., 2003; Odendaal, 2000).

Barker et al. (2003) found the presence of a fish tank to significantly reduced self-reported anxiety and fear in participants waiting for electroconvulsive therapy. Similarly, pet owners displayed significantly lower heart-rate and blood pressure response to a stress inducing task, compared to participants who were not accompanied by a pet (Allen et al., 2002). In South Africa, Odendaal (2000) found a significant increase in pet owners oxytocin levels after interacting with their pet dog in comparison to the pre-interaction scores.

The main criticism of this theory is that the research used to provide evidence for it is based on inferences made by the researchers (Schlinger, 1996), rather than being supported by empirical facts (Schlinger, 1996). This is because there is no way of testing for heritability of an invariant trait (Futuyama, 2006). In other words, without being able to pinpoint the specific genetic base for these innate desires, the theory cannot be empirically supported.

The biophilia hypothesis provides a plausible explanation for the psychological, intellectual and aesthetic satisfaction that can be experienced through HAI. It might provide an explanation for the irrational fear some people associate with specific living things.

3.3 ATTACHMENT THEORY

The attachment theory was developed by Bowlby (1977) who based his theory on the premise that humans have an innate drive to make connections with other, which starts from birth and continues through adulthood. This emotional connection, also known as attachment bonds, was originally based on the bond between mother and child (Ainsworth, 1979). Attachment bonds are characterised by providing a secure base, safe haven and proximity maintenance (Kurdek, 2009). In other words, an attachment figure is perceived to be a dependable source of support in times of distress, which provides a sense of safety and security. These bonds are also characterised by a sense of separation distress in their absence (Kurdek, 2009).

Adults' attachment styles are believed to be dependent on the extent to which a child's emotional and physical needs were perceived to be met by their primary caregiver (Ainsworth, 1979). From this perspective, the child creates their perception of their social world through interaction with early caregivers, and carry these thought patterns and behaviours into later adult life (Bartholomew, 1990). As adults, people form attachment bonds to friends or family, which can satisfy an innate need to form attachments with others. These attachment figures can provide a person with a sense of safety, stability, and support (Fraley, 2010).

Attachment theory is used to understand our psychological attachment to animals (Mikulincer et al., 2011; Rogers, 2016). Attachment theory proposes this innate desire to connect with others provides the basis from which an attachment bond forms. This can lead to the formation of a lifelong bond with other humans and non-humans (Amiot & Bastian, 2015). People can form similar attachment bonds with their pets to those shared with other humans (Kurdek, 2009; Mikulincer et al., 2011). These play an important role in psychological health, serving as a source of comfort, support, and unconditional love (Kurdek, 2009; Mikulincer et al., 2011). Studies have found dogs can serve as attachment figures, characterised by providing a secure

base, safe haven and proximity maintenance (Kurdek, 2009). This theory is further supported by other findings which also indicate pets can serve as an attachment figures, and are very often considered one of the family (Hunt & Padilla, 2006; Kaufman & Kaufman, 2006; Kurdek, 2009; Miltiades & Shearer, 2011). People experience different degrees of attachment to different animals (Zasloff, 1996). This can lead to differences in their physiological and psychological responses to the pet or therapy animal (Miller et al., 2009).

Attachment theory provides an explanation for our psychological attachment to animals (Mikulincer et al., 2011; Rogers, 2016). It also provides an explanation for the varying degrees of pet attachment people experience.

3.4 SOCIAL SUPPORT THEORY

Social support refers to the love, care and assistance a person receives from others (Beck, 2014). It has been repeatedly found to have a significantly beneficial effect on people's physical and psychological health (Albrecht & Goldsmith, 2011). From the perspective of the social support theory, humans, like many other living things, are innately socially people have an innate need to belong and form significant relationships with others (Lakey & Cohen, 2000). One of the most powerful predictors of life satisfaction is social support (Dienar, 2002; Li et al., 2014; Whitney, 2010). These relationships provide the individual with social support, offering care, reassurance and assistance, which can lead to positive feelings and overall life satisfaction (Seligman, 2011).

House and Kahn (1985) identified three types of social support. Firstly, instrumental support which includes physical and financial help. Second, emotional support which includes encouragement and comfort. Thirdly, informational support which involves providing information that might help the person solve a problem. An additional type of social support has been suggested. Companionship support, also known as diffuse support, which evokes a sense of belonging through shared activities (Wills & Shinar, 2000).

Companionship support can serve as a distraction and can improve the mood of those involved (Wan, Jaccard, & Ramey, 1996).

Social support has been found to have a beneficial effect on people in two ways (Cohen & Wills, 1985). Firstly, the direct effects model which proposes social support benefits people consistently. Secondly, the buffering hypothesis which proposes that social support provides the most benefits when people are distressed. The converse is also true, problems that occur in interpersonal relationships have been found to negatively impact people's physical and psychological health (Albrecht & Goldsmith, 2011). This has been attributed to increased stress which may occur as a result of the negative interaction (Albrecht & Goldsmith, 2011). The support received from other humans can be inconsistent and unpredictable (Albrecht & Goldsmith, 2011).

The social support theory places emphasis on animals as a source of social support and their role in facilitating social relationships among humans (McConnell et al., 2011; Risley-Curtiss, 2010). Many people form attachment bonds to their pets, often considering them as a family member (Kurdek, 2009; Miltiades & Shearer, 2011). The support and love that can be experienced through human-animal relationships is unconditional and constantly available, which offer a form of emotional support (O'Haire, 2010; Risley-Curtiss, 2010). Animals can provide a form of companionship support through shared activities such as walking and playing (Smolkovic et al., 2012). Service animals can provide a form of instrumental support play an important role in the lives of humans by offering physical support (Wiggett-Barnard & Steel, 2008). In South Africa, guide dog owners have reported increased as a result of their independence and mobility as a result of their service animal (Wiggett-Barnard & Steel, 2008).

Animals also indirectly provide social support through facilitating social interaction with other humans (Allen et al., 2011; Cohen et al., 2000; Hill et al., 2008; Horowitz, 2008; Kikusui, Winslow, & Mori, 2006; Risley-Curtiss, 2010). This has been attributed to animals' role as a social catalyst, increasing the

likelihood of social interactions among people (Fine & Beck, 2010; O'Haire, 2010). Research on AAI and pet ownership supports the notion that the presence of a friendly dog can increase social interaction among people.

3.5 CHAPTER SUMMARY

This chapter provided an overview of the three main theories used to explain the beneficial effects of HAI, namely the biophilia hypothesis, attachment theory and social support theory. Chapter 4 provides a description of the pilot study research methodology used in the present study.

CHAPTER 4: PILOT STUDY

4.1 INTRODUCTION

In this chapter, the research methodology used in a pilot study is discussed. A pilot study, also known as a preliminary study, is a small-scale version of the main study (Gallin & Ognibene, 2007). The purpose of conducting a pilot study is to identify any problems in the statistical and analytical processes before conducting the full-scale study (Gallin & Ognibene, 2007). This included assessing whether the English and Afrikaans versions of the CCAS, PSS and SWLS would yield reliable results within a South African context. Using Cronbach's alpha an assessment of the internal reliability of both the total sample and Afrikaans versions of the CCAS, PSS and SWLS were conducted.

4.2 RESPONDENTS

The final sample comprised of 59 South African adults who could read English or Afrikaans and were active Facebook users. The mean age of the respondents was 39 years ($SD = 13.77$). The respondents were between the ages of 18 and 73. The demographical information of the pilot study respondents is presented in Table 4.1 and the pet ownership information is presented in Table 4.2.

Table 4.1

Demographic Characteristics of the Pilot Study Respondent (N = 59)

| Variable | | f | % |
|-------------------|------------------------|----|------|
| Language choice | English | 48 | 84.1 |
| | Afrikaans | 11 | 18.6 |
| Gender | Female | 33 | 55.9 |
| | Male | 26 | 44.1 |
| Race | White | 53 | 89.8 |
| | Coloured | 5 | 8.5 |
| | Black | 1 | 1.7 |
| Province | Eastern Cape | 18 | 30.5 |
| | Gauteng | 9 | 15.3 |
| | KwaZulu-Natal | 2 | 3.4 |
| | North West | 2 | 3.4 |
| | Western Cape | 28 | 47.5 |
| Marital status | Married | 24 | 40.7 |
| | Single | 19 | 32.2 |
| | Divorced | 7 | 11.9 |
| | Partnered | 6 | 10.2 |
| | Widowed | 3 | 5.1 |
| Education Level | No schooling completed | 1 | 1.7 |
| | Matric | 31 | 52.5 |
| | Bachelor's degree | 19 | 32.2 |
| | Master's degree | 8 | 13.6 |
| Employment status | Full time | 39 | 66.1 |
| | Part time | 10 | 16.9 |
| | Unemployed | 2 | 3.4 |
| | Student | 3 | 5.1 |
| | Homemaker/ housewife | 2 | 3.4 |
| | Retired | 3 | 5.1 |

Note: f = frequency.

As seen in Table 4.1, the majority of this sample consisted of white (89.8%), female (55.9%) adults and the majority reported residing in the Western Cape (47.5%), Eastern Cape (30.5) and Gauteng (15.3%). Most of the respondents were employed full time (66.1%). Matric, or the equivalent, was their highest level of education (52.5%), with only 1.7% not having completed schooling. Most of the respondents were married (40.7%).

The race categories referred to in this study are for the sole purpose of reporting the descriptions of the participants. This information allows researchers to distinguish between racially different South African communities that exist as a consequence of the country's political past. These terms are not intended to be discriminatory.

Table 4.2

Pet Ownership Information of the Pilot Study Respondents (N=59)

| Variable | | f | % |
|----------------------|--|----|------|
| Pet ownership status | Yes | 42 | 71.2 |
| | No, but I have owned a pet in the past 6 months. | 3 | 5.1 |
| | No, and I have not owned a pet in the past 6 months. | 14 | 23.7 |
| Type of pet | Dog | 30 | 50.8 |
| | Cat | 12 | 20.3 |
| | Bird | 1 | 1.7 |
| | Mouse/ Rat/ Hamster | 1 | 1.7 |
| | Reptile | 1 | 1.7 |

Note: f = frequency.

As seen from Table 4.2, the respondents in this sample were mainly pet owners (76.3%). Concerning the pet owners, most were attached to a dog (50.8%), followed by a cat (20.3%).

4.3 DATA COLLECTION

Once ethical approval for the study had been granted, the pilot study data collection began. The survey (see Section 5.4.3) was distributed to 100 South African adults via Facebook and electronic mail. It was made available online for one week. Fifty completed surveys were collected but only two respondents had completed the Afrikaans version. This made an analysis of the Afrikaans versions impossible. This issue was addressed by making the survey link available online for an additional three days. Potential respondents were asked to complete the Afrikaans version if possible, and to forward it to Afrikaans speaking friends to complete. This resulted in an additional nine respondents on the Afrikaans version of the survey being collected. The data was collected using Survey Monkey (see Section 5.5.1).

4.4 STATISTICAL ANALYSIS

At the end of the data collection period, the researcher exported the data directly from Survey Monkey into Statistical Package for Social Sciences (SPSS) Version 24 for analysis. The researcher analysed the collected data.

First the frequency and percentage distributions for the demographic and pet questionnaires were tabulated (see Section 4.2). The reliability coefficients were then calculated using Cronbach's alpha. This included the coefficients for both the English versions, as well as the Afrikaans versions of the CCAS, PSS and SWLS. The original data file was then analysed by Professor Martin Kid at the Centre for Statistical Consultation to ensure that the statistical analysis was accurate.

4.4.1 Limitations

Two main issues were identified in the pilot study, which were averted in the main study. Firstly, when the survey link was sent using the electronic mail option in Survey Monkey, only the person who it was sent to could complete it. The data from the forwarded copy of the link was not recorded. The Survey Monkey call centre confirmed that this was how the system unfortunately worked. The researcher overcame this obstacle by embedding the

Facebook link onto an email. This link was found to still be active in forwarded electronic mail.

Secondly, a technical error on Survey Monkey changed the 'Honours degree' option, under the item pertaining to current level of education, to 'Professional degree'. This was changed back to the former for the main study. The pilot study proved to be highly beneficial as it identified issues the researcher was able to correct before executing the main study. This is in line with the purpose of a pilot study (Neuman, 2014).

4.5 RESULTS

In the present pilot study, the CCAS (English version) and CCAS (Afrikaans version) both had a Cronbach's alpha of 0.95. The PSS-10 (English version) and PSS-10 (Afrikaans version) had a Cronbach's alpha of 0.88 and .0.79 respectively. The SWLS (English version) and SWLS (Afrikaans version) had a Cronbach's alpha of 0.92 and 0.83. All versions of the scales were considered to have a very high degree of internal consistency

4.6 CHAPTER SUMMARY

This chapter covered the pilot study methodology used in the present study. This included a description of the respondents, data collection, statistical analysis, and results.

CHAPTER 5: METHODOLOGY: MAIN STUDY

5.1 INTRODUCTION

In this chapter, a detailed description of the research methodology used in the present study is discussed. This involves a detailed explanation of the research process used to address the research questions (Lunenburg & Irby, 2008). This includes the research design, respondents, questionnaires, data collection, and statistical analyses used. A discussion of the ethical considerations is also presented.

The aim of the present study was to investigate if there is a significant relationship between pet attachment, perceived stress, and life satisfaction in South African pet owners. Additionally, the study aimed to investigate if there is a difference in perceived stress and life satisfaction between South African pet owners and non-pet owners. The researchers also investigated whether pet attachment, perceived stress, and life satisfaction differed between age, gender, marital status, and type of pet the respondent is most attached to. The hypotheses for the present study are set out in the following section.

5.2 HYPOTHESES

In order to address the primary and secondary research questions (see Section 1.3), a number of hypotheses were formulated (Neuman, 2014). The alternative hypotheses are as follows:

Hypothesis 1

There is a significant relationship between pet attachment (CCAS), perceived stress (PSS), and life satisfaction (SWLS) of pet owners.

Hypothesis 2

There is a significant difference in perceived stress (PSS) and life satisfaction (SWLS) between pet owners and non-pet owners.

The following additional exploratory hypotheses were tested:

Hypothesis 3

Pet attachment (CCAS), perceived stress (PSS) and life satisfaction (SWLS) are significantly related to age.

Hypothesis 4

Pet attachment (CCAS), perceived stress (PSS) and life satisfaction (SWLS) differ significantly between females and male participants.

Hypothesis 5

Pet attachment (CCAS), perceived stress (PSS) and life satisfaction (SWLS) differ significantly between groups based on marital status.

Hypothesis 6

Pet attachment (CCAS), perceived stress (PSS) and life satisfaction (SWLS) differ significantly between groups based on pet type

5.3 RESEARCH DESIGN

The research design refers to the choice of research methods that will be followed to answer the research question (Chapman & Feit, 2015). Choosing a research design is of the utmost importance to obtain accurate, reliability data to answer the research question (Chapman & Feit, 2015).

The current study made use of a quantitative research design which involves the study of data that is collected in numerical form from a sample of the population of interest (Saunders, Lewis & Thornhill, 2016). It involves data being coded and analysed empirically by means of statistical analysis, which allows for inferences to be made about the population being studied (Saunders et al., 2016). Objectivity and generalisability are the main goals of quantitative research (Terre Blanch, Durrheim & Painter, 2006).

Specifically, a survey design was used that investigated the variables of interest (demographic variable, pet attachment, perceived stress and life satisfaction) of a sample of South African adults without manipulating them in any way (Passer, 2015).

This survey was cross-sectional in nature, which means it collected and analysed the data at one point in time. This approach is highly effective with regards to time, cost and practicality, in comparison to longitudinal research studies (Neuman, 2014). Online surveys are an effective way to collect data from a large population in a short period of time (Langston, 2011; Mentz, 2012). This is because the information can be collected directly from people without the researcher having to be present (Albon, 2007).

The survey made comprised of a demographic and pet ownership questionnaire, as well as standardised, self-report questionnaires. The respondents in the present study will be discussed in the following section.

5.4 RESPONDENTS

The target population comprised of South African adults (Passer, 2014). A sample was selected from the target population because it is not only impractical but also impossible to collect data from an entire population (Lunenburg & Irby, 2008).

The sampling frame was then considered which refers to all the people who could potentially participate in the study (Passer, 2014). The sampling frame in the present study consisted of South African adults who were fluent in English or Afrikaans as the survey was only provided in these two languages. These adults were also required to have access to Facebook, Twitter or electronic mail either via mobile phone, computer or tablet. Current research has found that 26 841 126 South Africans use the internet and an estimated 13 000 000 use Facebook (Internet World Stats, 2016). The exclusionary criterion in this study included people who were younger than 18 years of age and did not reside in South Africa. The reason for this exclusionary criterion was to adequately address the research question which

required the researcher to study adults living in South Africa (Gallin & Ognibene, 2007).

The sampling procedure used in the present study was convenience sampling because the sample collected was dependent on people's willingness to complete the survey. While using a convenience sample limits inferences made from the data collected, this technique allows data to be collected from a large number of respondents (Cozby & Bates, 2012). A snowball sampling technique was implemented by asking the respondents to forward the survey on to people they thought might participate (Passer, 2014). This technique is useful in gathering data from a specific population, i.e. people living in South Africa, who are essential to answering the research question (Mertens, 2005). A description of the respondents in this study will be presented in the following section.

5.4.1 Description of the respondents

A total of 3 995 responses were collected for this study, of which 666 were excluded because they were incomplete or had not met the inclusionary criteria. The mean age of the respondents was 41 years ($SD = 13.06$), ranging from 18 to 83. The demographical information of the main study's participants is presented in Table 5.1 and the pet ownership information is presented in Table 5.2.

Table 5.1

Demographic Characteristics of the Respondents (N = 3329)

| Variable | | f | % |
|-----------------|---------------|------|-------|
| Language choice | English | 2901 | 87.1 |
| | Afrikaans | 428 | 12.9 |
| Gender | Female | 2879 | 86.48 |
| | Male | 450 | 13.51 |
| Race | White | 3086 | 92.7 |
| | Indian | 101 | 3.0 |
| | Coloured | 77 | 2.3 |
| | Black | 41 | 1.2 |
| | Other* | 24 | .8 |
| Province | Eastern Cape | 216 | 6.5 |
| | Free State | 50 | 1.5 |
| | Gauteng | 1487 | 44.7 |
| | KwaZulu-Natal | 540 | 16.2 |
| | Limpopo | 48 | 1.4 |
| | Mpumalanga | 53 | 1.6 |
| | North West | 71 | 2.1 |
| | Northern Cape | 11 | .3 |
| | Western Cape | 853 | 25.6 |
| Marital status | Single | 692 | 20.8 |
| | Partnered | 647 | 19.4 |
| | Married | 1587 | 47.7 |
| | Divorced | 315 | 9.5 |
| | Widowed | 88 | 2.6 |

Table 5.1 *continued*

| | | | |
|-------------------|--------------------------|------|------|
| Education Level | No schooling completed | 52 | 1.6 |
| | Matric or the equivalent | 1481 | 44.5 |
| | Bachelor's degree | 1026 | 30.8 |
| | Honours degree | 418 | 12.6 |
| | Master's degree | 270 | 8.1 |
| | Doctor's degree | 82 | 2.5 |
| Employment status | Full time | 2227 | 66.9 |
| | Part time | 384 | 11.5 |
| | Unemployed | 133 | 4.0 |
| | Student | 140 | 4.2 |
| | Homemaker/ housewife | 249 | 7.5 |
| | Retired | 196 | 5.9 |

Note: *f* = frequency; * = Asian, Arab, Irish, Mixed, and Tanzanian.

As seen from Table 5.1, the sample consisted of mostly white (92.7%), female (86.5%) adults. Most of the respondents lived in Gauteng (44.7%), Western Cape (25.6%), and Kwazulu-Natal (16.2%). The majority of the respondents chose to complete the English version of the survey (87%). The highest level of education is either a matric certificate or an equivalent thereof (44.5%), or a bachelor's degree (30.8%). More than half of the respondents had full-time employment (66.9%) and reported being married (47.7%).

Table 5.2

Pet Ownership Information of the Respondents (N = 3329)

| Variable | | f | % |
|----------------------|--|------|------|
| Pet ownership status | Yes | 3108 | 93.4 |
| | No, but I have owned a pet in the past 6 months. | 76 | 2.3 |
| | No, and I have not owned a pet in the past 6 months. | 145 | 4.4 |
| Type of pet | Dog | 2202 | 69 |
| | Cat | 793 | 25 |
| | Other ¹ | 189 | 6 |

Note: f = frequency; ¹ = bird, fish, rabbit, guinea pig, mouse, rat, hamster, reptile, hedgehog, horse, lamb, sheep, tarantula, pig, duck, chicken, and monkey

As seen in Table 5.2, most of the sample consisted of pet owners (95.7%), who reported the pet they are most attached to is a dog (66.1%) and a cat (23.8%).

5.5 QUESTIONNAIRES

The questionnaires used in a research study are of the utmost important because they define and measure the specific variables of interest. This directly impacts the accuracy and applicability of the data being collected (Lunenborg & Irby, 2008).

The online survey, which was created by the researcher, comprised of a demographical questionnaire and three standardised self-report measures, specifically the Comfort from Companion Animal Scale (CCAS), Perceived Stress Scale (PSS), and Satisfaction With Life Scale (SWLS). Standardised questionnaires are tools utilised by psychologists, researchers and educators in applied settings (Kaufman & Kaufman, 2014). Their use allows for making more reliable comparisons between separate studies (Neuman, 2014).

