The Psychometric properties of the Coleman Dog Attitude Scale and Owner-Pet Relationship Scale-Modified: A South African Study

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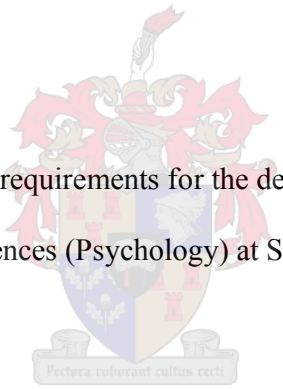

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Declaration

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ABSTRACT

This study set out to establish the suitability of using the C-DAS and OPRS-M in the South African context. South Africa is a vibrant and diverse country and also one of the leading countries with regards to pet-ownership (Maharaj, 2017). It is for this reason that this study set out to establish the reliability and validity of the C-DAS and OPRS-M in South Africa.

In order to do this, measures developed in the USA and Norway were translated from the initial English into Afrikaans. The English and Afrikaans versions were then put into an electronic format using SUrveys, the University of Stellenbosch's electronic survey site.

The measures were administered along with a biographical information questionnaire and two additional measures that have already been proven valid and reliable in the South African context. These two measures are the LAPS and the PAS-M. The LAPS measures people's attachment to pets, just like the OPRS-M measures people's attachment to pets. The PAS-M measures people's attitudes towards pets, like the C-DAS measures people's attitudes to dogs.

The total sample for this study consisted of 535 current or past pet owners. The participants had to be South African citizens over the age of 18. The Cronbach's alpha for the C-DAS was found to be .98 which means that is a reliable measure to use in South Africa. Correlations run between the C-DAS and the PAS-M indicate that the C-DAS is a valid measure of attitudes towards dogs in South Africa. The Cronbach's alpha for the OPRS-M was .94 which indicates that it is a valid measure to use in South Africa. Correlations run between the OPRS-M and the LAPS indicate that the OPRS-M is a valid measure of attachment to dogs in South Africa.

Participants were invited to take part in this study via email invitations and links on social media such as Facebook. Anyone with the link to the survey could complete it. It was also optimised for mobile so participants could complete it on their tablets or cell phones.

After the data was collected, it was analysed using SPSS 25, Statistica 13 and Lavaan. The data analysis revealed the measures to be valid and reliable in the South African context.

Key words: C-DAS; OPRS-M; PAS-M, LAPS; reliability; validity; human-animal interaction; psychometric properties; attachment; attitude; dogs; pets; correlations; measuring instruments; scales; Coleman Dog Attitude Scale; Pet Attitude Scale – Modified; Owner-Pet Relationship Scale – Modified; Lexington Attachment to Pets Scale

OPSOMMING

Hierdie studie het beoog om die gepastheid van die C-DAS en die OPRS-M se gebruik in die Suid Afrikaanse konteks vas te stel. Suid Afrika is ‘n lewendige en diverse land. Dit is ook een van die voorlopers met troeteldier eienaarskap, wêreld-wyd (Maharaj, 2017). Dit is vir hierdie rede dat hierdie studie beoog het om die betroubaarheid en geldigheid van die C-DAS en die OPRS-M in Suid Afrika te verken.

Om die bo-genoemde te bereik is meetings instrumente wat in die VSA en Noorweë ontwikkel is vanaf die oorspronkilike Engels na Afrikaans vertaal. Die Engelse en Afrikaanse weergawes van die instrumente is toe in elektroniese formaat geplaas deur om van SUrvey, die Universitiet se elektroniese vraelys webtuiste gebruik te maak.

Die C-DAS en OPRS-M het saam met ‘n biografiese vraelys en twee addisionele meetings instrumente wat ook gehegtheid en houdings meet verskyn. Hierdie twee meetings instruments is die PAS-M en die LAPS. Die PAS-M meet mense se houdings teenoor troeteldiere, nes die C-DAS mense se houdings teenoor honde meet en die LAPS meet gehegtheid aan troeteldiere, nes die OPRS-M gehegtheid aan honde meet.

Die aantal deelnemers wat die meetingsinstrumente voltooi het was 535. Die deelnemers het bestaan uit Suid Afrikaanse burgers bo die ouderdom van 18. Verder moes hulle ook huidige troeteldier eienaar wees of vantevore ‘n troeteldier besit het.

Die Cronbach’s alpha vir die C-DAS in hierde studie was bevind as .98 wat beteken dat dit ’n betroubare meetings instrument is om te gebruik in Suid Afrika. Korrelasies tussen die C-DAS en die PAS-M toon dat die C-DAS ’n geldige meetings instrument is om houdings teenoor

honde te meet in Suid Afrika. Die Cronbach's alpha vir die OPRS-M was .94 wat beteken dat dit 'n betroubare meetings instrument is om te gebruik in Suid Afrika. Korrelasies tussen die OPRS-M en die LAPS toon daarop dat die OPRS-M 'n geldige meetings instrument is om gehegtheid aan honde in Suid Afrika te meet.

Deelnemers is uitgenooi om deel te neem aan die studie deur middel van e-pos uitnodigings en skakels op sosiale media webtuistes, soos Facebook. Enige person met die skakel vir die vraelys kon dit voltooi. Die elektroniese weergave van die meetingsinstrumente was ook ge-optimiseer vir mobiele gebruik wat beteken dat die deelnemers dit op hul selfoon of tablette kon voltooi.

Nadat die data ingesamel is, was idt geanaliseer deur gebruik te maak van SPSS 25, Statistica 13 en Lavaan. Die data analiese het getoon dat al die meetingsinstrumente geldig en betroubaar is in die Suid Afrkaanse konteks.

Trefwoorde: C-DAS; OPRS-M; PAS-M; LAPS; betroubaarheid; gedigheid; mens-dier interaksie; psigometriese eienskappe; gehegtheid; houding; honde; troeteldiere; korrelasies; meetingsinstrumente; skale; Coleman Dog Attitude Scale; Pet Attitude Scale – Modified; Owner-Pet Relationship Scale – Modified; Lexington Attachment to Pets Scale

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This thesis is dedicated to my late grandmother Dr. Ria du Toit.

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LIST OF ABBREVIATIONS

AAI	Animal-Assisted Intervention
AGFI	Adjusted Goodness of Fit Index
AIDS	Acquired Immunodeficiency Syndrome
ANOVA	Analysis of Variance
APA	American Psychological Association
BrAtt	Attachment to the Cat
C-DAS	Coleman Dog Attitude Scale
CCAS	Comfort from Companion Animal Scale
CFA	Confirmatory Factor Analysis
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CSAWPBS	The Centre for the Study of Animal Wellness Pet Bonding Scale
DAQ	Attitude toward Dogs
DAS	Dog Attitude Scale
DESC	Departmental Ethics Screening Committee
DF	Degrees of Freedom
EAS	Animal Empathy Scale
EEA	Environment of Evolutionary Adaptedness
EFA	Exploratory Factor Analysis
GFI	Goodness of Fit Index
HAB	Human-Animal Bond
HAI	Human-Animal Interaction
KR20	Kuder-Richardson

LAPS	Lexington Attachment to Pets Scale
LAPS-M	Lexington Attachment to Pets Scale – Mexican Version
LAVAAN	Latent Variable Analysis
M	Mean
MMPI	Minnesota Multiphasic Personality Inventory
MOPI	Measurement Of Pet Inventory
OPR	Owner-Pet Relationship
OPRS-M	Owner-Pet Relationship Scale Modified
PAQ	Pet Attachment Questionnaire
PAS	Pet Attitude scale
PAS-M	Pet Attitude Scale Modified
PGFI	Parsimony Goodness of Fit Index
PSS	Perceived Stress Scale
REC	Research Ethics Committee
RMSEA	Root Mean Square Error of Approximation
SD	Standard Deviation
SEM	Standard Error of Measurement
SME	Standard Measurement Error
SPSS	Statistical Package for the Social Sciences
SWLS	Satisfaction With Life Scale
USA	United States of America

CHAPTER 1

INTRODUCTION AND MOTIVATION

1.1 BACKGROUND INFORMATION ON THE STUDY TOPIC

In order to understand the purpose of this study, it is necessary to provide a short introduction on the history of Human-Animal Interaction (HAI) as well as the history of psychological testing in South Africa.