Another potential benefit of using the standardised tests is that it reduces the likelihood of interviewer bias, by allowing for greater objectivity (Neuman,

2014). An essential consideration when choosing the questionnaires to use in survey research is the length of the questionnaires. The longer the survey, the lower the completion rate (Rolstad, Adler, & Ryden, 2011).

The respondents were given the option to complete the survey in English or Afrikaans, in order to make it available to a wider range of respondents. An academic translator translated the survey into Afrikaans, which is known as forward translation (De Kock, Kanjee, & Foxcroft, 2013). It was then translated back into English, known as back-translation (De Kock et al., 2013). The translated version was then compared to the original to ensure that the Afrikaans version was a valid replication of the English.

The PSS and SWLS did not require permission from the authors. The researcher received permission to use the CCAS from Dr. Lee Zasloff (personal correspondence, October 11, 2016, see Appendix F). The questionnaires are discussed in the following subsections.

5.5.1 Demographic questionnaire

The demographic questionnaire (see Appendix B) was developed by the researcher. It collected data on the respondents' age, gender, race, marital status, education level, employment status, and the province of residence. In addition, it collected the respondents' pet ownership status and the type of pet owned by the pet owners.

5.5.2 Comfort from Companion Animal Scale (CCAS)

Zasloff and Kidd (1994) developed the CCAS 11 item version (see Appendix C) to measure pet attachment by determining the perceived level of emotional comfort that a pet owner experiences from their pet, thereby focusing on the emotional facets of the HAB, such as love, trust and loyalty (Zaparanick, 2008). It was developed from the original 13-item CCAS, which showed a slight bias towards dog owners attachment, in comparison to cat owners (Zasloff & Kidd, 1994). The items on the CCAS do not refer to pet traits associated with exercise and grooming to avoid the questionnaire displaying bias towards dog owners. The CCAS 10-item was found to display no

significant difference in dog owners' attachment to their pets in comparison to cat owners' attachment to their pets (Winefield et al., 2008; Zasloff, 1996).

The CCAS consists of 11 items, each rated on a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). Examples of items on this scale are: "My pet is a source of constancy in my life" and "My pet makes me feel needed". Adding up each item's rating gives the total score of the measure. The total score ranges from 11 to 44, with a higher score representing a stronger bond.

Previous studies have found the CCAS to have a very high internal reliability (Chesney & Lawson, 2007; Mikulincer et al., 2011; Zasloff, 1996). Zasloff (1996) found the Cronbach's alpha value of .85 on the CCAS, based on a sample of Adults from the San Francisco area. Chesney and Lawson (2007) used the CCAS with a sample of teenagers in the United States and found the Cronbach's alpha to be .95. Mikulincer et al. (2011) assessed the Cronbach's alpha of the CCAS in three sub studies, using three different samples of adult, Israeli pet owners. The Cronbach alpha values for each of the sub studies were .94 ($N = 212$), .92 ($N = 134$), and .91 ($N = 93$). The CCAS has recently been successfully translated into German and used on a large sample of German adults (Luhmann & Kalitzki, 2016). The Cronbach's alpha value was found to be .87.

The construct validity was assessed by comparing the CCAS scores to those of the Lexington Attachment to Pets Scale (LAPS) on a sample of adult pet owners from Kentucky (Johnson, Garrity, & Stallones, 1992). They concluded that there was a significant correlation between the two scales measuring pet attachment of .68 ($p < .01$). Similarly, in a sample of American female pet owners, Beals (2009) found the CCAS to correlate highly with the Pet Attitude Scale ($r = .711, p < .001$). Past research using the CCAS is limited and has not been used within a South African context.

In the present study, the CCAS (English and Afrikaans versions combined) had a Cronbach's alpha score of .94 ($n = 3184$). The Afrikaans

version had a Cronbach's alpha score of .93 ($n = 417$). This suggests that both versions of the CCAS had a very high degree of internal consistency.

5.5.3 Perceived Stress Scale (PSS-10)

Cohen, Kamarck and Mermelstein (1983) developed the PSS-10 (see Appendix D). The primary aim of the PSS-10 is to assess how often the respondents find their lives unpredictable, uncontrollable, and overloaded during the course of the previous month. The 10-item version of the PSS was found to be superior to the 14-item and 4-item versions, based on a review of 19 studies that had assessed the different versions of the PSS (Eun-Hyun Lee, 2012).

The scale consists of 10 items, each ranging from 0 (never) to 4 (very frequently). Items 4, 5, 7 and 8 are reversed scores. Examples of items on this scale are: "In the last month, how often have you felt that you were unable to control the important things in your life?" and "In the last month, how often have you felt that you were on top of things?" The total Perceived Stress Score ranges from 0 to 40 and is calculated by adding up each item's rating. The higher the score, the more stressful the individuals perceive their lives to be.

Cohen et al. (1983) found the questionnaire to be reliable on a sample of American university students, with a Cronbach's alpha of .78. The PSS-10 has been found to be reliable in a number of South African studies on various samples of the South African population such as low-income adults, adults from Johannesburg, college students, employees, patients and chronic pain patients (Crandall, Steward & Warf, 2016; Harnad et al., 2008; Magalhaes Das Neves et al., 2014; Steyn & Vawda, 2014; Walker et al., 2010). The Cronbach's alpha for these studies ranges from .72 to .83 which indicates a good internal consistency. The scale also correlated with other measures of stress, such as the Job Responsibilities Scale and Life Events Scale (Cohen et al., 1983).

In the present study, the PSS (English and Afrikaans versions combined) had a Cronbach's alpha score of .90 ($N = 3329$). The Afrikaans version had a

Cronbach's alpha score of .89 ($n = 428$). This suggests that both versions of the PSS had a very high degree of internal consistency.

5.5.4 Satisfaction With Life Scale (SWLS)

Diener et al. (1985) developed the SWLS (see Appendix E) for the purpose of assessing life satisfaction. This Likert scale is made up of five items, each ranging from 1 (Strongly disagree) to 7 (Strongly agree). Sample items include: "In most ways my life is close to my ideal" and "If I could live my life over, I would change almost nothing". The measure is scored by adding up each item's rating. The total score ranges from 5 to 35 and a higher score represents a greater satisfaction with life.

The SWLS has been successfully translated into a number of different languages, such as Russian, Chinese, Dutch, Spanish, and Afrikaans (Balatsky & Diener, 1993; Le Roux & Kagee, 2008; Shao & Diener, 1992; Van Beuningen, 2012; Vázquez et al., 2012). Diener et al. (1985) found the measure to be reliable and valid. The correlation coefficient for test-retest reliability was .82 and the Cronbach's alpha was .87. The SWLS showed a moderate to high correlation with other measures assessing life satisfaction, which suggests this scale has good validity. Since then, it has proved to be a reliable and valid questionnaire for assessing satisfaction with life both internationally and in South Africa. The SWLS has been found to be reliable in a large number of studies on various samples of the South African adult population such as rural-living, medical patients, university students, general South Africans, and working adults (Burns, 2009; El-Alayli et al., 2006; Jonker et al., 2015; Keyes et al., 2008, Kruger & Sonono, 2016; Le Roux & Kagee, 2008; Nell, De Crom, Coetzee, & Van Eeden, 2015; Van Zyl & Rothmann, 2012). The Cronbach's alpha for these studies ranged from .70 to .87.

Exploratory factor analyses of the SWLS have yielded one factor, with the total explained variance ranging from 59.31% to 76% (Diener et al., 1985; Van Beuningen, 2012; Vera-Villarreal, Urzúa, Celis-Atenas & Silva, 2012; Westway, Rheeder, Van Zyl, & Seager, 2003). The factor loadings coefficients for these studies ranged between .42 to .77. Previous CFA of the SWLS have

confirmed its unifactorial structure (Vázquez et al., 2012; Vera-Villarroel et al., 2012).

In the present study, the SWLS (English and Afrikaans versions combined) proved to have a Cronbach's alpha score of .89 ($N = 3329$). The Afrikaans version had a Cronbach's alpha score of .89 ($n = 417$). This suggests that both versions of the SWLS had a very high degree of internal consistency.

5.6 DATA COLLECTION

This section provides a description of the data collection methods used to gather information that allows the researcher to answer the research questions (Wagner, Botha & Mentz, 2012).

5.6.1 Survey creation

The survey was created using Survey Monkey, an online survey development tool (SurveyMonkey, n.d.). It allows the user to create, distribute and collect data from a sample of a population of interest. Survey Monkey allows the respondents to access the survey via the web using a computer or laptop. It is also available on Android, Windows and Apple cellular telephones as an application. This makes the survey accessible to those who only have internet access on their cellular telephones or tablets. By signing up for a gold membership, Survey Monkey allowed the researcher to collect an unlimited number of response, rather than being limited to 100 responses as with the free version.

5.6.2 Survey distribution

The survey was distributed by means of electronic mail and Facebook. The link to the survey was sent to friends, family, businesses and acquaintances via electronic mail. Facebook is an online social networking and media site, which allows people to share pictures, videos, messages, and weblinks with other users (Nations, 2017). In South Africa, Facebook has a large audience with approximately 14.9 million South Africans using Facebook in December 2016, of which 92% were 18 or older (Berezowski, 2017).

The survey was sent to 400 people and 826 Groups/Pages on Facebook. Facebook allows for the survey invitation to be posted on the timeline of people, groups and pages. From there, the potential respondents were able to access the survey, as well as comment on and share the link. The invitations were sent out and made available online for four weeks. A total of 3 329 complete responses were collected.

5.6.3 Survey respondent procedure

The respondents first completed a digital consent form (see Appendix A). If they accepted, they were asked to complete the survey (see Appendices B-E). Each respondent had the option to complete the survey in either English or Afrikaans. The survey included 6 sections:

- Study details and digital consent form
- Demographic questionnaire
- Comfort from Companion Animals Scale (CCAS)
- Perceived Stress Scale (PSS)
- Satisfaction With Life Scale (SWLS)
- Comment box

Each question was needed to be completed before the following one became accessible to the respondent. Incomplete surveys were automatically discarded. All the respondents completed Section 1 (study details and digital consent form) and Section 2 (demographic questionnaire). Non-pet owners who had not owned a pet in the previous six months were directed to Section 4 (PSS), followed by Section 5 (SWLS). Pet owners, and non-pet owners who had owned a pet in the previous six months, were required to answer an additional question in the demographic questionnaire to determine what type of pet they owned. They were then directed to Section 3 (CCAS) followed by Section 4 and Section 5. Respondents who owned more than one pet, were asked to answer the questions with the pet they were emotionally closest to. They were then required to complete Section 3 (CCAS), followed by Section 4 (PSS) and Section 5 (SWLS). A

comment box was provided at the end of the survey which gave the respondents the opportunity to provide feedback.

5.7 STATISTICAL ANALYSIS

The online data was automatically captured by the Survey Monkey software and made available to the researcher. At the end of the data collection period, the researcher exported the data directly from Survey Monkey into SPSS Version 24 for analysis. SPSS is a software program that is the most commonly used in the social sciences to analyse data (Lunenburg & Irby, 2008). After the researcher had completed analysing the data, the original exported data file was sent to Professor Martin Kid at the Centre for Statistical Consultation to ensure that the statistical analysis was accurate. The descriptive statistics for the demographic and pet ownership questionnaires were first calculated (see Section 5.3.1).

The internal reliability coefficient for each version of the questionnaires were then computed, using the Cronbach's alpha. This was necessary to determine whether the CCAS, PSS and SWLS would accurately assess, and yield consistent results for the variables of interest in the current sample.

Pearson's correlations (r) were used to investigate if there is a significant relationship between pet attachment, perceived stress and life satisfaction. It is the most commonly used statistical test for correlations, measuring the relationship between variables on an interval or ratio scale (Field, 2009).

A one-way ANOVA was used to investigate whether there was a significant difference in perceived stress and life satisfaction between pet owners and non-pet owners. Running a one-way ANOVA rather than two separate t-tests would reduce the likelihood of a type 1 error (Laerd Statistics, n.d.).

Due to age being a continuous variable, Pearson's correlations were used to examine the relationships between each of the dependent variables (CCAS, PSS and the SWLS) and the respondents' age.

Three independent one-way ANOVAs were conducted to examine the difference between the CCAS, PSS and the SWLS and demographic variables such as gender, marital status, and type of pet. Fisher's Least Significant Difference (LSD) post-hoc tests were conducted when a significant between-group difference was found between more than two independent variables.

5.7.1 Interpreting the results

In large samples, it is essential to take the effect size into consideration when a significant p -value is found (Lunenburg & Irby, 2008). In large data sets, marginally significant relationships can lead the researcher to make a Type 1 error. A Type 1 error is when a significant relationship is believed to exist when there actually is not one. This is a false positive (Field, 2009), because the p -value is affected by sample size (Kaplan, Chambers & Glasgow, 2014). According to Kaplan et al. (2014), in a sample size of 150, a p -value of .05 would have an effect size of .32. In other words, 32% of the variance could be attributed to the significant p -value. While in a sample of 1500, the effect size would only be .03 (3.2%). While the p -value in the larger sample is significant, this relationship holds no practical significance.

For this reason, the effect sizes were calculated for all significant differences. The effect size indicates the strength of the association between two variables (Field, 2009). Two types of statistical tests for effect size were used. Cohen's d (d) was calculated for between-group comparisons (ANOVAs), while the coefficient of determination (r^2) was calculated for all significant relationships. According to Cohen, a d -value of below 0.20 is considered small, 0.50 is medium, and 0.8 is a large effect (Field, 2009). While a r^2 value of .10 is considered small, .30 is medium, and .50 is considered a large effect (Field, 2009). A d -value of lower than 0.20 and a r^2 value below .10 are considered negligible.

The present study considers any significant p -values with a negligible effect size as practically non-significant. Two-tailed tests were used, as the direction of the relationships were not hypothesised. A level of significance of .05 was used in the analyses.

5.8 ETHICAL CONSIDERATION

The study commenced once the researcher received ethical clearance from the Research Ethics Committee: Human Research (Humanities) Ethics Committee (SU-HSD-003803) (see Appendix G). The proposed study holds low risk as it is an internet survey, aimed at the general population. The participants were advised to contact the researcher should any of the questions upset them. The researcher referred such cases to a psychologist. The participants were directed to contact Ms Maléne Fouché [mfouche@sun.ac.za; 021 808 4622], at the Division for Research Development, for further information on their rights as a participant.

5.8.1 Informed consent

The respondents were made fully aware of the purpose of the research and were in no way coerced (see Appendix A). The participants were also explicitly informed that they were in no way obligated to participate in the study by completing the survey and that they could change their mind at any point during the survey. Due to the survey being anonymous, the researcher was unable to retract a particular participant's questionnaires once it had been completed.

Before the survey was made accessible to the potential participants, they were required to give consent by choosing to accept the invitation to participate in the study (see Appendix A). In case the potential participants did not accept to participate, they were redirected to the end of the survey. As a result, data was only collected from those who gave informed consent.

5.8.2 Anonymity and confidentiality

The names of the participants were not collected in the survey and the researcher respected the anonymity of the participants by keeping all the collected data on a password-protected computer and this for a period of five years.

5.9 CHAPTER SUMMARY

This chapter covered the methodology used in the present study to address the research questions. This included the research design; respondents; the questionnaires used, and the statistical analysis that was undertaken. The ethical considerations were then presented.

The results of the data analyses are presented in Chapter 6.

CHAPTER 6: RESULTS

6.1 INTRODUCTION

In the previous chapter, a description of the research methodology was provided. This chapter presents the results of the present study. The primary aim of this study was to investigate whether a relationship exists between pet attachment, perceived stress, and life satisfaction. The secondary aim was to investigate whether a difference exists in perceived stress and life satisfaction between South African pet owners and non-pet owners. Additional analyses aimed to determine whether pet attachment, perceived stress, and life satisfaction are influenced by age, gender, marital status, and type of pet owned. An alpha level of .05 was used for all statistical tests.

6.2 THE RELATIONSHIP BETWEEN PET ATTACHMENT, PERCEIVED STRESS, AND LIFE SATISFACTION

Pearson correlations were used to investigate the relationship between pet attachment (CCAS), perceived stress (PSS), and life satisfaction (SWLS) in the pet owners. The results of the Pearson correlations are presented in Table 6.1.

Table 6.1

Results of the Pearson Correlations for the CCS, PSS, and SWLS of the Pet Owner (n = 3184)

| | CCAS | PSS | SWLS |
|------|------|--------|---------|
| CCAS | 1 | .067** | -.001 |
| PSS | | 1 | -.572** |
| SWLS | | | 1 |

Note: * = $p < .05$; ** = $p < .01$; CCAS = Comfort from Companion Animals Scale; PSS = Perceived Stress Scale; SWLS = Satisfaction With Life Scale.

As presented in Table 6.1, a significant relationship was found between the pet owners pet attachment (CCAS) scores ($M = 40.51$; $SD = 5.10$) and their perceived stress (PSS) scores ($M = 17.99$; $SD = 7.14$). However, the effect size was found to be negligible ($r^2 = .004$). A significantly negative relationship was found between the pet owners PSS scores and their SWLS ($M = 23.41$; $SD = 6.79$). This relationship had a medium effect size ($r^2 = -.327$). No significant relationship was found between CCAS and SWLS.

6.3 DIFFERENCE IN PERCEIVED STRESS AND LIFE SATISFACTION BETWEEN PET OWNERS AND NON-PET OWNERS

A one-way ANOVA was used to compare the difference between the pet owners' and non-pet owners' perceived stress (PSS) and life satisfaction (SWLS) mean scores. The means and standard deviations scores are presented in Table 6.2.

Table 6.2

Means (M) and Standard Deviations (SD) of the PSS and SWLS scores for the Pet Owners, Non-Pet Owners, and the Total Sample (N = 3329)

| | Pet owners ($n = 3184$) | | Non-pet owners ($n = 145$) | | Total sample ($N = 3329$) | |
|------|------------------------------|-----------|---------------------------------|-----------|--------------------------------|-----------|
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> |
| PSS | 17.99 | 7.14 | 17.86 | 7.22 | 17.99 | 7.14 |
| SWLS | 23.42 | 6.79 | 22.43 | 7.25 | 23.37 | 6.81 |

Note: *M* = mean; *SD* = Standard deviation; PSS = Perceived Stress Scale; SWLS = Satisfaction With Life Scale.

According to the ANOVA analysis, there was no significant difference between pet owners' and non-pet owners' perceived stress (PSS), $F(1, 3327) = .045$; $p = .832$, or life satisfaction (SWLS), $F(1, 3327) = 2.881$; $p = .090$.

6.4. ADDITIONAL ANALYSIS

6.4.1 Age

Pearson's correlations were used to investigate the relationship between age and pet attachment (CCAS), perceived stress (PSS) and life satisfaction (SWLS). The results of the Pearson correlations are presented in Table 6.3

Table 6.3

Results of the Pearson Correlations for Age and the CCS, PSS, and SWLS (N = 3329)

| | AGE |
|-------------------------|---------|
| CCAS (<i>n</i> = 3184) | -.009 |
| PSS | -.214** |
| SWLS | -.214 |

Note: * = $p < .05$; ** = $p < .01$; CCAS = Comfort from Companion Animals Scale; PSS = Perceived Stress Scale; SWLS = Satisfaction With Life Scale.

According to Table 6.3, no significant relationship were found between age ($M = 41.56$; $SD = 12.97$) and pet attachment (CCAS) ($M = 40.51$; $SD = 5.10$) or life satisfaction (SWLS) ($M = 23.37$; $SD = 6.81$). A significant inverse relationship was found between age and perceived stress (PSS) ($M = 17.99$; $SD = 7.14$). This relationship had a negligible effect size ($r^2 = -.046$).

6.4.2 Gender

A one-way ANOVA was used to compare the difference between the female and male participants' pet attachment (CCAS), perceived stress (PSS) and life satisfaction (SWLS) mean scores. The means, standard deviation scores, and results of the one-way ANOVA are presented in Table 6.4.

Table 6.4

Results of the One-Way ANOVA for the Gender Difference on the CCAS, PSS and SWLS (N = 3329)

| Variable | Gender | M | SD | df | F | p | d |
|----------|-------------------|-------|------|------|--------|--------|-----|
| CCAS | Female (n = 2778) | 40.78 | 5.07 | | | | |
| | Male (n = 406) | 38.62 | 5.29 | 3183 | 65.221 | .000** | .42 |
| PSS | Female (n = 2879) | 18.29 | 7.09 | | | | |
| | Male (n = 450) | 16.04 | 7.16 | 3328 | 38.861 | .000** | .32 |
| SWLS | Female (n = 2879) | 23.43 | 6.79 | | | | |
| | Male (n = 450) | 23.04 | 6.98 | 3328 | 1.263 | .261 | |

Note: * = $p < .05$; ** = $p < .01$; M = mean; SD = Standard deviation; CCAS = Comfort from Companion Animals Scale; PSS = Perceived Stress Scale; SWLS = Satisfaction With Life Scale

According to Table 6.4, female pet owners scored significantly higher on pet attachment (CCAS) compared to the male pet owners. The difference had a small to medium effect size ($d = 0.42$). Female respondents also scored significantly higher than the males on perceived stress (PSS). The effect size was also considered small ($d = 0.32$). A non-significant difference was found on the SWLS between the male and female participants.

6.4.3 Marital status

A one-way ANOVA was used to determine whether pet attachment (CCAS), perceived stress (PSS) and life satisfaction (SWLS) differed between groups based on marital status. The respondents were divided into five groups based on their marital status: single, partnered, married, divorced, and widowed. The means, standard deviation scores, and results of the one-way ANOVA are presented in Table 6.5.

Table 6.5

Results of the One-Way ANOVA for the Marital Status Differences on the CCAS, PSS and SWLS (N = 3329)

| Variable | Marital status | M | SD | df | F | p |
|--------------------|---------------------|-------|------|------|--------|--------|
| CCAS (n = 3184) | Single (n = 640) | 41.07 | 4.56 | | | |
| | Partnered (n = 620) | 40.50 | 5.46 | | | |
| | Married (n = 1538) | 40.16 | 5.23 | | | |
| | Divorced (n = 303) | 40.80 | 4.95 | | | |
| | Widowed (n = 83) | 41.48 | 3.78 | 3183 | 4.737 | .001** |
| PSS (N = 3329) | Single (n = 692) | 19.35 | 7.36 | | | |
| | Partnered (n = 647) | 18.69 | 6.78 | | | |
| | Married (n = 1587) | 17.26 | 6.98 | | | |
| | Divorced (n = 315) | 17.57 | 7.53 | | | |
| | Widowed (n = 88) | 16.53 | 7.54 | 3328 | 13.305 | .000** |
| SWLS (N = 3329) | Single (n = 692) | 21.36 | 7.05 | | | |
| | Partnered (n = 647) | 23.46 | 6.55 | | | |
| | Married (n = 1587) | 24.57 | 6.60 | | | |
| | Divorced (n = 315) | 21.98 | 6.67 | | | |
| | Widowed (n = 88) | 22.10 | 6.21 | 3328 | 32.622 | .000** |

Note: * = $p < .05$; ** = $p < .01$; M = mean; SD = Standard deviation; CCAS = Comfort From Companion Animal Scale; PSS = Perceived Stress Scale; SWLS = Satisfaction With Life Scale

According to Table 6.5, a statistically significant difference was found on pet attachment (CCAS), perceived stress (PSS), and life satisfaction (SWLS) between participants in different marital status groups. Results of the LSD post-hoc analysis is presented in Table 6.6 to Table 6.8.

Table 6.6

Results of the LSD Post-Hoc for Marital Status Differences on the CCAS (n = 3184)

| (I) | (J) | M df (I-J) | Std. Error | p | d |
|-----------|-----------|------------|------------|--------|-----|
| Single | Partnered | .56704 | .28679 | .048* | .11 |
| | Married | .90933 | .23940 | .000** | .18 |
| | Divorced | .27650 | .35490 | .436 | |
| | Widowed | -.41005 | .59375 | .490 | |
| Partnered | Married | .34229 | .24211 | .158 | |
| | Divorced | -.29054 | .35674 | .415 | |
| | Widowed | -.97709 | .59485 | .101 | |
| Married | Divorced | -.63283 | .31988 | .048* | .12 |
| | Widowed | -1.31938 | .57351 | .021* | .26 |
| Divorced | Widowed | -.68655 | .63052 | .276 | |

Note: * = $p < .05$; ** = $p < .01$; M df = Mean difference; Std. Error = Standard error

According to Table 6.6, a LSD post-hoc test found that the single pet owners scored significantly higher on pet attachment (CCAS) in comparison to the partnered and married pet owners. The effect sizes were negligible.

The married pet owners scored significantly lower on pet attachment (CCAS) than the divorced and widowed pet owners. All other differences were found to be non-significant.

Table 6.7

Results of the LSD Post-Hoc for Marital Status Differences on the PSS (N = 3329)

| (I) | (J) | M df (I-J) | Std. Error | p | d |
|-----------|-----------|------------|------------|--------|------|
| Single | Partnered | .65883 | .38767 | .089 | |
| | Married | 2.08569 | .32293 | .000** | .29 |
| | Divorced | 1.77511 | .48181 | .000** | .24 |
| | Widowed | 2.81562 | .80228 | .000** | .038 |
| Partnered | Married | 1.42686 | .33065 | .000** | .21 |
| | Divorced | 1.11628 | .48703 | .022* | .16 |
| | Widowed | 2.15679 | .80542 | .007* | .031 |
| Married | Divorced | -.31058 | .43725 | .478 | |
| | Widowed | .72993 | .77634 | .347 | |
| Divorced | Widowed | 1.04051 | .85473 | .224 | |

Note: * = $p < .05$; ** = $p < .01$; M df = Mean difference; Std. Error = Standard error

According to Table 6.7, a LSD post-hoc test found the single participants scored significantly higher on perceived stress (PSS) in comparison to the married, divorced, and widowed participants. The effect sizes were small, except for the widowed participants, which was negligible.

The partnered participants scored significantly higher on perceived stress (PSS) in comparison to the married, divorced, and widowed participants. The effect sizes were small except for the difference between the partnered and divorced participants which was negligible. All other differences were found to be non-significant.

Table 6.8

Results of the LSD Post-Hoc for Marital Status Differences on the SWLS (N = 3329)

| (I) | (J) | M df (I-J) | Std. Error | p | d |
|-----------|-----------|------------|------------|--------|-----|
| Single | Partnered | -2.10046 | .36567 | .000** | .31 |
| | Married | -3.21099 | .30460 | .000** | .48 |
| | Divorced | -.62546 | .45448 | .169 | |
| | Widowed | -.74678 | .75676 | .324 | |
| Partnered | Married | -1.11053 | .31189 | .000** | .17 |
| | Divorced | 1.47500 | .45940 | .001** | .22 |
| | Widowed | 1.35368 | .75973 | .075 | |
| Married | Divorced | 2.58553 | .41245 | .000** | .39 |
| | Widowed | 2.46420 | .73229 | .001** | .37 |
| Divorced | Widowed | -.12132 | .80624 | .880 | |

Note: * = $p < .05$; ** = $p < .01$; M df = Mean difference; Std. Error = Standard error

According to Table 6.8, a LSD post-hoc test found the married participants scored significantly higher on life satisfaction (SWLS) in comparison to the single, partnered, divorced and widowed participants. The differences between the married participants compared to the single, divorced and widowed participants had a small effect size, while the difference between the married and partnered participants had a negligible effect size.

The partnered participants scored significantly higher on life satisfaction (SWLS) compared to the single and divorced participants. The effect sizes for both these group differences were small. The single participants scored the lowest on life satisfaction (SWLS). All other differences were found to be non-significant.

6.4.4 Pet type

A one-way ANOVA was used to compare the difference between pet type on the pet owners' pet attachment (CCAS), perceived stress (PSS), and life satisfaction (SWLS). The pet owners were divided into three groups based on the pet they reported being most attached to: dog, cat, and other animal groups. Results of the One-Way ANOVA are presented in Table 6.9.

Table 6.9

Results of the One-Way ANOVA for the Type of Pet Differences on the CCAS, PSS and SWLS (n = 3184).

| Variable | Type of pet | M | SD | df | F | p |
|----------|------------------------------|-------|------|------|-------|--------|
| CCAS | Dog (n = 2202) | 40.71 | 4.99 | 3183 | 6.509 | .002** |
| | Cat (n = 793) | 39.95 | 5.46 | | | |
| | Other ¹ (n = 189) | 40.53 | 4.66 | | | |
| PSS | Dog (n = 2202) | 17.63 | 7.07 | 3183 | 9.145 | .000** |
| | Cat (n = 793) | 18.69 | 7.27 | | | |
| | Other ¹ (n = 793) | 19.15 | 7.05 | | | |
| SWLS | Dog (n = 2202) | 23.76 | 6.62 | 3183 | 9.670 | .000** |
| | Cat (n = 793) | 22.55 | 7.11 | | | |
| | Other ¹ (n = 793) | 23.00 | 7.01 | | | |

Note: * = $p < .05$; ** = $p < .01$; ¹ = bird, fish, rabbit, guinea pig, mouse, rat, hamster, reptile, hedgehog, horse, lamb, sheep, tarantula, pig, duck, chicken, and monkey. M = mean; SD = Standard deviation; df = total degrees of freedom; CCAS = Comfort from Companion Animal Scale; PSS = Perceived Stress Scale; SWLS = Satisfaction With Life Scale

According to Table 6.9, a statistically significant difference was found on pet attachment (CCAS), perceived stress (PSS), and life satisfaction (SWLS) between different types of pets.

A LSD post-hoc test found that the pet owners in the dog group scored significantly higher on pet attachment (CCAS) in comparison to the cat group. However, the effect size was negligible ($d = 0.15$). All other differences were found to be non-significant.

A LSD post-hoc test found that the pet owners in the dog group scored significantly lower on perceived stress (PSS) in comparison to the cat group ($d = 0.15$) and the other pet group ($d = 0.22$). The effect size between the dog and cat group was considered negligible but between the dog and other group it was considered small. All other differences were found to be non-significant.

A LSD post-hoc test found that the pet owners in the dog group scored significantly higher on life satisfaction (SWLS) in comparison to the cat group ($d = 0.18$). This effect size was negligible. All other differences were found to be non-significant.

6.5 CHAPTER SUMMARY

This chapter covered the results of the various statistical analyses conducted on the collected data. The results of the statistical tests used to address the research questions were first reported. This was followed by the results of the additional analysis which investigated pet attachment, perceived stress and life satisfaction in terms of age, gender, marital status and type of pet. The results of the data analyses will be discussed in Chapter 7.

CHAPTER 7: DISCUSSION, LIMITATIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

In the previous chapter, the results of the data analyses were presented. This chapter provides a summary of the study, a discussion of the results, as well as the limitations and recommendations for future research.

7.2 SUMMARY OF THE STUDY

There is overwhelming evidence that suggests pets can have a beneficial effect on physical, psychological, and social aspects of human functioning (Wells, 2009). In South Africa, the majority of the research focuses on the effects of AAI, especially on homogeneous populations such as medical patients and elderly retirement-home residents (Buckle, 2015; Coetzee et al., 2013; Le Roux & Kemp, 2009; Lubbe & Scholtz, 2013). Studies such as these have provided a greater understanding of the effect of AAI on samples of South Africans. There is very limited literature on pet ownership and pet attachment in a South African context (Gerber, 2016).

The current study used three theories to conceptualise HAI. Firstly, the biophilia hypothesis which attributes people's attachment to their pets to an innate desire to connection with and protect other living things (Kellert, 1993). Satisfaction of this desire brings about a sense of psychological, intellectual and aesthetic satisfaction (Kellert, 1993). This in turn can lead to calming effects (Allen, Blascovich & Mendes, 2002; Barker et al., 2003; Odendaal, 2000).

Secondly, the attachment theory attributes the relationship between people and their pets to the satisfaction of an innate desire to form emotional bonds (Mikulincer et al., 2011; Rogers, 2016). Pets can serve as attachment figures that can play an important role in psychological health,

serving as a source of comfort, support, and unconditional love (Kurdek, 2009; Mikulincer et al., 2011).

Lastly, the social support theory suggests that people have an innate need to belong to and form significant relationships with others (Lakey & Cohen, 2000). Pets can serve as an extension of a person's social network, which can provide an unconditional and constantly available form of emotional support (Lakey & Cohen, 2000; O'Haire, 2010; Risley-Curtiss, 2010). Additionally, pets can provide social support through facilitating social interaction with other humans (Allen et al., 2011; Risley-Curtiss, 2010).

The current study used a quantitative survey design to investigate whether there is a relationship between pet attachment, perceived stress, and life satisfaction in South African pet owners. It also investigated whether there is a difference in perceived stress and life satisfaction between South African pet owners and non-pet owners. Additional exploratory analyses were conducted to determine if pet attachment, perceived stress, and life satisfaction, differed according to age, gender, marital status, and type of pet.

As a preliminary step, a pilot study was conducted. The pilot study sample consisted of 59 South African adults. The respondents were mostly white (89.8%), female (55.9%) pet owners (76.3%). The purpose of the pilot study was to identify problems in the statistical and analytical processes before conducting the full-scale study. The Cronbach's alphas were calculated for all three standardised questionnaires used in the survey. Both versions of the CCAS, PSS and SWLS were found to have a high degree of internal reliability.

Two problems were identified and addressed before the main study commenced. Firstly, the survey link had to be embedded onto the electronic mailed survey invitation so that the survey link would be active when respondents forwarded it to other people. Secondly, changes were made to the item pertaining to current level of education,

Survey Monkey was used to create the survey and collect the data via Facebook and electronic mail. The survey included a demographical and pet-ownership questionnaire, and three standardised self-report measures, namely the CCAS, PSS, and SWLS. The respondents had the option to complete the survey in either English or Afrikaans. The collected data was automatically captured online by the Survey Monkey software and exported as well as to SPSS for analyses.

The main study sample consisted of 3 329 South African adults. The respondents were mostly white (92.7%), female (86.5%) pet owners (97.7%). The collected data was analysed using SPSS. The descriptive statistics and Cronbach's alphas were first calculated. Pearson's correlations and one-way ANOVAs were then used to address the research questions and additional exploratory analyses. A level of significance of .05 was used in the analyses. The effect size, using Cohens d (d), was calculated for all significant between-group differences. The coefficient of determination (r^2), was calculated for all significant relationships. All negligible effect sizes were considered practically non-significant.

7.3 DISCUSSION OF THE RESULTS

The current study considered any significant p -values with a negligible effect size as practically non-significant. Two-tailed tests were used, as the direction of the relationships were not hypothesised. A level of significance of .05 was used in the analyses.

7.3.1 The relationship between pet attachment, perceived stress and life satisfaction

The current study found a significant positive relationship between pet attachment and perceived stress with a negligible effect size ($r^2 = .004$) (see Table 6.1). While the p -value was significant, considering the extremely negligible effect size and large sample size, this relationship cannot be assumed to be practically significant (Field, 2009).

This finding contradicts previous research on the relationship between pet attachment and perceived stress (Koontz, 2009; Wen Li., 2017). Koontz's (2009) study found no significant relationship between pet attachment and perceived stress. This study differed from the current study in that the sample comprised of single American mothers, while the majority of the current sample were married South Africans of both genders (48.3%). Further contradictory findings were reported in Wen Li et al. (2017) who found Malaysian pet owners with high pet attachment scores, scored significantly lower on perceived stress in comparison to those with low pet attachment scores. The researchers suggested that pet owners with high pet attachment scores might be more likely to receive social support from their pets, in addition to the social support they receive from friends and family (Wen Li et al., 2017).

The Wen Li et al. (2017) study further differed from the current study and Koontz (2009) in that it used the LAPS to assess pet attachment, as opposed to the CCAS (Wen Li et al., 2017). The current study and that of Koontz (2009) were similar in that the pet owners had a high mean pet-attachment score ($M = 40.51$; $SD = 5.1$). The Wen Li et al. (2017) study differed in that the mean pet attachment score was considered moderate

It is important to note that the very low effect size suggests a high probability of a Type 1 error in this finding (Field, 2009). The studies of Koontz (2009) and Wen Li et al. (2017) did not report the effect size and their sample sizes were small ($N = 202$; $n = 80$).

The current study found no significant relationship between pet attachment and life satisfaction (see Table 6.1). This finding is consistent with those in El-Alayli et al. (2006) who found a non-significant relationship between pet attachment and life satisfaction. The current study collected data from South African adults from the general population while the El-Alayli et al. (2006) study collected data from a small sample ($N = 70$) of pet-owning American university students.

In contrast, in a sample of German pet owners, a negative relationship was found between pet attachment and life satisfaction (Luhmann & Kalitzki, 2016). The researchers suggested that people who lack close human relationships might compensate by forming a deep bond with their pet (Luhmann & Kalitzki, 2016). The researchers also proposed that the high attachment to a pet might result in the person investing little time in other human-human relationships (Luhmann & Kalitzki, 2016). Luhmann and Kalitzki, (2016) included dog, cat and horse owners, while the current study took into consideration any animal a person considered to be their pet.

The El-Alayli et al. (2006) study assessed pet attachment using the Pet Attachment Scale (PAS) and the Companion Animal Bonding scale (CAB). The current study, as well as Luhmann and Kalitzki (2016), used the CCAS. The SWLS was used to assess life satisfaction in all three studies. This suggests that the conflicting and supporting findings were independent of the questionnaires used in the research.

The findings in the current study suggest that pet attachment does not have any practical relationship to life satisfaction and perceived stress. This can be explained by the attachment theory and the social support theory (Kurek, 2009). According to attachment theory, the attachment between a human and an animal can provide a secure base and safe haven, which provides a sense of safety and security (Kurdek, 2009). This in turn can have a beneficial effect on perceived stress and life satisfaction of the owner. However, if these bonds are characterised by distress as a result of separation, it may have a negative impact on the beneficial aspects of the relationship (Kurdek, 2009).

According to the Social Support theory, pets can also provide social support through facilitating social interaction with other humans (Allen et al., 2011; Risley-Curtiss, 2010). Pet owners with lower pet attachment might experience social support benefits through their pet by facilitating social interaction with other humans (Allen et al., 2011; Risley-Curtiss, 2010).

The current study also found a significant inverse relationship between the perceived stress and life satisfaction with a medium effect size ($r^2 = .33$) (see Table 6.1). This finding is consistent with past research, which also found a significant inverse relationship between the perceived stress and life satisfaction (Samaha & Hawi, 2016; Schiffrin & Nelson, 2010; Surujlal et al., 2013; Walker et al., 2010). These researchers used a variety of samples, such as American university students, South African students and South African chronic pain patients.

The negligible relationship between pet attachment and perceived stress, and the non-significant relationship between pet attachment and life satisfaction can be explained by the Social Support theory. According to the buffering hypothesis, social support provides the most benefits when people are distressed (Cohen & Wills, 1985).

7.3.2 Difference in perceived stress and life satisfaction between pet owners and non-pet owners

The current study found a non-significant difference in perceived stress and life satisfaction between pet owners and non-pet owners (see Table 6.2). The biophilia hypothesis provides a possible explanation for the non-significant difference between pet owners and non-pet owners in terms of perceived stress and life satisfaction. The calming effect of satisfying our innate desire to connect with other living things not only applies to domesticated or tame animals (Kellert, 1993). This need can also be satisfied by connecting with other forms of living things such as gardening, hiking through nature or visiting zoos (Kellert, 1993). The non-pet owners in this sample may have experienced similar calming effects through other means other than pet ownership.

In accordance with the buffering hypothesis of the Social Support theory, the benefits of pet ownership may only be apparent in people who lack social support provided by a partner or spouse.

The findings in the current study confirms that of Wen Li et al. (2017) who also found a non-significant difference in perceived stress between pet owners and non-pet owners. Unlike the current study, the majority of the pet

owners in the Wen Li et al. (2017) study reported low pet attachment scores. These results differ from a number of cross-sectional studies on pet ownership in Jordan, the USA and Mexico, which found significantly lower perceived stress levels in pet owners in comparison to non-pet owners (Lee & Chai, 2015; McConnell et al., 2011; Ramirez & Hernandez, 2014).

In the current study and that of Wen Li et al. (2017), the majority of the participants were married or partnered. However, the Lee and Chai (2015), as well as Ramirez and Hernandez (2014) studies differed from the current study and Wen Li et al. (2017) in that most of the respondents were single. Single people might lack the social support provided by a partner (Staats et al., 2006). In accordance with the social support theory, pets have been found to satisfy the social needs of the people that care for them by acting as friends, providing unconditional love and acceptance (Hill et al., 2008; Nebbe, 2001). These findings suggest that the relationship between life satisfaction and pet ownership might be dependent on marital status.

The findings in the current study confirms that of El-Alayli et al. (2006), Mháistir (2013), and Ramirez and Hernandez (2014) who also found a non-significant difference in life satisfaction between pet owners and non-pet owners. These researchers used a variety of samples that differed from the current study, namely Mexican adults, Irish elderly and American university students. These results differ from Bao and Schreer (2016), as well as Luhmann and Kalitzki (2016) who found that pet owners scored significantly higher on life satisfaction compared to the non-pet owners.

In the current study and that of Mháistir (2013), the majority of the participants were married or partnered. In the studies by Bao and Schreer (2016), and Luhmann and Kalitzki (2016), the majority of the respondents were young, single adults. Findings in Himsworth and Rock (2013) support this notion. The researchers found an inverse relationship between pet ownership and life satisfaction in their total sample (Himsworth & Rock, 2013). However, in the participants who were divorced and lived alone, pet ownership was positively related to life satisfaction (Himsworth & Rock, 2013)

7.3.3 Additional analysis

7.3.3.1 Age differences

The current study found no significant relationship between age and pet attachment (see Table 6.3). This finding is in accordance with past research, which has found high pet attachment in people of all ages (Mueller, 2014). Gerber (2016) also found that pet attachment was not related to age in a sample of South African student pet owners. Both the current study and that of Gerber (2016) consisted of South African pet owners with high pet attachment scores.

Gerber's (2016) study differed from the current study in that the sample comprised of Stellenbosch University students while the current study sample comprised of pet owners from the general population, from all nine provinces in South Africa. The respondents in the Gerber (2016) study had a mean age of 23 years ($SD = 3.71$), while the respondents in the current study had a mean age of 41 years ($SD = 13.06$). Additionally, these studies differed in terms of the questionnaires they used to assess pet attachment, namely the CCAS and LAPS (Gerber, 2016).

The current study found a significantly inverse relationship between age and perceived stress with a negligible effect size ($r^2 = .046$) (see Table 6.3). Past research on American adults from the general population, American elderly, Taiwanese nurses and South African nurses also found perceived stress to decrease with age (Chianga & Changa, 2012; Cohen & Janicki-Deverts, 2012; Nordin & Nordin, 2013; Stone et al., 2010; Van der Colff & Rothmann, 2014). This negative relationship between perceived stress and age has been attributed to older people perceiving daily hassles as less stressful and have developed more effective ways of coping (Cohen & Janicki-Deverts, 2012).