1.1.1 History of Human-Animal Interaction (HAI)

O'Haire (2010) states that fossil evidence shows that humans and animals have lived alongside one another for at least 500 000 years. Studies indicate that this relationship has increased, evidence hereof being the high-ranking number of pet owners in Australia and the United States (Fine & Beck, 2015; O'Haire, 2010; Tielsch Goddard & Gilmer, 2015; Walsh, 2009). South Africa is one of the high pet-owning countries globally with the South African Pet Care (Dog) Industry Landscape Report for 2017 reporting that there are currently about 9 million dogs kept as pets in South Africa. Furthermore, South Africans consider their pets to be members of their families (Maharaj, 2017).

Shipman (2010, p. 519) created the term "*the animal connection"* which the author states has been an integral part of human development for the past 2.6 million years. To understand the evolution of any species, characteristics in the modern form of the species must be identified and traced back through time.

Having pets and taking care of them is what makes us human. At present, there are three main characteristics of *Homo Sapiens sp.* These are the use of and creation of tools, the use of symbolic behaviour and the creation of language as well as the domestication of plants and animals (Shipman, 2010). According to Shipman (2010), a fourth characteristic exists, that which she calls *"the animal connection"*. The author is of the opinion that the fourth evolutionary characteristic serves an encompassing role of the other three characteristics and it

also ties the other three characteristics together. "The animal connection comprises an increasingly intimate and reciprocal set of interactions between animals and humans (i.e., members of the genus *Homo*) starting~ 2.6 million years ago" (Shipman, 2010, p. 519). The relationship between humans and animals developed from the initial observation and exploitation of animals by humans. A modern example hereof can be found in the cross-species adoption of animals by humans, also called cross-species alloparenting, where the animal is adopted into the human family as one of the family members (Shipman, 2010).

Serpell (2015) emphasises that although archaeological evidence indicating the close relationship between humans and animals exists, there is little historical evidence of the relationship between ordinary people and their pets. The historical evidence that does exist focuses mostly on the rich and famous people in society. Thus our knowledge of how ordinary people related and interacted with their pets in the past remains speculative (Serpell, 2015).

However, the role of animals in the treatment of human diseases and illnesses has been historically documented in a few cases, albeit mostly in instances concerning those who could afford it. During the Age of Enlightenment, the historical period starting in the late seventeenth and early eighteenth centuries (Montoya, 2009), the public perception of animals changed. This, according to Serpell (2015), has been very well documented. It is within this time, the late seventeenth century, that John Locke encouraged pet ownership among children. This was due to the socializing function of pet ownership brought about by the responsibility of taking care of and nurturing a pet. This trend of teaching children important ethical lessons continued during the eighteenth and nineteenth century, where compassion for animals and their welfare was used as themes in children's literature (Serpell, 2015).

During the late eighteenth century, theories about the socialising function of animals spread to the treatment of mental illnesses. The earliest documented of these interventions was done in England at The York Retreat by William Tuke (Serpell, 2015). The York retreat used

treatment modalities that were more enlightened than other institutions of that era. Patients were encouraged to write, read books and take part in handcrafting (Serpell, 2015). Furthermore, the patients were allowed to walk in the courtyards of the retreat which was home to various small domestic animals including seagulls, various poultry as well as rabbits (Serpell, 2015). During the nineteenth century, the use of animals in the treatment of mental health illnesses became more popular and was a common feature of mental health institutions in England (Serpell, 2015). The therapeutic use of animals was recognised by Florence Nightingale, who stated that a small pet can be a very good companion to a sick person, especially in chronic, long term diseases (Nightingale, cited in Serpell, 2015).

Levinson (1997) presented a paper in 1961, reporting on his findings that a dog helped him conduct successful therapy sessions with troubled youth. Levinson was of the opinion that human ill health was caused by a disconnect from nature. Furthermore, he states that interaction with animals helps us heal by reconnecting us to this aspect of our humanity (Levinson, 1997).

In more recent years the therapeutic uses of the interaction between humans and animals and the companionship animals offer humans have been explored scientifically. This change in research modality was initiated by a study done by Friedmann, Katcher, Lynch and Thomas (1980). This study statistically proved that the outpatients of a cardiac care unit who were pet-owners outlived their non-pet-owning counterparts (Serpell, 2015). This study not only lead to further studies examining the health benefits of human-animal interaction, but also lead to the inquiry of exactly which mechanisms are responsible for these beneficial effects.