When taking into consideration the negligible effect size, the relationship has no practical significance in the current sample. In Diehl and Hay (2010) as well as Be Lue et al. (2008), a non-significant relationship between age and perceived stress was found in American adults and South

African mothers respectively. The current study, Be Lue et al. (2008), Chianga and Changa (2012), Nordin and Nordin (2013) used the PSS. This suggests that the conflicting and supporting findings were independent of the questionnaires used in the studies.

The current study found no significant relationship between age and life satisfaction (see Table 6.3). This finding is consistent with previous research in Latvia, Sweden, Germany, and Spain, which also found no relationship between age and life satisfaction (Baird et al., 2010; Realo & Dobewall, 2011; Vázquez et al., 2012).

The findings in the current study conflict with those in Le Roux and Kagee (2008) who found a positively significant relationship between age and life satisfaction in South African adults. The sample in Le Roux and Kagee (2008) comprised of black adults with hypertension and diabetes, which can be considered a vulnerable population due to their medical conditions, while the current study comprised of mostly white adults collected from the general population. The conflicting findings could be due to the different samples of South Africans who were studied.

7.3.3.2 Gender differences

The current study found significantly higher pet attachment in female pet owners in comparison to the male pet owners, with a small effect size ($d = 0.42$) (see Table 6.4). It should be noted that this effect size was just below a medium effect size of 0.5.

This finding is consistent with past research which has found higher pet attachment in female respondents in comparison to male respondents (Andreassen et al., 2013; Gerber, 2016; Lewis et al., 2009; Lue et al., 2008; Smolkovic et al., 2012; Winefield et al., 2008). These studies used a variety of samples, such as Australian elderly, Slovenian adults, New Zealander university students, South African university students, and American pet owners. These studies differed from the current study in terms of the questionnaires used to assess pet attachment which included the OPRS,

CABS, LAPS and PAQ (Andreassen et al., 2013; Gerber, 2016; Lewis et al., 2009; Lue et al., 2008; Smolkovic et al., 2012; Winefield et al., 2008).

The current study collected data from a sample of adults from the South African general population while Gerber (2016) collected data from a sample of South African university students. Additionally, the current study used the CCAS to assess pet attachment while Gerber (2016) used the LAPS. Women appear to score higher on pet attachment than their male counterparts regardless of the questionnaires used. A possible reason for the higher pet attachment in women, is their maternal characteristics being extended from babies to pets (Prato-Previde, Fallani & Valsecch, 2006).

However, some studies have found a non-significant difference in pet attachment between genders (Fallani et al., 2006; Herzog 2007). The study of Fallani et al. (2006) reported no significant difference in pet attachment between male and female respondents in a sample of volunteers from a veterinary clinic. The respondents scored very high on pet attachment which is expected as they volunteer in assisting animals (Fallani et al., 2006).

The current study found significantly higher perceived stress in female pet owners comparison to the male participants, with a small effect size ($d = 0.32$). This finding in the current study confirms previous research in South African in Bhat and Basson (2013), Hamad et al. (2008), and Vawda (2003), who also found the female respondents scored significantly higher on perceived stress compared to their male counterparts. The current study collected data from the general population, Vawda (2003) and Bhat and Basson (2013) collected data from dental students, while Hamad et al. (2008) collected data from low-income adults.

The researchers used a number of questionnaires to assess perceived stress (Bhat & Basson, 2013; Hamad et al., 2008; Vawda, 2003). The current study and that of Hamad et al. (2008) used the PSS to assess perceived stress. However, Bhat and Basson (2013), and Vawda (2003) used the Dental Environment Stress (DES) questionnaire (Garbee, Zucker & Selby, 1980) and the Stress Symptom Checklist (SSCL; Schlebusch, 2004) respectively.

The findings in the current study conflict with those in Van der Colff and Rothmann (2014) who found a non-significant difference in perceived stress between male and female South African nursing staff. In Van der Colff and Rothmann (2014), 2.6% of the participants were male, which might account for the conflicting findings. The study in Van der Colff and Rothmann (2014) used the Nursing Stress Indicator (NSI) (Spielberger, Vagg, & Wasala, 2003), which differed from the current study's questionnaire used to assess perceived stress.

The current study found a non-significant difference in life satisfaction between female and male participants. This finding confirms that of Kayitesi and Mwaba (2014), Le Roux and Kagee (2008), Patel et al., (2009), as well as Vázquez et al. (2012). These studies used samples from a variety of social and cultural environments, including Black South Africans with chronic illness, Black South African students, White South African Christians, as well as Spanish adults (Kayitesi & Mwaba, 2014; Le Roux & Kagee, 2008; Patel et al., 2009; Vázquez et al., 2012). These studies were similar to the current study in that they all used the SWLS except in Kayitesi and Mwaba (2014), which used the Temporal Satisfaction with Life Scale (TSWLS; Pavot, Diener, & Suh, 1998).

However, the current study's finding conflicts with those in Jackson et al. (2014) who found higher life satisfaction in female South African students compared to their male counterparts. The researchers attributed this difference to female students who might see more opportunities in a post-apartheid South Africa. The current study was similar to Jackson et al. (2014) in that they both assessed life satisfaction using the SWLS, suggesting the conflicting results were not as a result of the questionnaires used to assess life satisfaction.

7.3.3.3 Marital status

The current study found a significant difference in pet attachment, perceived stress, and life satisfaction between different marital-status groups (see Table 6.5).

In the current study, pet attachment was significantly lower in the married pet owners compared to the single ($d = 0.18$), divorced ($d = 0.12$) and widowed ($d = 0.26$) pet owners. The effect sizes were either small or just below a small effect size of 0.2, suggesting a small practical significance. These findings are consistent with past research which has found lower pet attachment in people who do not have a partner (Staats et al., 2006). Staats et al. (2006) found higher pet attachment scores in people who lived alone or were divorced in comparison to married people and those who lived with others. Single people and those who live alone could lack the support of a partner or spouse, which might be provided by a pet (Staats et al., 2006). Similarly, in Lue et al. (2008) stronger attachment bonds were found in dog owners who had no children under the age of 18 living at home compared to those who do have children living at home.

The current study found significantly lower perceived stress in the married respondents compared to the single participants ($d = 0.29$) with a small effect size. The findings in the current study are consistent with Muirhead and Locker (2007) who found lower perceived stress in married Canadian dental students compared to their unattached counterparts. The support provided by one's partner could provide a strong source of social support (Muirhead & Locker, 2007). This could assist in buffering the negative effect of stress, which could have a beneficial effect on life satisfaction (Muirhead & Locker, 2007). The study of Muirhead and Locker (2007) differed from the current study in that it used the DES to assess perceived stress while the current study used the PSS.

The findings in the current study conflict with those in Basson et al. (2013) who found that married South African dental students scored higher on perceived stress in comparison to the other relationship statuses. The researchers suggested that the added family responsibilities and duties of the married students may have contributed to the higher perceived stress.

The findings in the current study also conflict with those in Be Lue et al. (2008) who found that marital status was not related to perceived stress in a sample of young South African mothers living in an informal township. The

current study and Be Lue et al. (2008) both used the PSS to assess perceived stress which suggests the conflicting results were not caused by the questionnaires used. In Be Lue et al. (2008) more than half of the women felt they could not depend on their partner for support, which could explain the contradictory finding. This suggests that the quality of the relationship may influence the relationship between marital status and perceived stress.

The current study found married participants scored significantly higher on life satisfaction in comparison to the single ($d = 0.48$), partnered ($d = 0.17$), divorced ($d = 0.39$), and widowed ($d = 0.37$) participants. The findings in the current study are consistent with past research, which suggests married people experience greater life satisfaction in comparison to other marital statuses (Cavanaugh et al., 2008; Dolan et al., 2008; Frey, 2008; Soons & Kalmijn, 2009; Stanca, 2009). Past research has attributed this to the emotional and financial protective factors accompanied by marriage (Gove et al., 1990; Stutzer & Frey, 2006). These factors include the sharing of household responsibilities, reduced chance of loneliness and providing a source of social support (Gove et al., 1990; Stutzer & Frey, 2006).

7.3.3.4 Type of pet

The current study found a significant difference in pet attachment, perceived stress, and life satisfaction between pet owners of different types of pets (see Table 6.9).

In the current study the pet owners in the dog group scored significantly higher on pet attachment in comparison to the cat group, with a negligible effect size ($d = 0.15$). No significant difference was found in pet attachment between dog owners and other pets. This is consistent with past research which found humans form strong bonds with many different types of animals (Kurdek, 2009; Sable, 2013). Some research suggests that dog owners are more attached to their dogs than other types of pet owners (Smolkovic et al., 2012; Winefield et al., 2008). This could be as a result of dogs having evolved together with humans (Mueller, 2014). In adults, pet owners who owned both a cat and a dog, significantly more participants reported being more

attached to their dog. More care required by dogs could contribute to a higher pet attachment in dog owners (Smolkovic et al., 2012).

In the current study, the pet owners in the dog group scored significantly lower on perceived stress in comparison to the cat group ($d = 0.15$) and the other pet group ($d = 0.22$). The effect size between the dog and cat group was considered negligible but between the dog and other group it was considered small.

In the current study, the pet owners in the dog group also scored significantly higher on life satisfaction in comparison to the cat group ($d = 0.18$). This effect size was negligible. The slightly lower perceived stress and higher life satisfaction in the dog group might be caused by their slightly higher pet attachment.

7.4 LIMITATIONS AND RECOMMENDATIONS

In every research study, there are factors which may affect the interpretation of the results and the inferences made from them (Lunenburg & Irby, 2008). The strengths, limitations and recommendations for the current study are presented in this section.

7.4.1 Strengths

- A pilot study was conducted which enabled the researcher to identify problems in the data collection and distribution procedures. These problems were then addressed before the main study was executed. The pilot study also gave the researcher the opportunity to assess the internal reliability of both the English and Afrikaans versions of the CCAS, PSS and SWLS.
- The respondents were given the option to complete the survey in English or Afrikaans, which make it available to a wider range of respondents.
- The standardised questionnaires used in this study were all found to have a very high degree of internal reliability, in the pilot and main study. This suggests the data extracted was reliable.

- The survey was created and distributed using Survey Monkey. This allowed the researcher to create a visually appealing survey to attract the attention of potential respondents. Furthermore, the use of the paid version of Survey Monkey allowed the researcher to collect an unlimited amount of responses.
- The survey was distributed amongst 836 South African Facebook groups and pages. This gave the researcher access to a diverse sample of respondents from all nine provinces of South Africa who varied in age, gender, education levels, employment, marital status and type of pet owned.
- Data was collected from a large sample of South African's which gave the results more statistical power (Field, 2009).
- The current study contributes to filling a gap in South African literature, with regards to pet ownership, pet attachment, perceived stress, and life satisfaction.

7.4.2 Limitations

- The sample lacked racial and gender diversity. Additionally, only a very small portion of the sample consisted of non-pet owners. This implies that generalisations to the general population were limited.
- The survey was only offered in English and Afrikaans, which might account for the lack of cultural diversity in the sample.
- The respondents' home language was not collected, which prevented the researcher from determining how many Afrikaans respondents chose to complete the English version of the survey.
- The present study only compared the pet the respondent was most attached to. The number of pets or more than one species of pet was not taken into consideration.
- The high mean pet-attachment score may be caused by a self-selection bias. Pet owners with a high pet attachment might have been more motivated to complete the survey than pet owners with a

low pet attachment. These results are therefore only representative of pet owners with a high pet attachment.

- The current study did not consider the difference in perceived stress and life satisfaction between pet owners with a high pet attachment and those with a low attachment to their pet.

7.4.3 Recommendations

- Future studies should consider using a lucky draw to collect a more diverse sample.
- Providing an option to complete the survey in other African languages might assist in collecting a more culturally diverse sample.
- Providing an option for people who own more than one different type of pets might better explain the effect of these relationships.
- Collecting the respondents' home language would allow future researchers to determine if people chose to complete the questionnaire or survey in their home language or a different language.
- The use of stratified random sampling in future research will lead to a more representative sample and reduced sampling error (Neuman, 2014).
- The CCAS was found to have an exceptionally high reliability and mean score. Further investigation using the CCAS with additional pet attachment questionnaires is recommended.

7.5 CONCLUSION

International research on pet ownership has found a wide array of physical, psychological and social benefits as a result of HAI (Beetz et al., 2012). In spite of South Africa's declining political and economic situation, South Africa has an estimated 9.2 million pet dogs (Maharaj, 2017). People form attachments to all types of animals which is clear in this study from the wide array of pets that were reported. These included birds, fish, rabbits, guinea pigs, mice, rats, hamster, reptiles, hedgehogs, horses, lamb, sheep, tarantulas, pigs, ducks, chicken, and monkeys. Additionally, the pet attachment scores in the current study were very high which further supports the notion that there are many South Africans who have a strong attachment to their pets.

The primary research question was: *Is there a relationship between pet attachment, perceived stress, and life satisfaction in a sample from the South African population?* Findings in the present study do not support the notion that pet attachment is directly related to perceived stress or life satisfaction in South African pet owners.

The secondary research question was: *Is there a difference in perceived stress and life satisfaction between pet owners and non-pet owners in a sample from the South African population?* Findings in the present study also suggests that pet owners and non-pet owners do not differ in terms of perceived stress and life satisfaction.

It is important to note that while the benefits of pet ownership were not apparent in these findings, the benefits might be more apparent in specific samples of the population such as those who do not have adequate access to social support. The majority of the current sample were either married or partnered, which might account for the non-significant findings. The results may be different in vulnerable populations of South Africans or those who are unmarried or live alone. The additional exploratory analysis found that age was related to pet attachment, perceived stress, and life satisfaction. It also found significant differences in pet attachment, perceived stress, and life

satisfaction between groups based on gender, marital status, and type of pet owned.

The current study contributes to filling a gap in South African literature, with regards to pet ownership, pet attachment, perceived stress, and life satisfaction. However, there is still a need for further investigation of pet ownership and attachment within a South African context in order to gain a better understanding of this complex relationship.

References

- Adrian, J. A., Deliramich, A. N., & Frueh, B. C. (2009). Complicated grief and posttraumatic stress disorder in humans' response to the death of pets/animals. *Bulletin of the Menninger Clinic, 73*, 176-187.
doi:10.1521/bumc.2009.73.3.176
- Ainsworth, M. S. (1979). Infant-mother attachment. *American Psychologist, 34*(10), 932-937. doi:10.1037/0003-066X.34.10.932
- Akintola, O., Dageid, W., & Hlengwa, W. M. (2013). Perceived stress and burnout among volunteer caregivers working in AIDS care in South Africa. *Journal of Advanced Nursing, 69*(12), 2738-2749. doi:10.1111/jan.12166
- Al-Awadi, H., Hunt, M., & Johnson, M. (2008). Psychological sequelae of pet loss following hurricane Katrina. *Anthrozoös, 21*, 109-121.
doi:10.2752/175303708X305765
- Albon, A. (2007). *Introducing psychology through research*. New York, NY: Open University Press.
- Albrecht, T. L., & Goldsmith, D. J. (2003). Social support, social networks, and health. In A. Dorsey, K. Miller, R. Parrott, & T. Thompson (Eds.), *Handbook of health communication* (pp. 263-284). Mahwah, NJ: Lawrence Erlbaum Associates.
- Allen, K., Blascovich, J., & Mendes, W. B. (2002). Cardiovascular reactivity and the presence of pets, friends, and spouses: The truth about cats and dogs. *Psychosomatic Medicine, 64*(5), 727-739. Retrieved from <http://wendyberrymendes.com/cms/uploads/Allen2002-%20Cardiovascular%20reac.pdf>
- Allen, K. M., Barker, S. B., & Friedmann, E. (2011). Physiological correlates of health benefits from pets. In P. McCardle, S. McCain, J. A. Griffin, & V. Maholmes (Eds.), *How animals affect us: Examining the influence of human-animal interaction of child development and human health* (pp. 163-182). Washington, DC: American Psychological Association.

- American College Health Association. (2015). *National college health assessment II: Reference group executive summary*. Hanover, MD: American College Health Association. Retrieved from http://www.acha-ncha.org/docs/NCHA-II_WEB_SPRING_2015_REFERENCE_GROUP_EXECUTIVE_SUMMARY.pdf
- American Institute of Stress [AIS]. (2017). *Stress effects*. Retrieved from <https://www.stress.org/stress-effects/>
- American Psychology Association [APA]. (2015). *APA dictionary of psychology* (2nd ed.). Washington, DC: American Psychology Association.
- American Society for the Prevention of Cruelty to Animals. (2015). *About us: Species suitable to be companion animals*. Retrieved from <https://www.aspca.org/about-us/aspca-policy-and-position-statements/species-suitable-to-be-companion-animals>
- American Veterinary Medical Foundation [AVMA]. (2017). *Animal-assisted interventions: Definitions*. Retrieved from <https://www.avma.org/KB/Policies/Pages/Animal-Assisted-Interventions-Definitions.aspx>
- Amiot, C. E., & Bastian, B. (2015). Toward a psychology of human-animal relations. *Psychological Bulletin*, 141(1), 6-47. doi:10.1037/a0038147
- Anderson, D. C. (2007). *Assessing the human-animal bond: A compendium of actual measures*. West Lafayette, IN: Purdue University.
- Anderson, K. A., Lord, L. K., Hill, L. N., & McCune, S. (2015). Fostering the human-animal bond for older adults: Challenges and opportunities. *Activities, Adaptation & Aging*, 39(1), 32-42. doi:10.1080/01924788.2015.994447
- Andreassen, G., Stenvold, L. C., & Rudmin, F. W. (2013). My dog is my best friend: Health benefits of emotional attachment to a pet dog. *Psychology & Society*, 5(2), 6-23. Retrieved from http://www.psychologyandsociety.org/__assets/__original/2013/04/2.pdf

- Antonacopoulos, N. M. D. (2009). *The effects of dog walking on well-being* (Unpublished master's thesis). Carleton University, Canada. Retrieved from https://curve.carleton.ca/system/files/etd/e6b712f8-2a35-40dd-bbc4-5d4adef85251/etd_pdf/28ac6089b8fdf532d9cf368f619ad2ff/duvallantonacopoulos-theeffectsofdogwalkingonwellbeing.pdf
- Antonacopoulos, D., & Pychyl, T. A. (2010). Examining the role of pet ownership, human social support, pet attachment in psychological health of individuals living alone. *Anthrozoös*, 23, 37-54. Retrieved from <http://dx.doi.org/10.2752/175303710X12627079939143>
- Aylward, J., Valton, V., Goer, F., Mkrtchian, A., Lally, N., Peters, S., . . . Robinson, O. J. (2017). The impact of induced anxiety on affective response inhibition. *Royal Society Open Science*, 4, 1-11. doi:10.1098/rsos.170084
- Baird, B. M., Lucas, R. E., & Donnellan, M. B. (2010). Life satisfaction across the lifespan: Finding from two nationally representative panel studies. *Social Indicators Research*, 99(2), 183-203. doi:10.1007/s11205-010-9584
- Balatsky, G., & Diener, E. (1993). A comparison of the well-being of Soviet and American students. *Social Indicators Research*, 28, 225-243. Retrieved from <http://www.jstor.org/stable/27522672>
- Banks, M. R., Willoughby, L. M., & Banks, W. A. (2008). Animal-assisted therapy and loneliness in nursing homes: Use of robotic versus living dogs. *Journal of the American Medical Directors Association*, 9(3), 173-177. doi:10.1016/j.jamda.2007.11.007
- Bao, K. J., & Schreer, G. S. (2016). Pets and happiness: Examining the association between pet ownership and wellbeing. *Anthrozoös*, 29(2), 283-296. doi:10.1080/08927936.2016.1152721
- Barker, S. B., Barker, R. T., McCain, N. L., & Schubert, C. M. (2016). A randomized cross-over exploratory study of the effect of visiting therapy dogs on college student stress before final exams. *Anthrozoös*, 29(1), 35-46, doi:10.1080/08927936.2015.1069988

- Barker, S., Best, A. M., & Rasmussen, G. H. (2003). Effect of aquariums on electroconvulsive therapy patients. *Anthrozoös*, *16*(3), 229-240. doi:10.2752/089279303786992071
- Barker, S. B., Knisely, J. S., McCain, N. L., Schubert, C. M., & Pandurangi, A. K. (2010). Exploratory study of stress-buffering response patterns from interaction with a therapy dog. *Anthrozoös*, *23*(1), 79-91. <https://doi.org/10.2752/175303710X12627079939341>
- Bartels, M. (2015). Genetics of wellbeing and its components satisfaction with life, happiness, and quality of life: A review and meta-analysis of heritability studies. *Behavior Genetics Journal*, *45*, 137-156. doi:10.1007/s10519-015-9713-y
- Bartholomew, K. (1990). Avoidance of intimacy: An attachment perspective. *Journal of Social and Personal Relationships*, *7*, 147-178. doi:10.1177/0265407590072001
- Baumeister, R. F., Tice, D. M., & Hutton, D. G. (1989). Self-presentational motivations and personality differences in self-esteem. *Journal of Personality*, *57*, 547-57. doi:10.1111/j.1467-6494.1989.tb02384.x
- Beals, E. E. (2009). *Emotional benefits of dog ownership: Impact of the presence of a pet dog on owners responses to negative mood induction* (Unpublished master's thesis). New School for Social Research, New York, NY. Retrieved from http://www.livingwithdogs.gr/images/pdf/Emotional_Benefits_of_Dog_Ownership.pdf
- Beck, A. M. (2014). The biology of the human-animal bond. *Animal Frontiers*, *4*(3), 32-36. doi:10.2527/af.2014-0019
- Beetz, A., Uvnäs-Moberg, K., Julius, H., & Kotrschal, K. (2012). Psychosocial and psychophysiological effects of human-animal interactions: The possible role of oxytocin. *Frontiers in Psychology*, *3*(234), 1-15. doi:10.3389/fpsyg.2012.00234

- Be Lue, R., Schreiner, A. S., Taylor-Richardson, K., Murray-kolb, L. E., & Beard, J. L. (2008). What matters most: An investigation of predictors of perceived stress among young mothers in Khayelitsha. *Health Care for Women International, 29*, 638-648. doi:10.1080/07399330802089198
- Berens, P., Boonzaier, E., Malherbe, C., & Smith, A. (1996). *The Cape herders: A history of the Khoikhoi of southern Africa*. Cape Town, South Africa: David Philip Press.
- Berezowski, G. (2017). *SA's top Facebook brands, pages and media*. Retrieved from <http://themediainline.co.za/2017/01/sas-top-facebook-brands-pages-and-media/>
- Berget, B., Ekeberg, O., & Braastad, B. O. (2008). Animal-assisted therapy with farm animals for persons with psychiatric disorders: Effects on self-efficacy, coping ability and quality of life, a randomized controlled trial. *Clinical Practice and Epidemiology in Mental Health, 4*, 4-9. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2323374/pdf/1745-0179-4-9.pdf>
- Berget, B., Ekeberg, O., Pedersen, I., & Braastad, B. (2011). Animal-assisted therapy with farm animals for persons with psychiatric disorders: Effects on anxiety and depression. A randomized controlled trial. *Clinical Practice and Epidemiology in Mental Health, 27*, 50-64. doi:10.1080/0164212X.2011.543641
- Beukes, M., Walker, S., & Esterhuyse, K. (2010). The role of coping responses in the relationship between perceived stress and disordered eating in a cross-cultural sample of female university students. *Stress & Health, 26*(4), 280-291. doi:10.1002/smi.1296
- Bhat, S. B., & Basson, W. J. (2013). Perceived stress of dental students. *Journal of Psychology in Africa, 23*(4), 647-649. doi:10.1080/14330237.2013.10820682
- Bjick, M. (2013). *The effects of a therapy animal on college students stress and arousal* (Unpublished master's thesis). St. Catherine University, MN. Retrieved from http://sophia.stkate.edu/msw_papers/152

- Blachino, A., Przepiorka, A., & Pantic, I. (2016). Association between Facebook addiction, self-esteem and life satisfaction: A cross-sectional study. *Computers in Human Behavior, 55*, 701-705. <http://dx.doi.org/10.1016/j.chb.2015.10.026>
- Blanchflower, D. G., & Oswald, A. J. (2011). International happiness. *NBER Working Paper No. 16668*. Retrieved from <http://www.nber.org/papers/w16668.pdf>
- Bland, H. W., Melton, B. F., Bigham, L. E., & Welle, P. D. (2014). Quantifying the impact of physical activity on stress tolerance in college students. *College Student Journal, 48*(4), 559-568. Retrieved from http://works.bepress.com/bridget_melton/118/
- Bodson, L. (2000). Motivations for pet keeping in ancient Greece and Rome: A preliminary survey. In A. L. Podberscek, E. S. Paul, & J. A. Serpell (Eds.), *Companion animals and us: Exploring the relationships between people and pets* (pp. 27-41). Cambridge, UK: Cambridge University Press.
- Booyesen, F., & Botha, F. (2012). The gold of one's ring is not far more precious than the gold of one's heart: Reported life satisfaction among married and cohabitating South African adults. *Journal of Happiness Studies, 14*, 433-456. doi:10.1007/s10902-012-9337-3
- Borgi, M., & Cirulli, F. (2016). Pet face: Mechanisms underlying human-animal relationships. *Frontiers in Psychology, 7*, 298. doi:10.3389/fpsyg.2016.00298
- Bowlby, J. (1977). The making and breaking of affectionate bonds. I. Etiology and psychopathology in the light of attachment theory. *The British Journal of Psychiatry, 130*(3), 201-210. doi:10.1192/bjp.130.3.201
- Bowlby, J. (1982). *Attachment and loss: Attachment* (2nd ed.). New York, NY: Basic Books.
- Brown, R. J. (1995). *Prejudice: Its social psychology*. Oxford, UK: Blackwell.
- Brown, S. G., & Rhodes, R. E. (2006). Relationships among dog ownership and leisure-time walking in Western Canadian adults. *American Journal of Preventive Medicine, 30*(2), 131-136. doi:10.1016/j.amepre.2005.10.007

- Brown, S. L. (2000). The effect of union type on psychological well-being: depression among cohabitants versus marrieds. *Journal of Health and Social Behaviour*, 41(3), 241-55. Retrieved from <http://www.jstor.org/stable/2676319>
- Brown, S. L., Bulanda, J. R., & Lee, G. R. (2005). The significance of non-marital cohabitation: Marital status and mental health benefits among middle-aged and older adults. *The Journal of Gerontology Series B: Psychological Sciences and Social Sciences*, 60(1), 21-29. doi:<https://doi.org/10.1093/geronb/60.1.S21>
- Bryman, A. (2012). *Social research methods* (4th ed.). Oxford, UK: Oxford University Press.
- Buckle, C. J. (2015). *Effects of an animal visitation intervention on the depression, loneliness, and quality of life of older people: A randomised controlled study* (Unpublished master's thesis). Stellenbosch University, South Africa. Retrieved from <http://scholar.sun.ac.za/handle/10019.1/98082>
- Budiansky, S. (1992). *The covenant of the wild: Why animals chose domestication*. London, UK: Yale University Press.
- Burns, J. (2009). *Wellbeing & social cohesion: Analysis of the NIDS Wave 1 dataset*. Retrieved from <http://www.nids.uct.ac.za/publications/discussion-papers/wave-1-papers/98-nids-discussion-paper-no07/file>
- Busch, C., Tucha, L., Talarovicova, A., Fuermaier, A. B. M., Lewis-Evans, B., & Tucha, O. (2016). Animal-assisted interventions for children with attention deficit/ hyperactivity disorder: A theoretical review and consideration of future research directions. *Psychological Reports*, 118(1), 292-331. doi:10.1177/0033294115626633
- Byers, C. G., Wilson, C. C., Stephens, M. B., Goodie, J. L., Netting, F. E., & Olsen, C. H. (2014). Owners and pets exercising together: Canine response to veterinarian-prescribed physical activity. *Anthrozoös*, 27(3), 325-333. doi:10.2752/175303714X14036956449224

- Campbell, K., Smith, C. M., Tumilty, S., Cameron, C., & Treharne, G. (2016). How does dog-walking influence perceptions of health and wellbeing in healthy adults? A qualitative dog-walk-along study. *Anthrozoös*, 29(2), 181-192. Retrieved from <https://doi.org/10.1080/08927936.2015.1082770>
- Cardoso, C., Ellenbogen, M. A., Serravalle, L., & Linnen, A. M. (2013). Stress-induced negative mood moderates the relation between oxytocin administration and trust: Evidence for the tend-and-befriend response to stress? *Psychoneuroendocrinology*, 38(11), 2800-2804. doi:10.1016/j.psyneuen.2013.05.006
- Carlson, N. R. (2013). *Physiology of behavior* (11th ed). Boston, MA: Pearson.
- Carver, C. S., & Connor-Smith, J. (2010). Personality and coping. *Annual Review of Psychology*, 61, 679-704. doi:10.1146/annurev.psych.093008.10035
- Castro, A. L., & Schlebusch, L. (2006). The measure of stress in breast cancer patients. *South African Journal of Psychology*, 36(4), 762-779. doi:10.1177/008124630603600407
- Cavanaugh, L. A., Leonard, H. A., & Scammon, D. L. (2008). A tail of two personalities: How canine companions shape relationships and well-being. *Journal of Business Research*, 61, 469-479. doi:10.1016/j.jbusres.2007.07.024
- Chapman, C., & Feit, E. C. (2015). *R for marketing research and analytics*. New York, NY: Springer.
- Chen, P., Hoffman, C. L., Jacobson, K. C., & Serpell, J. A. (2013). Do dog behavioural characteristics predict the quality of the relationship between dogs and their owners. *Human-animal Interaction Bulletin*, 1(1), 20-37. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4326091/>
- Chesney, T., & Lawson, S. (2007). The illusion of love. Does a virtual pet provide the same companionship as a real one? *Interaction Studies*, 8(2), 337-342. doi:10.1075/is.8.2.09che

- Chianga, Y. M., & Changa, Y. (2012). Stress, depression, and intention to leave among nurses in medical units: Implications for healthcare management/nursing practice. *Health Policy, 108*(2-3), 149-157. doi:10.1016/j.healthpol.2012.08.027
- Chur-Hansen, A., Peacock, J., & Winefield, H. (2012). Mental health implications of human attachment to companion animals. *Journal of Clinical Psychology, 68*(3), 292-303. doi:10.1002/jclp.20866
- Chur-Hansen, A., Stern, C., & Winefield, H. (2010). Gaps in the evidence about companion animals and human health: Some suggestions for progress. *International Journal of Evidence-Based Healthcare, 8*, 140-146. doi:10.1111/j.1744-1609.2010.00176.x
- Chur-Hansen, A., Winefield, H., & Beckwith, M. (2009). Companion animals for elderly women: The importance of attachment. *Qualitative Research in Psychology, 6*(4), 281-293. doi:10.1080/14780880802314288
- Cline, K. M. C. (2010). Psychological effects of dog ownership: Role strain, role enhancement, and depression. *The Journal of Social Psychology, 150*, 117-131. Retrieved from <http://www.csus.edu/faculty/m/fred.molitor/docs/dog%20ownership%20and%20depression.pdf>
- Coakley, A. B., & Mahoney, E. K. (2009). Creating a therapeutic and healing environment with a pet therapy program. *Complementary Therapies in Clinical Practice, 15*(3), 141-146. Retrieved from <http://dx.doi.org/10.1016/j.ctcp.2009.05.004>
- Coetzee, N., Beukes, J. T., & Lynch, I. (2013). Substance abuse inpatients' experience of animal-assisted therapy. *Journal of Psychology in Africa, 23*(3), 477-480. doi:10.1080/14330237.2013.10820654
- Cohen, S. P. (2002). Can pets function as family members? *Western Journal of Nursing Research, 24*(6), 621-638. doi:10.1177/019394502320555386

- Cohen, S., Gottlieb, B. H., & Underwood, L. G. (2000). Social relationships and health. In S. Cohen, L. G. Underwood, & B. H. Gottlieb (Eds.), *Social support measurement and intervention: A guide for health and social scientists* (pp. 1-25). New York, NY: Oxford University Press.
- Cohen, S., & Janicki-Deverts, D. (2012). Who's Stressed? Distributions of psychological stress in the United States in probability samples from 1983, 2006, and 2009. *Journal of Applied Social Psychology, 42*(6), 1320-1334. doi:10.1111/j.1559-1816.2012.00900.x
- Cohen, S., Janicki-Deverts, D., & Miller, G. E. (2007). Psychological stress and disease. *Journal of the American Medical Association, 298* (14), 1685-1687. doi:10.1001/jama.298.14.1685
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24*, 386-396. Retrieved from <http://www.psy.cmu.edu/~scohen/globalmeas83.pdf>
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*(2), 310-357. doi:10.1037/0033-2909.98.2.310
- Cole, K. M., Gawlinski, A., Steers, N., & Kotlerman, J. (2007). Animal-assisted therapy in patients hospitalized with heart failure. *American Journal of Critical Care 16*, 575-585. Retrieved from <http://ajcc.aacnjournals.org/content/16/6/575.long>
- Colombo, G., Buono, M. D., Smania, K., Raviola, R., & De Leo, D. (2006). Pet therapy and institutionalized elderly: A study on 144 cognitively unimpaired subjects. *Archives of Gerontology and Geriatrics, 42*, 207-216. doi:10.1016/j.archger.2005.06.011
- Council for Science and Society. (1988). *Companion animals in society: Report of a working party council for science and society*. Oxford, UK: Oxford University Press.
- Cozby, P. C., & Bates, S. C. (2012). *Methods in behavioural research* (11th ed.). New York, NY: McGraw-Hill.

- Crandall, J. K., Steward, K., & Warf, T. M. (2016). A mobile app for reducing perceived stress in college students. *American Journal of Health Studies*, 31(2), 68-73. Retrieved from <http://works.bepress.com/kjasoncrandall/9/>
- Cutt, H. E., Giles-Corti, B., Wood, L. J., Knuiiman, M.. W., & Burke, V. (2008). Barriers and motivators for owners walking their dog: Results from qualitative research. *Health Promotion Journal of Australia*, 19(2), 118-24. Retrieved from <http://search.informit.com.au/documentSummary;dn=040086188980543;res=IELAPA>ISSN:1036-1073>
- Debue, K., Gerard, P., Guilaine, J., Hayle, L., & Vigne, J. D. (2004). Early taming of the cat in Cyprus. *Science*, 304(5668), 259. doi:10.1126/science.1095335
- De Kock, F., Kanjee, A., & Foxcroft, C. (2013). Cross-cultural test adaption, translation and tests in multiple languages. In C. Foxcroft, & G. Roodt (Eds.), *Psychological assessment in the South African context* (pp. 83-106). Cape Town, South Africa: Oxford University Press.
- Department of Health Pretoria, South Africa. (2003). *The South African demographic and health survey (SADHS)*. Pretoria, South Africa: Department of Health Pretoria. Retrieved from <https://dhsprogram.com/pubs/pdf/FR206/FR206.pdf>
- Department of Labour South Africa. (2012). *Commission for employment equity annual report 2011/2012*. Pretoria, South Africa: Government Printers. Retrieved from <http://www.labour.gov.za/DOL/downloads/documents/annual-reports/employment-equity/2011-2012/12th%20CEE%20Report.2012.pdf>
- Diehl, M., & Hay, E. L. (2010). Risk and resilience factors in coping with daily stress in adulthood: The role of age, self-concept incoherence, and personal control. *Developmental Psychology*. 46(5), 1132-1146. doi:10.1037/a0019937

- Diener, E., & Chan, M. Y. (2011). Happy people live longer: Subjective well-being contributes to health and longevity. *Applied Psychology: Health and Well-Being*, 3(1), 1-43. Retrieved from http://internal.psychology.illinois.edu/~ediener/Documents/Diener-Chan_2011.pdf
- Diener, E., & Diener, R. B. (2008). *Happiness: Unlocking the mysteries of psychological wealth*. Malden, MA: Blackwell.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49, 71-75. doi:10.1207/s15327752jpa4901_13
- Diener, E., Lucas, R. E., & Oishi, S. (2003). Personality, culture, and subjective well-being: Emotional and cognitive evaluations of life. *Annual Review of Psychology*, 54, 403-425. Retrieved from <https://doi.org/10.1146/annurev.psych.54.101601.145056>
- Diener, E., Sandvik, E., Seidlitz, L., & Diener, M. (1993). The relationship between income and subjective well-being: Relative or absolute. *Social Indicators Research*, 28, 19--223. Retrieved from https://www.researchgate.net/profile/Marissa_Diener/publication/227012666_The_relationship_between_income_and_subjective_well-being_Relative_or_Absolute/links/004635209587e9bd0d000000/The-relationship-between-income-and-subjective-well-being-Relative-or-Absolute.pdf
- Dlugonski, D., & Motl, R. W. (2012). Possible antecedents and consequences of self-esteem in persons with multiple sclerosis: Preliminary evidence from a cross-sectional analysis. *Rehabilitation Psychology*, 57(1), 35-42. doi:10.1037/a0027176
- Dodd, N. M. (2016). Household hunger, standard of living and satisfaction with life in Alice, South Africa. *Journal of Psychology in Africa*, 26(3), 284-287. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/14330237.2016.1185918>

- Dolan, P., Peasgood, T., & White, M. (2008). Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being. *Journal of Economic Psychology*, 29(1), 94-122. Retrieved from <https://doi.org/10.1016/j.joep.2007.09.001>
- Ebrahim, A., Botha, F., & Snowball, J. D. (2013). Determinants of life satisfaction among race groups in South Africa. *Development Southern Africa*, 30(2), 168-185. <http://dx.doi.org/10.1080/0376835X.2013.797227>
- Edwards, S. (2006). Physical exercise and psychological well-being. *South African Journal of Psychology*, 36(2), 357-373.
doi:10.1177/008124630603600209
- El-Alayli, A., Lystad, A. L., Webb, S. R., Hollingsworth, S. L., & Ciolli, J. L. (2006). Reigning cats and dogs: A pet-enhancement bias and its link to pet attachment, pet self-similarity, self-enhancement, and well-being. *Basic and Applied Social Psychology*, 28, 131-143.
doi:10.1207/s15324834basp2802_3
- Engelman, S. R. (2013). Palliative care and use of animal-assisted therapy. *OMEGA – Journal of Death and Dying*, 67(1-2), 63-67. Retrieved from http://journals.sagepub.com/doi/abs/10.2190/OM.67.1-2.g?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed
- Enmarker, I., Hellzen, O., Ekker, K., & Berg, A. (2012). Health in older cat and dog owners: The Nord-Trøndelag Health Study (HUNT)-3 study. *Scandinavian Journal of Public Health*, 40, 718-724. doi:10.1177/1403494812465031
- Esposito, L., McCune, S., Griffin, J. A., & Maholmes, V. (2011). Directions in human-animal interaction research: Child development, health, and therapeutic interventions. *Child Development Perspectives*, 5(3), 205-211. doi:10.1111/j.17508606.2011.00175.x
- Eun-Hyun Lee, R. N. (2012). Review of the psychometric evidence of the Perceived Stress Scale. *Asian Nursing Research*, 6(4), 121-127. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1976131712000527>

- Feng, Z., Dibben, C., Witham, M. D., Donnan, P. T., Vadiveloo, T., Sniehotta, F., . . . McMurdo, M. E. (2014). Dog ownership and physical activity in later life: A cross-sectional observational study. *Preventative Medicine, 66*, 101-106. doi:10.1016/j.ypmed.2014.06.004
- Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). London, UK: Sage.
- Field, N.P., Orsini, L., Gavish, R., & Packman, W. (2009). Role of attachment in response to pet loss. *Death Studies, 33*, 334-355. doi:10.1080/07481180802705783.
- Fine, A. H., & Beck, A. (2010). Understanding our kinship with animals: Input for health care professionals interested in the human/animal bond. In A. H. Fine (Ed.), *Handbook on animal-assisted therapy: Theoretical foundations and guidelines for practice* (3rd ed., pp. 3-15). London, UK: Elsevier Inc.
- Fowler, J. H., & Christakis, N. A. (2008). Dynamic spread of happiness in a large social network: Longitudinal analysis over 20 years in the Framingham Heart Study. *British Medical Journal, 337*, a2338. doi:10.1136/bmj.a2338
- Fraley, C. (2010). *A brief overview of adult attachment theory and research*. Retrieved from <https://internal.psychology.illinois.edu/~rcfraley/attachment.htm>
- Frey, B. S. (2008). *Happiness: A revolution in economics*. Cambridge, UK: MIT Press.
- 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*, 307-312. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1422527/pdf/pubhealthrpt001280003.pdf>

- Friedmann, E., Thomas, S. A., Son, H., Chapa, D., & McCune, S. (2013). Pet's presence and owner's blood pressures during the daily lives of pet owners with pre- to mild hypertension. *Anthrozoös*, 26(4), 535-550. Retrieved from <http://www.tandfonline.com/doi/abs/10.2752/175303713X13795775536138>
- Futuyama, D. (2006). *Evolutionary biology*. New York, NY: W.H. Freeman.
- Gallin, J. I., & Ognibene, F. P. (2007). *Principles and practice of clinical research*. Amsterdam, Netherlands: Elsevier Academic Press.
- Garbee, W. H., Zucker, S. B., & Selby, G. R. (1980). Perceived sources of stress among dental students. *The Journal of the American Dental Association*, 100(6), 853-857. Retrieved from [http://jada.ada.org/article/S0002-8177\(80\)06014-X/pdf](http://jada.ada.org/article/S0002-8177(80)06014-X/pdf)
- Gauthier, K. J., Christopher, A. N., Walter, M. I., Mourad, R., & Marek, P. (2006). Religiosity, religious doubt, and the need for cognition: Their interactive relationship with life satisfaction. *Journal of Happiness Studies*, 7(2), 139-154. doi:10.1007/s10902-005-1916-0
- Gerber, M. (2016). *Quality of life of tertiary students and their attachment to a companion animal* (Unpublished master's thesis). Stellenbosch University, South Africa. Retrieved from <http://scholar.sun.ac.za/handle/10019.1/98382>
- Gilmour, H. (2007). Physically active Canadians. *Health Reports*, 18, 45-65. Retrieved from <http://www.statcan.gc.ca/pub/82-003-x/2006008/article/phys/10307-eng.htm>
- Gove, W. R., Style, C. B., & Hughes, M. (1990). The effect of marriage on the well-being of adults: A theoretical analysis. *Journal of Family Issues*, 11(1), 34-35. Retrieved from <https://doi.org/10.1177/019251390011001002>
- Grier, K. (2006). *Pets in America: A history*. Chapel Hill, NC: University of North Carolina Press.