Serpell (2015) states that at least two mechanisms have been identified and survived academic scrutiny. These are firstly, the ability animals possess to catch our attention, subsequently activating a physiological response that has calming effects and induces relaxation. Secondly, companion animals serve as a buffer for stress and a source of social support (Serpell, 2015).

In conclusion, for the biggest part of human existence, animals have played a crucial role in the health and wellbeing of Homo Sapiens as a species, regardless of whether it was noticed and documented.

1.1.2 History of Psychological measuring instruments

Psychological assessments or as they are referred to in this study, psychological measuring instruments, aim to evaluate or measure (as the term suggests) certain concepts or characteristics. Simply put, a measure is a tool used to assess human behaviour (Foxcroft & Roodt, 2013). Various psychological measuring instruments exist, but for the purpose of this study there will be focussed only on the Coleman Dog Attitude Scale (C-DAS), the Pet Attitude Scale – Modified (PAS-M), the Owner-Pet Relationship Scale Modified (OPRS-M) and the Lexington Attachment to Pets Scale (LAPS). These measuring instruments are used in the field of human-animal interaction (HAI) (also referred to as Anthrozoology) (Wilson and Netting, 2012).

Measuring instruments can assist in measuring the effects an intervention had and identifying therapeutic needs. Measuring instruments can also be used to gather data to boost knowledge and understanding of human behaviour. It can also be used to inform policymaking (Foxcroft & Roodt, 2013).

According to Foxcroft and Roodt (2013), psychology only started to be a substantial science since the origin of the scientific method. This method is rooted in measurement and is built upon the combination of the following two principles: if something exists, it exists in some amount and if something exists in any amount, it can be measured (Foxcroft & Roodt, 2013). During the early 20th century psychological assessment started to progress more rapidly. This can be attributed to three factors. The first is advances in theories regarding human behaviour that serves a guiding purpose in the development of measuring instruments. The second is advances in the statistical methods used to analyse the data that is gathered via

measuring instruments, this also serves to identify relationships between variables as well as uncovering underlying aspects that are measured by the instruments. Thirdly, advances in the application of psychology in clinical, industrial, educational and military settings (Foxcroft & Roodt, 2013).

In concurrence with the evolution of a more humanitarian way of treating mentally disabled and disturbed people, psychological assessments grew in popularity. This was due to the fact that in order to treat a patient, mental illnesses and disorders had to be identified and diagnosed correctly. This lead to the development of standardised measuring instruments. World War I furthered the need for the development of measuring instruments as large numbers of individuals had to be assessed in order to assign them to the appropriate positions (Foxcroft & Roodt, 2013).

During the period between the two World Wars, critics identified the various limitations and weaknesses of existing measures. This ultimately led to the development of the Minnesota Multiphasic Personality Inventory (MMPI) in 1943 which initiated a new era of objective, structured and standardised measures. The MMPI is important as it emphasised a focus on the use of empirical data to evaluate the meaning of test results (Foxcroft & Roodt, 2013).

During the 1940s and the period of World War II, innovative test development technologies such as factor analysis were used in the creation of measuring instruments. Legal changes by the American Psychological Association (APA) limiting the scope of practice of psychological assessment to only clinical psychologists resulted in a decline in the use of psychological measuring instruments. This lasted from 1950 to 1970 (Foxcroft & Roodt, 2013). Since the late 20th century and early 21st century, multiculturalism has become the norm in various countries. This resulted in the need to create culture-free tests; this was found to be impossible as no test response can be completely free of cultural influences. The focus was thus moved to create measuring instruments that had minimal cultural bias.

During the 1980s and 1990s, cross-cultural test adaptation became the central focus of psychological testing. The norm for this practice was to develop and standardise a measuring instrument in the USA and thereafter to adapt it for use by the rest of the world (Foxcroft & Roodt, 2013). In opposition to this is the trend of countries to develop measuring instruments that are specific to their cultural contexts, this is commonly referred to as indigenous measures (Foxcroft & Roodt, 2013).

1.1.3 The development of modern psychological assessment in South Africa

Since South Africa was a British colony, the development of psychological testing in South Africa took more or less the same form as that of Europe and the USA. However, the socio-political climate of South Africa during that era influenced the cultural bias of various measures. The early psychological measures in South Africa were standardised only for white people. This lead to other nationalities being assessed with culturally biased instruments which inevitably affected their scores on these measures negatively (Foxcroft & Roodt, 2013).