- Griffin, R. (2010). *10 health problems related to stress that you can fix*. Retrieved from <http://www.webmd.com/balance/stress-management/features/10-fixable-stress-related-health-problems#1>
- Guéguen, N., & Ciccotti, S. (2008). Domestic dogs as facilitators in social interaction: An evaluation of helping and courtship behaviors. *Anthrozoos*, *21*, 339-349. doi:10.1371/journal.pone.0046362
- Ham, H., & Epping, J. (2006). Dog walking and physical activity in the United States. *Preventing Chronic Disease*, *3*(2), 1-7. Retrieved from http://www.cdc.gov/pcd/issues/2006/apr/05_0106.htm
- Hamad, R., Fernald, L. C. H., Karlan, D. S., & Zinman, J. (2008). Social and economic correlates of depressive symptoms and perceived stress in South African adults. *Journal of Epidemiology and Community Health*, *62*(6), 538-544. Retrieved from <http://www.jstor.org/stable/40665595>
- Handlin, L., Hydbring-Sandberg, E., Nilsson, A., Ejdebäck, M., Jansson, A., & UvnäsMoberg, K. (2011). Short-term interaction between dogs and their owners: Effects on oxytocin, cortisol, insulin and heart rate - an exploratory study. *Anthrozoös*, *24*, 301-316. doi:10.2752/175303711X13045914865385
- Headey, B., & Grabka, M. M. (2007). Pets and human health in Germany and Australia: National longitudinal results. *Social Indicators Research*, *80*(2), 297-311. Retrieved from <https://link.springer.com/article/10.1007/s11205-005-5072-z>
- Herman, D. (2000). *The counter side of affirmative action*. Pretoria, South Africa: Jotha.
- Herzog, H. A. (2007). Gender differences in human-animal Interactions: A review. *Anthrozoös*, *20*(1), 17-21. Retrieved from <http://www.tandfonline.com/doi/abs/10.2752/089279307780216687>
- Hill, R. P., Gaines, J., & Wilson, R. M. (2008). Consumer behavior, extended-self, and sacred consumption: An alternative perspective from our animal companions. *Journal of Business Research*, *61*, 553-562. doi:10.1016/j.jbusres.2006.11.009

- Himsworth, C. G., & Rock, M. (2013). Pet ownership, other domestic relationships, and satisfaction with life among seniors: Results from a Canadian national survey. *Anthrozoos, 26*(2), 295-305.
doi:10.2752/175303713X13636846944448
- Hirschman, E. C. (1994). Consumers and their animal companions. *Journal of Consumer Research, 20*, 616-632. doi:10.1086/209374
- Hoffmann, A. O. M., Lee, A. H., Wertenaue, F., Ricken, R., Jansen, J. J., Gallinat, J., . . . Lang, U, E. (2009). Dog-assisted intervention significantly reduces anxiety in hospitalized patients with major depression. *European Journal of Integrative Medicine, 1*(3), 145-148. Retrieved from <https://doi.org/10.1016/j.eujim.2009.08.002>
- Horowitz, S. (2008). The human-animal bond: Health implications across the lifespan. *Alternative and Complementary Therapies, 14*, 251-256.
doi:10.1089/act.2008.14505
- Hosey, G., & Melfi, M. (2014). Human-animal interactions, relationships and bond: A review and analysis of the literature. *International Journal of Comparative Psychology, 27*(1), 117-142. Retrieved from <http://escholarship.org/uc/item/6955n8kd>
- House, J. S., & Kahn, R. L. (1985). Measures and concepts of social support. In S. Cohen, & S. L. Syme (Eds.), *Social support and health* (pp. 83-108). New York, NY: Academic Press.
- Hunt, M., & Padilla, Y. (2006). Development of the pet bereavement questionnaire. *Anthrozoos, 19*, 308-324. doi:10.2752/089279306785415493
- Hutchinson, G., Simson, D. T., Bain, B. C., Wyatte, G. E., Tucker, M. B., & Lefranc, E. (2004). Social and health determinants of well-being and life satisfaction in Jamaica. *The International Journal of Social Psychiatry, 50*, 43-53. doi:10.1177/0020764004040952
- Internet World Stats (2016). *Africa internet users: Facebook and 2016 population statistics*. Retrieved from <http://www.internetworldstats.com/stats1.htm>

- Jackson, L. T. B., Van de Vijver, F. J. R., & Fouché, R. (2014). Psychological strengths and subjective well-being in South African white students, *Journal of Psychology in Africa*, 24(4), 299-307. Retrieved from <http://dx.doi.org/10.1080/14330237.2014.980617>
- Johnson, R. A., & Meadows, R. L. (2010). Dog-walking: Motivation for adherence to a walking program. *Clinical Nursing Research*, 19(4), 387-402. doi:10.1177/1054773810373122
- Johnson, T. P., Garrity, T. F., & Stallones, L. (1992). Psychometric evaluation of the Lexington Attachment to Pets Scale (LAPS) *Anthrozoös*, 5(3), 160-175. doi:10.2752/089279392787011395
- Jonker, C. S., Koekemoer, E., & Nel, J. A. (2015). Exploring a positive SWB model in a sample of university students in South Africa. *Social Indicators Research*, 121, 815-832. doi:10.1007/s11205-014-0658-y
- Joshanloo, M., & Afshari, S. (2011). Big five personality traits and self-esteem as predictors of life satisfaction in Iranian Muslim university students. *Journal of Happiness Studies*, 12, 105-113. doi:10.1007/s10902-009-9177-y
- Kaplan, R. M., Chambers, D. A., & Glasgow, R. E. (2014). Big data and large sample size: A cautionary note on the potential for bias. *Clinical Translation Science*, 7(4), 342-346. doi:10.1111/cts.12178
- Kaufman, A. S., & Kaufman, N. L. (2014). *Essentials of psychological testing*. Hoboken, NJ: John Wiley & Sons, Inc.
- Kaufman, K. R., & Kaufman, N. D. (2006). And then the dog died. *Death Studies*, 30, 61-76. doi:10.1080/07481180500348811
- Kayitesi, M. L., & Mwaba, K. (2014). South Africa university students' life satisfaction and perceptions of African immigrants. *Social Behaviour and Personality*, 42(7), 1127-1132. Retrieved from <http://dx.doi.org/10.2224/sbp.2014.42.7.1127>
- Kellert, S. R. (1993). Introduction. In S. R. Kellert, & E. O. Wilson (Eds.), *The biophilia hypothesis* (pp. 20-27). Washington, DC: Island Press.

- Keyes, C. L. M., Wissing, M., Potgieter, J. P., Temane, M., Kruger, A., & Rooy, S. (2008). Evaluation of the Mental Health Continuum–Short Form (MHC– SF) in Setswana speaking South Africans. *Clinical Psychology and Psychotherapy*, *15*, 181-192. doi:10.1002/cpp.572
- Kikusui, T., Winslow, J. T., & Mori, Y. (2006). Social buffering: Relief from stress and anxiety. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *361*, 2215-2228. doi:0.1098/rstb.2006.1941
- Kim, K. H., Bursac, Z., DiLillo, V., White, D. B., & West, D. S. (2009). Stress, race, and body weight. *Healthy psychology*, *28*(1), 131-135. doi:10.1037/a0012648
- Knight, S., & Edwards, V. (2008). In the company of wolves: The physical, social, and psychological benefits of dog ownership. *Journal of Aging and Health*, *20*(4), 437-455. Retrieved from <http://journals.sagepub.com/doi/abs/10.1177/0898264308315875>
- Koontz, J. L. (2009). *Stress, social support, health and human-animal bond in single mother* (Unpublished doctoral dissertation). Northcentral University, Arizona state. Abstract retrieved from <http://gradworks.umi.com/33/84/3384703.html>
- Kramer, S. C., Friedmann, E., & Bernstein, P. L. (2009). Comparison of the effect of human interaction, animal-assisted therapy, and AIBO- assisted therapy on long-term care residents with dementia. *Anthrozoös*, *22*, 43-57. doi:10.2752/175303708X390464
- Krause-Parello, C. A. (2012). Pet ownership and older women: The relationships among loneliness, pet attachment support, human social support and depressed mood. *Geriatric Nursing*, *33*(3), 194-203. doi:10.1016/j.gerinurse.2011.12.005
- Kruger, K. A., & Serpell, J. A. (2010). Animal-assisted interventions in mental health: Definitions and theoretical foundations. In A. H. Fine (Ed.), *Handbook on animal-assisted therapy* (3rd ed., pp. 33-48). London, UK: Elsevier.

- Kruger, S., & Sonono, E. (2016). Physical activity and psychosomatic-related health problems as correlates of quality of life among university students. *Journal of Psychology in Africa, 26*, 357-362. Retrieved from <http://www.tandfonline.com/doi/citedby/10.1080/14330237.2016.1185907?scroll=top&needAccess=true>
- Kübler-Ross, E., & Kessler, D. (2005). *On grief and grieving: Finding the meaning of grief through the five stages of loss*. NY, New York: Scribner.
- Kurdek, L. A. (2009). Pet dogs as attachment figures for adult owners. *Journal of Family Psychology, 23*, 439-446. doi:10.1037/a0014979.
- Kushner, R., Blatner, D., Jewell, D., & Rudloff, K. (2006). The PPET study: People and pets exercising together. *Obesity, 14*(10), 1762-1770. doi:10.1038/oby.2006.203
- Laerd Statistics. (n.d.). *One-way ANOVA (cont...)*. Retrieved from <https://statistics.laerd.com/statistical-guides/one-way-anova-statistical-guide-2.php>
- LaJoie, K. R. (2003). *An evaluation of the effectiveness of using animals in therapy* (Unpublished doctoral dissertation). Spalding University, Kentucky. Retrieved from <http://search.proquest.com/docview/305224729?accountid=14049>
- Lakey, B., & Cohen, S. (2000). Social support theory and measurement. In S. Cohen, L. G. Underwood, & B. H. Gottlieb (Eds.), *Social support measurement and intervention: A guide for health and social scientists* (pp. 29-52). New York, NY: Oxford University Press.
- Lang, U. E., Jansen, J. B., Wertenauer, F., Gallinat, J., & Rapp, M. A. (2010). Reduced anxiety during dog assisted interviews in acute schizophrenic patients. *European Journal of Integrative Medicine, 2*, 123-127. <https://doi.org/10.1016/j.eujim.2010.07.002>
- Langston, W. (2011). *Research methods: Laboratory manual for psychology*. Belmont, CA: Wadsworth Cengage Learning.

- 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*, 1-7
<https://doi.org/10.3389/fpsyg.2014.01010>
- Lazarus, R. (1993). From psychological stress to the emotions: A history of changing outlooks. *Annual Review of Psychology, 44*, 1-21. Retrieved from
<http://www.annualreviews.org/doi/abs/10.1146/annurev.ps.44.020193.000245>
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY: Springer.
- Lear, J. (2012). Our furry friends: The history of animal domestication. *Journal of Young Investigators, 23*(2), 1-3. Retrieved from http://www.jyi.org/wp-content/uploads//articleimages/3769/JYI%20Volume%2023%20Issue%20%20NF%20-%20Lear,%20Jessica_Our%20Furry%20Friends,%20the%20History%20of%20Animal%20Domestication.pdf
- Lebois, L. A. M., Hertzog, C., Slavich, G. M., Barrett, L. F., & Barsalou, L. W. (2016). Establishing the situated features associated with perceived stress. *Acta Psychologica, 169*, 119-132. doi:10.1016/j.actpsy.2016.05.012
- 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. doi:10.11648/j.ajap.s.2015040301.18
- Lee, H., Shepley, M., & Huang, C. (2009). Evaluation of off-leash dog parks in Texas and Florida: A study of use patterns, user satisfaction, and perception. *Landscape and Urban Planning, 92*, 314-324.
<https://doi.org/10.1016/j.landurbplan.2009.05.015>
- Le Roux, M. C., & Kagee, A. (2008). Subjective wellbeing of primary healthcare patients in the Western Cape, South Africa. *South African Family Practice, 50*(3), 68-68. doi:10.1080/20786204.2008.10873723

- Le Roux, M. C., & Kemp, R. (2009). Effect of a companion dog on depression and anxiety levels of elderly residents in a long-term care facility. *Psychogeriatrics*, 9(1), 23-26. doi: 10.1111/j.1479-8301.2009.00268.x
- Le Roux, M. C., Swart, L., & Swart, E. (2014). The effect of an animal-assisted reading program on the reading rate, accuracy and comprehension of grade 3 students: A randomized controlled study. *Child Youth Care Forum*, 43, 655-673. doi:10.1007/s10566-014-9262-1
- Levin, I., & Trost, J. (1992). Understanding the concept of family. *Family Relations*, 41, 348-351. doi:10.2307/585202
- Lewis, A., Krägeloh, C. U., & Shepherd, D. (2009). Pet ownership, attachment and health-rated quality of life in New Zealand. *Electronic Journal of Applied Psychology: General Articles*, 5(1), 96-101. Retrieved from <http://ojs.lib.swin.edu.au/index.php/ejap/article/viewFile/138/184>
- Li, B., Ma, H., Guo, Y., Xu, F., Yu, F., & Zhou, Z. (2014). Positive psychological capital: A new approach to social support and subjective well-being. *Social Behavior and Personality*, 42(1), 135-144. <http://dx.doi.org/10.2224/sbp.2014.42.1.135>
- Lubbe, C., & Scholtz, S. (2013). The application of animal-assisted therapy in the South African context: A case study. *South African Journal of Psychology*, 43(1), 116-129. doi:10.1177/0081246312474405
- Lue, T. W., Pantenburg, D. P., & Crawford, P. M. (2008). Impact of the owner-pet and client-veterinarian bond on the care that pets receive. *Journal of the American Veterinary Medical Association*, 232(4), 531-540. doi:10.2460/javma.232.4.531.
- Luhmann, M., & Kalitzki, A. (2016). How animals contribute to subjective well-being: A comprehensive model of protective and risk factors. *The Journal of Positive Psychology*, 13(2), 200-214. doi:10.1080/17439760.2016.1257054
- Lunenburg, F. C., & Irby, B. J. (2008). Writing a successful thesis or dissertation: Tips and strategies for students in the social and behavioral sciences. Thousand Oaks, CA: Corwin Press.

- Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success. *Psychological Bulletin*, *131*(6), 803-855. doi:10.1037/0033-2909.131.6.803
- Magalhaes Das Neves, M. K., Loots, J. M., & Van Niekerk, R. L. (2014). The effect of various physical exercise modes on perceived psychological stress. *South African Journal of Sports Medicine*, *26*(4), 104-108. doi:10.7196/SAJSM.476
- Maharaj, Y. (2017). *Is the humanisation trend wagging the SA pet care market?* Retrieved from <http://www.insightsurvey.co.za/blog/humanisation-trend-wagging-sa-pet-care-market>
- Maher, J. P., Doerksen, S. E., Elavsky, S., & Conroy, D. E. (2014). Daily satisfaction with life is regulated by both physical activity and sedentary behavior. *Journal of Sport & Exercise Psychology*, *36*(2), 166-178. <http://dx.doi.org/10.1123/jsep.2013-0185>.
- Marcus, D. A. (2013). The science behind animal-assisted therapy. *Current Pain and Headache Reports*, *17*(4), 1-7. doi:10.1007/s11916-013-0322-2
- Marinelli, L., Adamelli, S., Normando, S., & Bono, G. (2007). Quality of life of the pet dog: Influence of owner and dog's characteristics. *Applied Animal Behaviour Science*, *108*, 143-156. doi: 0.1016/j.applanim.2006.11.018
- 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), 1239-1252. doi:10.1037/a0024506
- McCune, S., Kruger, K. A., Griffin, J. A., Esposito, L., Freund, L. S., Hurley, K. J., . . . Bures, R. (2014). Evolution of research into the mutual benefits of human-animal interaction. *Animal Frontiers*, *4*(3), 49-58. doi:10.2527/af.2014-0022
- McLead, S. (2010). *What is the stress response?* Retrieved from <https://www.simplypsychology.org/stress-biology.html>
- Mentz, M. (2012). Survey research. In C. Wagner, B. Kawulich, & M. Garner (Eds.), *Doing social research: A global context* (pp. 100-113). New York, NY: McGraw-Hill.

- Mertens, D. M. (2005). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods* (2nd ed.). Thousand Oaks, CA: Sage Publications, Inc.
- Mháistir, G. (2013). *Influence of pet ownership on self-esteem, life satisfaction and loneliness among over 65s in Ireland* (Unpublished master's thesis). DBS School of Arts, Dublin. Retrieved from http://esource.dbs.ie/bitstream/handle/10788/1607/hdip_mhaistir_g_2013.pdf?sequence=1
- Mikulincer, M., & Shaver, P. R. (2007). Boosting attachment security to promote mental health, prosocial values, and inter-group tolerance. *Psychological Inquiry*, 18, 139-156. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/10478400701512646>
- Mikulincer, M., Shaver, P. R., & Zilcha-Mano, S. (2011). An attachment perspective on human–pet relationships: Conceptualization and assessment of pet attachment orientations. *Journal of Research in Personality*, 45(4), 345-357. Retrieved from <http://dx.doi.org/10.1016/j.jrp.2011.04.001>
- Miller, S. C., Kennedy, C., DeVoe, D., Hickey, M., Nelson, T., & Kogan, L. (2009). An examination of changes in oxytocin levels in men and women before and after interaction with a bonded dog. *Anthrozoös*, 22, 31-42. Retrieved from <http://www.tandfonline.com/doi/abs/10.2752/175303708X390455?journalCode=rfa20>
- Moller, V. (2007). Satisfied and dissatisfied South Africans: Results from the General Household Survey in international comparison. *Social Indicators Research*, 81(2), 389-415. Retrieved from <https://link.springer.com/article/10.1007/s11205-006-9004-3>
- Morey, D. F. (2006). Burying key evidence: The social bond between dogs and people. *Journal of Archaeological Science*, 33(2), 158-175. Retrieved from <http://dx.doi.org/10.1016/j.jas.2005.07.009>

- Mueller, M. K. (2014). Is human-animal interactions (HAI) linked to positive youth development? Initial answers. *Applied Developmental Science, 18*(1), 5-16. doi:10.1080/10888691.2014.864205
- Muirhead, V., & Locker, D. (2007). Canadian dental students' perceptions of stress. *European Journal of Dental Education, 12*(3), 144-148. doi:10.1111/j.1600-0579.2008.00512.x.
- Nagasawa, M., Kikusui, T., Onaka, T., & Ohta, M. (2008). Dog's gaze at its owner increases owner's urinary oxytocin during social interaction. *Hormones and Behaviour, 55*, 434-441. doi:10.1016/j.yhbeh.2008.12.002
- Nations, D. (2017). *What Is Facebook?* Retrieved from <https://www.lifewire.com/what-is-facebook-3486391>
- Nebbe, L. (2001). The elementary school counsellor and the HCAB. In P. Salloto (Ed.), *Pet assisted therapy: A loving intervention and an emerging profession: Leading to a friendlier, healthier, and more peaceful world* (pp. 122-130). Norton, MA: D.J. Publications.
- Nell, W., De Crom, E., Coetzee, H., & Van Eeden, E. (2015). The psychosocial well-being of a "forgotten" South African community: The case of Ndumo, KwaZulu-Natal. *Journal of Psychology in Africa, 25*(3), 171-181. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/14330237.2015.1065050?journalCode=rpia20>
- Nepps, P., Stewart, C. N., & Bruckno, S. R. (2014). Animal-assisted activity: Effects of a complementary intervention program on psychological and physiological variables. *Journal of Evidence-Based Complementary & Alternative Medicine, 19*(3), 211-215. doi:10.1177/2156587214533570
- Neto, F., & Barros, J. (2007). Satisfaction with life among adolescents from Portuguese immigrant families in Switzerland. *Swiss Journal of Psychology, 66*, 215-223. Retrieved from <http://psycnet.apa.org/buy/2007-18208-003>

- Netting, F. E., Wilson, C. C., Goodie, J. L., Stephens, M. B., Byers, C. G., & Olsen, C. H. (2013). Attachment, social support, and perceived mental health of adult dog walkers: What does age have to do with it? *Journal of Sociology and Social Welfare*, 40(4), 261-283. Retrieved from http://www.wmich.edu/hhs/newsletters_journals/jssw_institutional/institutional_subscribers/40.4.Netting.pdf
- Neuman, W. L. (2014). *Social research methods: Qualitative and quantitative approaches* (7th ed). Essex, UK: Pearson.
- Noonan, E. (2008). People and pets. *Psychodynamic Counselling*, 4(1), 17-31. Retrieved from <http://dx.doi.org/10.1080/14753630802492722>
- Nordin, M., & Nordin, S. (2013). Psychometric evaluation and normative data of the Swedish version of the 10-item Perceived Stress Scale. *Scandinavian Journal of Psychology*, 54(6), 502-507. doi:10.1111/sjop.12071
- Odendaal, S. J. S. (2000). Animal-assisted therapy - magic or medicine? *Journal of Psychosomatic Research*, 49, 275-280. Retrieved from <https://pdfs.semanticscholar.org/c5a0/86724b47911fa83df78f8fe563eaf37c60a2.pdf>
- Odendaal, S. J. S., & Meintjies, R. A. (2003). Neurophysiological correlates of affiliative behaviour between humans and dogs. *The Veterinary Journal*, 165(3), 296-301. doi:10.1016/S1090-0233(02)00237-X
- Panayiotou, G., & Karekla, M. (2013). Perceived social support helps, but does not buffer the negative impact of anxiety disorders on quality of life and perceived stress. *Social Psychiatry and Psychiatric Epidemiology*, 8, 283-294. doi:10.1007/s00127-012-0533-6
- Passer, M. W. (2014). *Research methods: Concepts and connections*. New York, NY: Worth Publishers.

- Patel, C. J., Ramgoon, S., & Paruk, Z. (2009). Exploring religion, race and gender as factors in the life satisfaction and religiosity of young South African adults. *South African Journal of Psychology*, 39(3), 266-274. Retrieved from <http://journals.sagepub.com.ez.sun.ac.za/doi/pdf/10.1177/008124630903900302>
- Pavot, W., Diener, E., & Suh, E. (1998). The Temporal Satisfaction With Life Scale. *Journal of Personality Assessment*, 70(2), 340-354. doi:10.1207/s15327752jpa7002_11
- Pedersen, I., Martinsen, E. W., Berget, B., & Braastad, B. O. (2012). Farm animal-assisted intervention for people with clinical depression: A randomized controlled trial. *Anthrozoös*, 25(2), 149-160. Retrieved from <http://www.tandfonline.com/doi/abs/10.2752/175303712X13316289505260>
- Peel, E., Douglas, M., Parry, O., & Lawton, J. (2010). Type 2 diabetes and dog walking: Patients' longitudinal perspectives about implementing and sustaining physical activity. *The British Journal of General Practice*, 60, 570-577. doi:10.3399/bjgp10X515061
- Poresky, R. H., & Daniels, A. M. (1998). Demographics of pet presence and attachment. *Anthrozoös*, 11, 236-241. Retrieved from <http://www.tandfonline.com/doi/citedby/10.2752/089279398787000508?scroll=top&needAccess=true>
- Posel, D. R., & Casale, D. M. (2011). Relative standing and subjective well-being in South Africa: The role of perceptions. *Social Indicators Research*, 104(2), 195-223. Retrieved from <http://www.jstor.org/stable/41476598>
- Prato-Previde, E., Fallani, G., & Valsecch, P. (2006). Gender differences in owners interacting with pet dogs: An observational study. *Ethology*, 112(1), 64-73. doi:10.1111/j.1439-0310.2006.01123.x

- Quinn, A. C. (2005). *An examination of the relations between human attachment, pet attachment, depression, and anxiety* (Unpublished doctoral dissertation). Iowa State University, Iowa. Retrieved from <http://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=2850&context=rtd>
- Ramírez, M. T. G., & Hernandez, R. (2014). Benefits of dog ownership: Comparative study of equivalent samples. *Journal of Veterinary Behavior, 9*, 311-315. Retrieved from <http://dx.doi.org/10.1016/j.jveb.2014.08.002>
- Raven-Hart, R. (1967). *Before Van Riebeeck: Callers at South Africa from 1488 to 1652*. Cape Town, South Africa: Struik.
- Realo, A., & Dobewall, H. (2011). Does life satisfaction change with age? A comparison of Estonia, Finland, Latvia, and Sweden. *Journal of Research in Personality, 45*(3), 297-308. doi:10.1016/j.jrp.2011.03.004
- Rice, V. (2000). *Handbook of stress, coping and health: Implications for nursing research, theory and practice*. London, UK: Sage.
- Richardson, N. (2014). *The effects of physical activity on perceived stress, anxiety and life satisfaction* (Unpublished master's thesis). Dublin Business School, Ireland. Retrieved from http://esource.dbs.ie/bitstream/handle/10788/2230/ba_richardson_n_2014.pdf?sequence=1
- Rijken, M., & Beek, S. (2011). About cats and dogs ... Reconsidering the relationship between pet ownership and health related outcomes in community-dwelling elderly. *Social Indicators Research, 102*(3), 373-388. doi:10.1007/s11205-010-9690-8
- Risley-Curtiss, C. (2010). Social work practitioners and the human-companion bond: A national study. *Social Work, 55*(1), 38-46. doi:10.1093/sw/55.1.38
- Risley-Curtiss, C., Holley, L. C., & Wolf, S. (2006). The animal-human bond and ethnic diversity. *Social Work, 51*(3), 257-268. doi:10.1093/sw/51.3.257

- Rod, N. H., Gronbaek, M., Schnohr, P., Prescott, E., & Kristensen, T. S. (2009). Perceived stress as a risk factor for changes in health behaviour and cardiac risk profile: A longitudinal study. *Journal of Internal Medicine*, 266(5), 467-75. doi:10.1111/j.1365-2796.2009.02124.x
- Rogers, K. (2016). *Biophilia hypothesis*. Retrieved from <https://www.britannica.com/science/biophilia-hypothesis>
- Rolstad, S., Adler, J., & Ryden, A. (2011). Response burden and questionnaire length: Is shorter better? A review and meta-analysis. *Value in Health*, 14(8), 1101-1108. Retrieved from <http://dx.doi.org/10.1016/j.jval.2011.06.003>
- Russow, L. M. (2002). Ethical implications of the human-animal bond in the laboratory. *Institute for Laboratory Animal Research*, 43(1), 33-37. Retrieved from <https://academic.oup.com/ilarjournal/article-abstract/43/1/33/846174/Ethical-Implications-of-the-Human-Animal-Bond-in>
- Sable, P. (2013). The pet connection: An attachment perspective. *Clinical Social Work Journal*, 41(1), 93-99. doi:10.1007/s10615-012-0405-2
- Samaha, M., & Hawi, N. S. (2016). Relationships among smartphone addiction, stress, academic performance, and satisfaction with life. *Computers in Human Behavior*, 57, 321-325. Retrieved from <http://dx.doi.org/10.1016/j.chb.2015.12.045>
- Saunders, M., Lewis, P., & Thornhill, A. (2016). *Research methods for business students* (7th ed.). London, UK: Pearson.
- Schiffirin, H. H., & Nelson, S. K. (2008). Stressed and happy? Investigating the relationship between happiness and perceived stress. *Journal of Happiness Studies*, 11, 33-39. doi:10.1007/s10902-008-9104-7
- Schlebusch, L. (2004). The development of a Stress Symptom Checklist. *South African Journal of Psychology*, 34(3), 327-349. doi:10.1177/008124630403400301

- Schlinger, H. (1996). How the human got its spots; A critical analysis of the just so story of evolutionary psychology. *Behaviour and Social Issues*, 1(4), 68-76. Retrieved from https://www.researchgate.net/publication/242203888_How_the_human_got_its_spots_A_critical_analysis_of_the_just_so_stories_of_evolutionary_psychology
- Schneider, M. S., & Harley, L. P. (2006). How dogs influence the evaluation of psychotherapists. *Anthrozoös*, 19(2), 128-142. Retrieved from <http://patasterapeutas.org/wp-content/uploads/2015/07/influenciaNaAvaliac%CC%A7a%CC%83oDoTerapeuta.pdf>
- Schoenfeld-Tacher, R., Kagan, L. R., & Wright, M. L. (2010). Comparison of strength of the human-animal bond between Hispanic and non-Hispanic owners of pet dogs and cats. *Journal of American Veterinary Medicine*, 236(5), 529-534. doi:10.2460/javma.236.5.529
- Seligman, M. E. P. (2011). *Flourish: A visionary new understanding of happiness and well-being*. New York, NY: Free Press.
- Seligman, M. E., & Csikszentmihalyi, M. (2000). Positive psychology. An introduction. *American Psychologist*, 55(1), 5-14. Retrieved from <http://dx.doi.org/10.1037/0003-066X.55.1.5>
- Selye, H. (1976). *The stress of life*. New York, NY: McGraw-Hill.
- Shao, L., & Diener, E. (1992). *Multilanguage comparability of life satisfaction and happiness measures in mainland Chinese and American Students* (Unpublished master's thesis). University of Illinois, Illinois. Retrieved from <https://wenku.baidu.com/view/25747b7d5acfa1c7aa00cc39.html>
- Shi, A. (2000). How access to urban potable water and sewerage connections affects child mortality. *World Bank Policy Research Working Paper*, No. 2274. Retrieved from SSRN: <http://ssrn.com/abstract=629124>

- Siegel, J. M. (2011). Pet ownership and health. In C. Blazina, G. Boyraz, & D. Shen-Miller (Eds.), *The psychology of the human-animal bond* (pp. 167-177). New York, NY: Springer. Retrieved from https://doi.org/10.1007/978-1-4419-9761-6_10
- Smolkovic, I., Fajfar, M., & Mlinaric, V. (2012). Attachment to pets and interpersonal relationships. *Journal of European Psychology Students*, 3, 15-23. Retrieved from https://www.researchgate.net/publication/286703203_Attachment_to_pets_and_interpersonal_relationships_Can_a_four-legged_friend_replace_a_two-legged_one
- Soons, J. P. M., & Kalmijn, M. (2009). Is marriage more than cohabitation? Well-being differences in 30 European countries. *Journal of Marriage and Family*, 71(5), 1141-1157. doi:10.1111/j.1741-3737.2009.00660.x
- Spicer, S. (2012). *Pets and their people: A sociological investigation into the pet-keeping practices of two demographically diverse samples of South Africans* (Unpublished doctoral dissertation). University of the Western Cape, South Africa. Retrieved from <http://hdl.handle.net/11394/3987>
- Spielberger, C. D., Vagg, P. R., & Wasala, C.F. (2003). Occupational stress: Job pressures and lack of support. In J. C. Quick, & L. E. Tetrick (Eds.), *Handbook of Occupational Health Psychology* (pp. 185-200). Washington, DC: American Psychological Association.
- Sprouse-Blum, A. S., Smith, G., Sugai, D., & Parsa, F. D. (2010). Understanding endorphins and their importance in pain management. *Hawaii Medical Journal*, 69, 70-71. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3104618/>
- Staats, S., Sears, K., & Pierfelice, L. (2006). Teachers' pets and why they have them: An investigation of the human-animal bond. *Journal of Applied Social Psychology*, 36(8), 1881-1891. doi:10.1111/j.0021-9029.2006.00086.x
- Stanca, L. (2009). With or without you? Measuring the quality of relational life throughout the world. *Journal of Socio-Economics*, 38(5), 834-842. Retrieved from <https://ideas.repec.org/p/mib/wpaper/144.html>

- Stenseng, F., & Phelps, J. (2013). Leisure and life satisfaction: The role of passion and life domain outcomes. *World Leisure Journal*, 55(4), 320-332. Retrieved from <http://dx.doi.org/10.1080/04419057.2013.836558>
- Stephens, A., & Wardle, J. (2012) Enjoying life and living longer. *Archives of Internal Medicine*, 172(3), 273-275. doi:10.1001/archinternmed.2011.1028
- Stevenson, B., & Wolfers, J. (2007). Marriage and divorce: Changes and their driving forces. *NBER Working Paper*, No. 12944. Retrieved from <http://www.nber.org/papers/w12944>
- Steyn, R., & Vawda, N. (2014). Job characteristics: Their relationship to job satisfaction, stress and depression. *Journal of Psychology in Africa*, 24(3), 281-284. Retrieved from <http://dx.doi.org/10.1080/14330237.2014.906076>
- Stone, A. A., Schwartz, J. E., Broderick, J. E., & Deaton, A. (2010). A snapshot of the age distribution of psychological well-being in the United States. *Proceedings of the National Academy of Sciences of the United States of America*, 107(22), 9985-9990. doi:10.1073/pnas.1003744107
- Strumpfer, D. J. W. (2006). Salutogenesis: A new paradigm. *South African Journal of Psychology*, 20(4), 265-276. Retrieved from <http://journals.sagepub.com/doi/abs/10.1177/008124639002000406>
- Stutzer, A., & Frey, B. S. (2006). Does marriage make people happy, or do happy people get married? *Journal of Socio-Economics*, 35(2), 326-247. Retrieved from <https://doi.org/10.1016/j.socec.2005.11.043>
- Suh, E. M., & Koo, J. (2008). Comparing subjective well-being across cultures and nations: The "what" and "why" questions. In M. Led, & R. J. Larsen (Eds.), *The science of subjective well-being* (pp. 414-430). New York, NY: Guildford Press.
- Suldo, S. M., Riley, K. N., & Shaffer, E. J. (2006). Academic correlates of children and adolescents' life satisfaction. *School Psychology International*, 27, 567-582. doi:10.1177/0143034306073411

- Surujlal, J., Van Zyl, Y., & Nolan, V. T. (2013). Perceived stress and coping skills of university student-athletes and the relationship with life satisfaction. *African Journal for Physical, Health Education, Recreation and Dance*, 19(4), 1047-1059. Retrieved from https://repository.nwu.ac.za/bitstream/handle/10394/11141/ajpherd_v19_n4_2_a9.pdf?sequence=1&isAllowed=y
- SurveyMonkey. (n.d.). *How it works*. Retrieved from https://www.surveymonkey.com/mp/take-a-tour/?ut_source=header
- Taylor, S. E. (2006). *Health psychology* (6th ed). New York, NY: McGraw-Hill.
- Tchernov, E., & Valla, F. F. (1996). Two new dogs, and other natufian dogs, from the Southern Levant. *Journal of Archaeological Science*, 24, 65-95. Retrieved from http://tortenelemszak.unimiskolc.hu/Hallgatoi_anyagok/BA_regeszet/oskori_kelet_forrasai/babos_o.pdf
- Terre Blanche, M., Durrheim, K., & Painter, D. (2006). *Research in practice: Applied methods for the social sciences* (2nd ed.). Cape Town, South Africa: UCT Press.
- Thomas, J. J., & Borrayo, E. A. (2016). The impact of perceived stress and psychosocial factors on missed class and work in college students. *Journal of College Counselling*, 19, 246-260. doi:10.1002/jocc.12047
- Thorpe, R., Simonsick, E., & Brach, J. (2006). Dog ownership, walking behavior, and maintained mobility in late life. *Journal of the American Geriatrics Society*, 5, 154-168. doi:10.1111/j.1532-5415.2006.00856.x
- Tiefenbach, T., & Kohlbacher, F. (2014). Subjective well-being across gender and age in Japan: An econometric analysis. *Gender, Lifespan and Quality of Life*, 53, 183-201. Retrieve from https://link.springer.com/chapter/10.1007/978-94-007-7829-0_12/fulltext.html#citeas

- Tower, R. B., & Nokota, M. (2006). Pet companionship and depression: Results from a United States internet sample. *Anthrozoös*, 19, 50-65. Retrieved from <http://www.tandfonline.com/doi/abs/10.2752/089279306785593874?journalCode=rfa20>
- Trei, L. (2006). *Social science researcher proposes overhaul of survey methodology*. Retrieved from <http://news.stanford.edu/pr/2006/prkrosnick-092706.html>
- Uchino, B. N., Berg, C. A., Smith, T. W., Pearce, G., & Skinner, M. (2006). Age-related differences in ambulatory blood pressure during daily stress: Evidence for greater blood pressure reactivity with age. *Psychology and Aging* 21(2), 231-239. doi:10.1037/0882-7974.21.2.231
- Van Beuningen, J. (2012). *The Satisfaction With Life Scale examining construct validity*. Discussion paper (2012209). The Hague: Statistics Netherlands. Retrieved from <https://www.cbs.nl/nl-nl/achtergrond/2012/26/the-satisfaction-with-life-scale-examining-construct-validity>
- Van der Colff, J. J., & Rothmann, S. (2014). Occupational stress of professional nurses in South Africa. *Journal of Psychology in Africa*, 24(4), 375-384. Retrieved from <http://dx.doi.org/10.1080/14330237.2014.980626>
- Van Kim, N. A., & Nelson, T. F. (2013). Vigorous physical activity, mental health, perceived stress, and socializing among college students. *American Journal of Health Promotion*, 28(1), 7-15. doi:10.4278/ajhp.111101-QUAN-395.
- Van Zyl, L. Z., & Rothmann, S. (2012). Beyond smiling: The evaluation of a positive psychological intervention aimed at student happiness. *Journal of Psychology in Africa*, 22(3), 369-384. Retrieved from <http://dx.doi.org/10.1080/14330237.2012.10820541>

- Vawda, N. B. M. (2003). *Perceived stress, coping behavior and health outcomes among South African undergraduate medical students* (Unpublished doctoral dissertation). University of Kwazulu-Natal, South Africa.
Retrieved from
https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUKEwjg2v_OmbvOAhWJL8AKHdwoAOEQFggrMAE&url=http%3A%2F%2Fresearchspace.ukzn.ac.za%2Fbitstream%2Fhandle%2F10413%2F7931%2FVawda_Naseema_B_M_2003.pdf%3Fsequence%3D1%26isAllowed%3Dy&usq=AFQjCNGRenri9a7siwOYyonujslEh9bCwg&sig2=kiGKWtDCocIQ3Lf_dCDK_A
- Vázquez, C., Duque, A., & Hervás, G. (2012). Satisfaction with Life Scale in a representative sample of Spanish adults: Validation and normative data. *Spanish Journal of Psychology*, 16, e82, 1-15. doi:10.1017/sjp.2013.82
- Veenhoven, R. (1991). Is happiness relative? *Social Indicators Research*, 24, 1-34.
Retrieved from <https://personal.eur.nl/veenhoven/Pub1990s/91a-full.pdf>
- Veenhoven, R. (2008). Healthy happiness: Effects of happiness on physical health and the consequences for preventive health care. *Journal of Happiness Studies*, 9, 449-464. Retrieve from
<https://link.springer.com/article/10.1007/s10902-006-9042-1>
- Vera-Villarreal, P., Urzúa, A., Celis-Atenas, P. P. K., & Silva, J. (2012). Evaluation of subjective well-being: Analysis of the Satisfaction with Life Scale in Chilean population. *Universitas Psychologica*, 11 (3), 719-727. Retrieved from <https://www.scopus.com/record/display.uri?eid=2-s2.0-84872475079&origin=inward&txGid=a9bd3fe9097140f453b39a896087a75d>
- Villalta-Gil, V., Roca, M., Gonzalez, N., Domenec, E., Cuca, B., Escanilla, A., & Haro, J. M. (2009). Dog-assisted therapy in the treatment of chronic schizophrenia inpatients. *Anthrozoös*, 22, 149-159.
doi:10.2752/175303709X434176

- Vitztum, C. (2012). Human–animal interaction: A concept analysis. *International Journal of Nursing Knowledge*, 24(1), 30-36. doi:10.1111/j.2047-3095.2012.01219.x
- Vrbanac, Z., Zecević, I., Ljubić, M., Belić, M., Stanin, D., . . . Žubčić, D. (2013). Animal assisted therapy and perception of loneliness in geriatric nursing home residents. *Collegium Antropologicum*, 37(3), 973-976. Retrieved from https://www.researchgate.net/publication/259204066_Animal_assisted_therapy_and_perception_of_loneliness_in_geriatric_nursing_home_residents
- Wade, S. T. (2017). Examining stress and pet/stuffed animal attachment levels with college students. *Social Sciences Research Journal*, 4(2), 1-13. Retrieved from <https://journals.tdl.org/ssrj/index.php/ssrj/article/view/40/26>
- Wagner, C., Botha, A., & Mentz, M. (2012). Developing a research topic and planning the research project. In C. Wagner, B. Kawulich, & M. Garner (Eds.), *Doing social research: A global context* (pp. 12-27). New York, NY: McGraw-Hill.
- Walker, S.P., Esterhuysen, K. G. F., & Van Lill, L. (2010). The role of coping responses in the relationship between perceived stress and satisfaction with life amongst chronic pain patients. *Southern African Journal of Anaesthesia and Analgesia*, 16(5), 13-17. doi:10.1080/22201173.2010.10872703
- Wan, C. K., Jaccard, J., & Ramey, S. L. (1996). The relationship between social support and life satisfaction as a function of family structure, *Journal of Marriage and the Family*, 58(2), 502-513. Retrieved from <http://www.jstor.org/stable/353513>
- Wells, D. L. (2009). The effects of animals on human health and well-being. *Journal of Social Issues*, 65(3), 523-543. doi:10.1111/j.1540-4560.2009.01612.x

- Wen Li, L., Yusof, H., Zakaria, N., & Ali, A. (2017). Health and nutritional status among pet owners and non-pet owners in Kuala Lumpur. *Journal of Humanities and Social Science*, 22(2), 104-112.
doi:10.9790/0837-220201104112
- Westway, M., Rheeder, P., Van Zyl, D., & Seager, J. (2003). Interpersonal and organizational dimensions of patients satisfaction; The moderating effects of health status. *International Journal for Quality in Health Care*, 15(4), 337-344. Retrieved from <https://doi.org/10.1093/intqhc/mzg042>
- Whitney, C. (2010). Social supports among college students and measures of alcohol use, perceived stress, satisfaction with life, emotional intelligence and coping. *Journal of Student Wellbeing*, 4(1), 49-67.
<http://dx.doi.org/10.21913/JSW.v4i1.588>
- Wiggett-Barnard C., & Steel, H. (2008). The experience of owning a guide dog. *Disability and Rehabilitation*, 30, 1014-1026
<http://dx.doi.org/10.1080/09638280701466517>
- Wills, T. A., & Shinar, O. (2000). Measuring perceived and received social support. In S. Cohen, L. G. Underwood, & B. H. Gottlieb (Eds.), *Social support measurement and intervention: A guide for health and social scientists* (pp. 86-135). New York, NY: Oxford University Press.
- Wilson, E. O. (1984). *Biophilia*. Cambridge, UK: Harvard University Press.
- Winefield, H. R., Black, A., & Chur-Hansen, A. (2008). Health effects of ownership of and attachment to companion animals, in an older population. *International Journal of Behavioral Medicine*, 15 (4), 303-310.
doi:10.1080/10705500802365532
- Wisdom, J. P., Saedi, G. A., & Green, C. A. (2009). Another breed of "service" animals: STARS study findings about pet ownership and recovery from serious mental illness. *American Journal of Orthopsychiatry*, 79, 430-436.
doi:10.1037/a0016812.
- Wong, K. (2013). Scrappy pets. *Scientific American*, 308(4), 24.
doi:10.1038/scientificamerican0413-24b

- Wood, L. J., Giles-Corti, B., & Bulsara, M. K. (2005). Pet connection: Pets as a conduit for social capital? *Social Science and Medicine*, *61*, 1159-1173. doi:10.1016/j.socscimed.2005.01.017
- Wood, L. J., Giles-Corti, B., Bulsara, M. K., & Bosch, D. A. (2007). More than a furry companion: The ripple effect of companion animals on neighbourhood interactions and sense of community. *Society & Animals*, *15*(1), 43-56. Retrieved from <https://www.animalsandsociety.org/human-animal-studies/society-and-animals-journal/articles-on-children/more-than-a-furry-companion-the-ripple-effect-of-companion-animals-on-neighborhood-interactions-and-sense-of-community/>
- Zaparanick, T. L. (2008). *A confirmatory factor analysis of the Lexington Attachment to Pets Scale* (Unpublished doctoral dissertation). University of Tennessee, Knoxville. Retrieved from http://trace.tennessee.edu/cgi/viewcontent.cgi?article=1420&context=utk_graddiss
- Zasloff, R. L. (1996). Measuring attachment to companion animals: A dog is not a cat is not a bird. *Applied Animal Behaviour Science*, *47*(1-2), 43-48. doi:10.1016/0168-1591(95)01009-2
- Zasloff, R. L., & Kidd, A. H. (1994). Attachment to feline companions. *Psychological Report*, *73*(3), 747-752. doi:10.2466/pr0.1994.74.3.747
- Zhang, L. W., & Leung, J. P. (2002). Moderating effects of gender and age on the relationship between self-esteem and life satisfaction in mainland Chinese. *International Journal of Psychology*, *37*, 83-91. doi:10.1080/00207560143000252

APPENDIX A

DIGITAL CONSENT FORM (English and Afrikaans)



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvenoot • your knowledge partner

Stellenbosch University

Consent to participate in research

You are asked to participate in a research study conducted by Simonne Wright. The results of this study will contribute to a thesis in fulfilment of the requirements of a masters' degree in Psychology.