After World War II the development of psychological measuring instruments gained momentum and test developers were becoming increasingly aware of the need to familiarise participants with the concepts in a measure, if they were not previously aware of those concepts. It was during this era that internationally established measures were administered in the South African context without investigating whether the measures should be adapted or revised for use in South Africa (Foxcroft & Roodt, 2013).

From the 1960s onward, the development of psychological measures took place along racial divides. Due to apartheid, people of different racial groups could not apply for the same jobs. Subsequently, more measures were developed that focussed on white people than other racial groups in South Africa (Foxcroft & Roodt, 2013). Thus, before the 1980s, Western models were adjusted to develop separate, but similar measures for the different ethnic and language populations in South Africa (Foxcroft & Roodt, 2013).

From the 1980s to the early 1990s the socio-political context in South Africa started to change and the laws of apartheid started being disbanded. This enabled people from other ethnic groups to apply for the same jobs that were previously only available to whites. Since the measures that have been developed up until this stage differed according to ethnicity, the application of separate measures for the same profession came under scrutiny (Foxcroft & Roodt, 2013). Two approaches were followed to address this problem; the first was to create measures for more than one ethnic group and to establish separate norms for the different ethnic groups, so that the groups could be evaluated in relation to the appropriate norms (Foxcroft & Roodt, 2013). The second approach to address this issue was to use psychological measures that were standardised on white people as well as the measures that were imported from overseas on different ethnic groups. It was during this era that researchers began to focus on issues such as test and item bias. The widespread use of culturally biased tests along with the perception that psychological measures were a way the Nationalist Government could continue to exclude non-white South Africans from education and job opportunities created a negative perception of psychological measures (Foxcroft & Roodt, 2013).

1.2 INTRODUCTION OF THE RESEARCH PROBLEM

Since 1994, psychological assessment in South Africa has been and is still shaped by legislation and the socio-political context. There exists a need for the development and use of measuring instruments that are unbiased as well as fair for people from all the ethnic populations in South Africa (Foxcroft & Roodt, 2013). Researchers and universities play an important role in investigating, adapting and developing measures that are applicable to the multi-cultural context of South Africa. Furthermore, test administrators need to be responsible and use the measuring instruments in an ethical manner. In conclusion, strict guidelines and laws have been established in order to ensure the proper training of individuals administering the measuring instruments (Foxcroft & Roodt, 2013).

Psychological measures and assessments are only of value to research if they are psychometrically sound and culturally appropriate. As well as only administered by well-trained professionals in an ethical manner (Foxcroft, Paterson, Le Roux & Herbst, 2004).

The field of Anthrozoology is spread over various scientific fields of enquiry, various occupations and transnational. Due to the diversity of this field, establishing sound parameters to create and develop as well as evaluate measuring instruments, is problematic (Wilson & Netting, 2012). In their evaluation of over 700 articles, Wilson and Netting (2012) found three main shortcomings of the measures that currently measure concepts in the HAI field. The first one is the inadequacy of the test development procedure and the inadequate evaluation of the measuring instrument. The second one is inadequate descriptions or descriptions lacking detail. The third main shortcoming is the presence of a lack of leadership and subsequent failure to ensure the continuous development and promotion of the measuring instrument.

In order to curb the three main shortcomings, Wilson and Netting (2012) propose a series of 12 steps to be followed when developing a measuring instrument in the field of anthrozoology. In order to understand the development of measuring instruments, these 12 steps will be explored here. Step 1 is to publish a manual containing the particulars of the measuring instrument, this consists of a complete description of the methodology of the instrument, how it was administered, a clear description of the population it was designed for as well as a description of the population it has been tested in, and an explanation of the reasons for collecting the data.

Step 2 is to refrain from copywriting the measuring instrument and to make it available for use by other parties. This includes a copy of the scale that should ideally be in the manual along with exact directions for use.

Step 3 is to give the measuring instrument a name that is relevant to its content. Here it is important to note that if a scale was revised or modified in any way, it has to be stated clearly.

Step 3 also includes a description of how the measure should be scored and how those scores should be interpreted.

Step 4 is to provide a rationale for the design and creation of the measuring instrument. It is also necessary to provide a conceptual framework of the instrument, the developers of the measuring instrument know this the best and any subsequent administrators of the measuring instrument will find a better understanding of the background behind the creation helpful.