Please take some time to read the information presented here, which will explain the details of this project. Please contact me if you require further explanation or clarification of any aspect of the study. This study has been approved by the Research Ethics Committee (REC) at Stellenbosch University and will be conducted according to accepted and applicable national and international ethical guidelines and principles.

1. Purpose of the study

This study is intended to assess the relationship between pet attachment and subjective wellbeing, as well as between pet attachment and perceived stress, within a South African sample.

2. Procedure

If you choose to participate in this study, we will ask you to complete a short survey which could contain any of the following:

- Basic biographical questionnaire
- Comfort from Companion Animal Scale
- Perceived Stress Scale

Satisfaction With Life Scale

3. Ethical considerations

The survey is anonymous, for the purpose of protecting your identity and the information you disclose. Additionally, the researcher will keep all the collected data on a password-protected computer. The data will be kept for a period of five years.

You may choose to withdraw at any time during your completion of this survey – in which case no negative repercussions will follow.

If you have questions regarding your rights as a research subject, contact Ms Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development.

4. Identification of investigators

If you have any questions or concerns about the research, please feel free to contact me, Simonne Wright, at simonnewright87@gmail.com or alternatively dr MC le Roux at mclr@sun.ac.za.

5. Consent

I have read the above information and it is written in a language with which I am fluent and comfortable.

I understand that taking part in this study is voluntary and I have not been pressurised to take part.

I may choose to leave the study at any time and will not be penalised or prejudiced in any way.

All issues relating to confidentiality and use of the information I provide have been explained to my satisfaction.

I accept the invitation to participate and give consent that my responses may be used confidentially and anonymously.

Yes No



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvenoot • your knowledge partner

Universiteit Stellenbosch

Instemming om aan navorsing deel te neem

Jy word gevra om deel te neem aan 'n navorsingstudie deur Simonne Wright. Die resultate van hierdie studie sal bydra tot 'n tesis ter voldoening aan die vereistes van 'n meestersgraad in Sielkunde.

Lees asseblief die inligting hieronder waar die besonderhede van die projek verduidelik word. Kontak my asseblief indien u enige verdere verduideliking van enige aspek van die studie verlang. Hierdie studie is goedgekeur deur die Navorsingsetiekkomitee (NEK) van die Universiteit Stellenbosch en sal uitgevoer word volgens aanvaarde en toepaslike nasionale en internasionale etiese riglyne en beginsels.

1. Doel van die studie

Hierdie studie het ten doel om die verhouding tussen troeteldiergehegtheid en subjektiewe welstand, sowel as tussen troeteldiergehegtheid en waargenome stres in 'n Suid-Afrikaanse steekproef te evalueer.

2. Prosedure

As jy kies om deel te neem aan hierdie studie, sal ons jou vra om 'n kort opname wat enige van die volgende kan bevat, te voltooi.

Basiese biografiese vraelys

Troos-vanaf-troeteldierskaal

Waargenomestresskaal

Lewenstevredenheidskaal

3. Etiese oorwegings

Om jou identiteit en die inligting wat jy mag openbaar te beskerm, sal die opname anoniem gedoen word. Die navorser sal jou identiteit verder beskerm deur al die data wat ingesamel is op 'n wagwoord-beskermderekenaar te berg. Die data sal gehou word vir 'n tydperk van vyf jaar.

Jy kan te eniger tyd gedurende jou voltooiing van hierdie opname kies om te onttrek – in welke geval daar geen negatiewe gevolge sal wees nie.

As jy vrae oor jou regte as 'n deelnemer het, kontak Me Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] by die Afdeling Navorsingsontwikkeling.

4. Identifisering van ondersoekbeampies

Indien u enige vrae of bekommernisse oor die navorsing het, kontak my, Simonne Wright, by simonnewright87@gmail.com of andersins dr MC le Roux by mclr@sun.ac.za gerus.

5. Toestemming

Ek het die bostaande inligting geles en dit is geskryf in 'n taal waarmee ek vlot en gemaklik is.

Ek verstaan dat deelname aan hierdie studie vrywillig is. Ek is nie gedwing om deel te neem nie.

Ek kan enige tyd kies om die studie te verlaat en sal nie gepenaliseer of benadeel word nie.


Alle kwessies wat verband hou met die vertroulikheid en gebruik van die inligting wat ek verskaf, is bevredigend aan my verduidelik.

Ek aanvaar die uitnodiging om deel te neem en stem in dat my antwoorde vertroulik en anoniem gebruik mag word.

Ja Nee

APPENDIX B

DEMOGRAPHICAL QUESTIONNAIRE (English and Afrikaans)



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvenoot • your knowledge partner

The relationship between pet attachment, perceived stress and well-being, in a South African sample

Biographical questionnaire

* What is your current age?

* Sex:

Male

Female

* Race

Black

White

Coloured

Indian

Asian

Other

* **Marital status**

Single

Partnered

Married

Divorced

Widowed

* **What is your current education Level?**

No schooling completed

Matric or the equivalent (for example: GED)

Bachelor's degree

Honors degree

Master's degree

Doctorate degree

* **Employment status?**

Full time

Part time

Unemployed

Student

Homemaker/ housewife

Retired

* Which province do you live in?

- Eastern Cape
- Free State
- Gauteng
- KwaZulu-Natal
- Limpopo
- Mpumalanga
- Northern Cape
- North West
- Western Cape

* Do you currently own a pet?

- Yes
- No, but I **have owned** a pet in the past 6 months.
- No, and I **have not owned** a pet in the past 6 months



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvenoot • your knowledge partner

The relationship between pet attachment, perceived stress and well-being, in a South African sample

* What type of pet do you own (if you have more than one pet, answer with reference to the pet you are most attached to):

- Dog
- Cat
- Bird
- Fish
- Rabbit/ Guinea pig
- Mouse/ Rat/ Hamster
- Reptile
- Other



UNIVERSITEIT•STELLENBOSCH•UNIVERSITY
jou kennisvennoot • your knowledge partner

The relationship between pet attachment, perceived stress and well-being, in a South African sample

Biografiese vraelys

* Hoe oud is jy tans?

* Geslag:

Manlik

Vroulik

* Ras

Swart

Wit

Bruin

Indiër

Asiaat

Ander

* **Huwelikstatus**

- Enkellopend
- Woon saam
- Getroud
- Geskei
- Weduwee/Wewenaar

* **Wat is jou current huidige vlak van opleiding?**

- Geen skoolopleiding voltooi nie
- Matriek of gelykstaande (bv. AOO [GED])
- Baccalaureusgraad
- Honneursgraad
- Meestersgraad
- Doktorsgraad

* **Beroepstatus**

- Voltyds
- Deeltyds
- Werkloos
- Student
- Tuisteskepper
- Afgetree

* In watter provinsie woon jy?

- Oos-Kaap
- Vrystaat
- Gauteng
- KwaZulu-Natal
- Limpopo
- Mpumalanga
- Noord-Kaap
- Noordwes
- Wes-Kaap

* Het jy tans 'n troeteldier?

- Ja
- Nee, maar ek het die afgelope 6 maande 'n troeteldier gehad.
- Nee, en ek het nie die afgelope 6 maande 'n troeteldier gehad nie



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvennoot • your knowledge partner


The relationship between pet attachment, perceived stress and well-being, in a South African sample

* Watter tipe troeteldier het jy? (As jy meer as een het, antwoord met verwysing na die troeteldier waaraan jy die meeste geheg is):

- Hond
- Kat
- Voël
- Vis
- Haas / Marmot
- Muis / Rot / Hamster
- Reptiel
- Ander

APPENDIX C

COMFORT FROM COMPANION ANIMAL SCALE (CCAS) (English and Afrikaans)



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvennoot • your knowledge partner

The relationship between pet attachment, perceived stress and well-being, in a South African sample

Comfort from Companion Animal Scale (CCAS)

Please tell us whether you agree or disagree with some very brief statements about your favourite pet. For each statement, check whether you strongly agree, somewhat agree, somewhat disagree, or strongly disagree.

* My pet provides me with companionship.

Strongly disagree

Disagree

Agree

Strongly agree

* Having a pet gives me something to care for.

Strongly disagree

Disagree

Agree

Strongly agree

* My pet provides me with pleasurable activity.

- Strongly disagree
- Disagree
- Agree
- Strongly agree

* My pet is a source of constancy in my life.

- Strongly disagree
- Disagree
- Agree
- Strongly agree

* My pet makes me feel needed.

- Strongly disagree
- Disagree
- Agree
- Strongly agree

* My pet makes me laugh and play

- Strongly disagree
- Disagree
- Agree
- Strongly agree

* Having a pet gives me something to love.

- Strongly disagree
- Disagree
- Agree
- Strongly agree

* I get comfort from touching my pet.

- Strongly disagree
- Disagree
- Agree
- Strongly agree

* My pet makes me feel loved.

- Strongly disagree
- Disagree
- Agree
- Strongly agree

* I enjoy watching my pet.

- Strongly disagree
- Disagree
- Agree
- Strongly agree

* My pet makes me feel trusted.

- Strongly disagree
- Disagree
- Agree
- Strongly agree



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvennoot • your knowledge partner

The relationship between pet attachment, perceived stress and well-being, in a South African sample

Troos- vanaf-troeteldierskaal
(*Comfort from Companion Animal Scale*)

Sê asseblief vir ons of jy met 'n paar kort stellings oor jou gunsteling troeteldier saamstem of nie saamstem nie. Dui by elke stelling aan of jy beslis saamstem, ietwat saamstem, ietwat verskil, beslis verskil.

* **My troeteldier bied vir my kameraadskap.**

- Verskil beslis
- Verskil
- Stem saam
- Stem beslis saam

* **Om 'n troeteldier te hê gee my iets om te versorg?**

- Verskil beslis
- Verskil
- Stem saam
- Stem beslis saam

* My troeteldier bied vir my genotvolle aktiwiteit.

- Verskil beslis
- Verskil
- Stem saam
- Stem beslis saam

* My troeteldier is 'n bron van bestendigheid in my lewe

- Verskil beslis
- Verskil
- Stem saam
- Stem beslis saam

* My troeteldier laat my onmisbaar voel.

- Verskil beslis
- Verskil
- Stem saam
- Stem beslis saam

* My troeteldier laat my lag en speel.

- Verskil beslis
- Verskil
- Stem saam
- Stem beslis saam

* Om 'n troeteldier te hê gee my iets om lief te hê.

- Verskil beslis
- Verskil
- Stem saam
- Stem beslis saam

* Ek kry troos daaruit om aan my troeteldier te vat.

- Verskil beslis
- Verskil
- Stem saam
- Stem beslis saam

* Ek geniet dit om my troeteldier dop te hou.

- Verskil beslis
- Verskil
- Stem saam
- Stem beslis saam

* My troeteldier laat my geliefd voel.


- Verskil beslis
- Verskil
- Stem saam
- Stem beslis saam

* My troeteldier laat my voel ek word vertrou.

- Verskil beslis
- Verskil
- Stem saam
- Stem beslis saam

APPENDIX D

PERCEIVED STRESS SCALE (PSS) (English and Afrikaans)



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvennoot • your knowledge partner

The relationship between pet attachment, perceived stress and well-being, in a South African sample

Perceived Stress Scale (PSS-10)

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.

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

Never

Almost never

Sometimes

Fairly often

Very often

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

Never

Almost never

Sometimes

Fairly often

Very often

* In the last month, how often have you felt nervous and stressed?

Never

Almost never

Sometimes

Fairly often

Very often

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

Never

Almost never

Sometimes

Fairly often

Very often

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

Never

Almost never

Sometimes

Fairly often

Very often

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

Never

Almost never

Sometimes

Fairly often

Very often

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

- Never
- Almost never
- Sometimes
- Fairly often
- Very often

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

- Never
- Almost never
- Sometimes
- Fairly often
- Very often

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

- Never
- Almost never
- Sometimes
- Fairly often
- Very often

* In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

- Never
- Almost never
- Sometimes
- Fairly often
- Very often



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvennoot • your knowledge partner

The relationship between pet attachment, perceived stress and well-being, in a South African sample

Waargenomestresskaal
(*Perceived Stress Scale [PSS-10]*)

Die vrae in hierdie skaal vra jou oor jou gevoelens en gedagtes die afgelope maand. In elke geval sal jy gevra word om aan te dui hoe dikwels jy 'n sekere manier gevoel of gedink het.

* **Hoe dikwels die afgelope maand was jy ontsteld as gevolg van iets wat onverwags gebeur het?**

- Nooit
- Amper nooit
- Soms
- Redelik dikwels
- Baie dikwels

* **Hoe dikwels die afgelope maand het jy gevoel dat jy nie in staat was om die belangrike dinge in jou lewe te beheer nie**

- Nooit
- Amper nooit
- Soms
- Redelik dikwels
- Baie dikwels

* Hoe dikwels die afgelope maand het jy senuagtig en gespanne gevoel?

- Nooit
- Amper nooit
- Soms
- Redelik dikwels
- Baie dikwels

* Hoe dikwels die afgelope maand het jy seker gevoel oor jou vermoë om jou persoonlike probleme te hanteer?

- Nooit
- Amper nooit
- Soms
- Redelik dikwels
- Baie dikwels

* Hoe dikwels die afgelope maand het jy gevoel dinge verloop reg vir jou?

- Nooit
- Amper nooit
- Soms
- Redelik dikwels
- Baie dikwels

* Hoe dikwels die afgelope maand het jy gevind jy kan nie byhou met al die dinge wat jy moet doen nie?

- Nooit
- Amper nooit
- Soms
- Redelik dikwels
- Baie dikwels

* Hoe dikwels die afgelope maand was jy in staat om irritasies in jou lewe te beheer?

- Nooit
- Amper nooit
- Soms
- Redelik dikwels
- Baie dikwels

* Hoe dikwels die afgelope maand het jy gevoel dat jy dinge onder die knie kry/regkry?

- Nooit
- Amper nooit
- Soms
- Redelik dikwels
- Baie dikwels

* Hoe dikwels die afgelope maand was jy kwaad omdat dinge wat buite jou beheer was gebeur het?


- Nooit
- Amper nooit
- Soms
- Redelik dikwels
- Baie dikwels

* Hoe dikwels die afgelope maand het jy gevoel probleme hoop so op dat jy dit nie kan oorkom nie?

- Nooit
 - Amper nooit
 - Soms
 - Redelik dikwels
 - Baie dikwels
-

APPENDIX E

SATISFACTION WITH LIFE SCALE (SWLS) (English and Afrikaans)



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvennoot • your knowledge partner

The relationship between pet attachment, perceived stress and well-being, in a South African sample

Satisfaction With Life Scale (SWLS)

We have 5 statements below. Please indicate how much you agree with each statement. Please be open and honest in your response.

* **In most ways, my life is close to my ideal**

- Strongly disagree
- Disagree
- Slightly disagree
- Neither agree nor disagree
- Slightly agree
- Agree
- Strongly agree

* The conditions of my life are excellent

- Strongly disagree
- Disagree
- Slightly disagree
- Neither agree nor disagree
- Slightly agree
- Agree
- Strongly agree

* I am satisfied with my life

- Strongly disagree
- Disagree
- Slightly disagree
- Neither agree nor disagree
- Slightly agree
- Agree
- Strongly agree

* So far, I have gotten the important things I want in life

- Strongly disagree
- Disagree
- Slightly disagree
- Neither agree nor disagree
- Slightly agree
- Agree
- Strongly agree

* If I could live my life over, I would change almost nothing

- Strongly disagree
- Disagree
- Slightly disagree
- Neither agree nor disagree
- Slightly agree
- Agree
- Strongly agree



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvennoot • your knowledge partner

The relationship between pet attachment, perceived stress and well-being, in a South African sample

Lewenstevredenheidskaal
(*Satisfaction With Life Scale*)

Hieronder is vyf stellings. Dui asseblief aan hoeveel jy saamstem met elke stelling. Wees asseblief oop en eerlik met jou antwoord.

* **My lewe is meestal naby aan my ideaal**

- Verskil beslis
- Verskil
- Verskil effens
- Stem nie saam nie en verskil ook nie
- Stem effens saam
- Stem saam
- Stem beslis saam

* My lewensomstandighede is uitstekend

- Verskil beslis
- Verskil
- Verskil effens
- Stem nie saam nie en verskil ook nie
- Stem effens saam
- Stem saam
- Stem beslis saam

* Ek is tevrede met my lewe

- Verskil beslis
- Verskil
- Verskil effens
- Stem nie saam nie en verskil ook nie
- Stem effens saam
- Stem saam
- Stem beslis saam

* Tot dusver het ek die belangrike dinge wat ek in die lewe wil hê gekry


- Verskil beslis
- Verskil
- Verskil effens
- Stem nie saam nie en verskil ook nie
- Stem effens saam
- Stem saam
- Stem beslis saam

* As ek my lewe kon oorhê, sou ek byna niks verander nie

- Verskil beslis
- Verskil
- Verskil effens
- Stem nie saam nie en verskil ook nie
- Stem effens saam
- Stem saam
- Stem beslis saam

APPENDIX F


PERMISSION TO USE THE CCAS

Home 2 More 

ications

ates **Messages** Requests

(no subject) Report message · Block user




Simonne Wright

Nov 10, 2016

Dear Dr. Zasloff

I am currently doing my MA degree through Stellenbosch University. I will be investigating the relationship between pet attachment, perceived stress and subjective wellbeing in a sample from the South African population. I would love to use you Comfort from Companion Animals Scale if possible?

Warm regards
Simonne Wright




Lee Zasloff to you

Nov 10, 2016

Hi Simonne,

Sure - that would be fine. I'd be very interested to know what you find out.



Simonne Wright

Nov 10, 2016

Dear Dr. Zasloff

APPENDIX G

ETHICAL CLEARANCE FROM THE RESEARCH ETHICS COMMITTEE



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvenoot • your knowledge partner

Approval Notice New Application

09-Nov-2016
Wright, Simone SL

Proposal #: SU-HSD-003803

Title: The relationship between pet attachment, perceived stress and well-being in a South African population

Dear Miss Simone Wright,

Your **New Application** received on **07-Oct-2016**, was reviewed
Please note the following information about your approved research proposal:

Proposal Approval Period: **31-Oct-2016 -30-Oct-2019**

General comments:

The researcher is reminded to ensure that the surveys to be used are not subject to copyright and if so, to obtain written consent to use such surveys/instruments before commencing with the study.

Please take note of the general Investigator Responsibilities attached to this letter. You may commence with your research after complying fully with these guidelines.

Please remember to use your **proposal number (SU-HSD-003803)** on any documents or correspondence with the REC concerning your research proposal.

Please note that the REC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

Also note that a progress report should be submitted to the Committee before the approval period has expired if a continuation is required. The Committee will then consider the continuation of the project for a further year (if necessary).

This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki and the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health). Annually a number of projects may be selected randomly for an external audit.

National Health Research Ethics Committee (NHREC) registration number REC-050411-032.

We wish you the best as you conduct your research.

If you have any questions or need further help, please contact the REC office at .

Included Documents:

DESC Report

REC: Humanities New Application

Sincerely,

Clarissa Graham

REC Coordinator

Research Ethics Committee: Human Research (Humanities)