Step 5 is the definition of the item or question selection. What the items are and why those specific items were selected for the measure needs to be explained. This definition should be included in the manual.

Step 6 is concerned with a description of all the revisions done to the measuring instrument or the method of development that was used, as well as current data indicating the validity and reliability of the latest version of the measure.

Step 7 urges you to describe the instructions on how to use and score the instrument. Here the focus is on the amount of time it takes to complete the instrument, the setting wherein it was administered to the participants, how missing data should be handled, and how change scores would be dealt with.

Step 8 focuses on the inclusion of all the instrument reference scores from various populations. The best would be if the sample included consisted of healthy pet owners, so this could be contrasted and compared in subsequent studies.

Step 9 is to include the reliability and validity scores for the measuring instrument itself as well as the validity and reliability of the measuring instrument when compared with other instruments that measure the same concepts.

Step 10 deals with the comparison of the measure with rival measures, focusing on the way the scale classifies participants at the extreme ends of the scale.

Step 11 states that each instrument should be tested by other individuals and not just by

the developers in order to establish the stability of the original validity values.

Step 12 is for the test developers to take responsibility for the measure over time. Instruments in HAI require continuous development and refinements through the course of their existence. A lot of research on the link between pet attitudes, attachment and personal wellbeing has been done, but most of the research lacks empirical support (Wilson & Netting, 2012). There are some instruments that have been proved to be consistently reliable and valid (Wilson & Netting, 2012).

The above information gives merit to the present study, which employed statistical analysis to explore the validity and reliability of the C-DAS and the OPRS-M in South Africa. These two measuring instruments were selected as they measure attitudes towards dogs and attachment to dogs, respectively. As previously stated, South Africa is one of the top dog-owning countries globally. The use of vigorous scientific methods was of the greatest importance in this study. In this way, empirical data will exist on the reliability and validity of these measuring instruments in the South African context. This will enable further studies in the field of anthrozoology. Wilson and Netting (2012) encourage researchers to document the psychometric properties of the various scales in different populations and to submit the data obtained so international comparisons can be drawn. By doing so, the path for subsequent studies are opened and the field of anthrozoology will be closer to consisting wholly of empirically valid information.

1.3 AIMS AND OBJECTIVES

Overall, the aim of the current study is to produce statistically sound evidence on the psychometric properties found in the C-DAS and OPRS-M when these two measuring instruments are applied in the South African context.

Firstly the present study aimed to produce scientifically sound, reliable and valid data through the use of a quantitative, cross-sectional, survey research design. The present study aimed for

a high level of methodological accuracy by ensuring a sufficient sample size was selected and meticulously documenting the statistical analyses.

Secondly, this study aimed to establish the validity as well as the reliability of the C-DAS and the OPRS-M in South Africa as well as to re-evaluate the reliability and validity of the LAPS and the PAS-M when used in South Africa.

1.4 RESEARCH QUESTIONS

Research questions are the questions a study attempts to answer. These questions are directly related to the aims and objectives of the study (Neuman, 2014). The primary research question of this study was: *Are the Coleman Dog Attitude Scale and Owner-Pet Relationship Scale – Modified valid and reliable questionnaires to use in South Africa?*

The secondary research question of this study was: *Can the Lexington Attachment to Pets Scale (LAPS) and the Pet Attitude Scale – Modified (PAS-M) be proven valid and reliable in South Africa again?* These two measuring instruments were selected to enable correlations between the C-DAS and the PAS-M and between the OPRS-M and the LAPS. This selection was made as the PAS-M measures attitude like the C-DAS does. Although the C-DAS focuses specifically on dogs and the PAS-M on pets, for the preliminary purpose of this study it is seen as sufficient for correlation analysis as dogs fall under the category of pets and one can assume that people who have positive attitudes to pets might have a positive attitude to dogs. Furthermore, the LAPS was used as, like the OPRS-M, it measures attachment. Although the LAPS measures attachment to pets and the OPRS-M measures attachment to dogs, it is seen as sufficient for correlation analysis as dogs fall under the category of pets and for the purpose of this study one can assume that people who have high attachment to pets will have high attachment to their dogs.

1.5 DEFINITION OF CONCEPTS

For the goal of the present study, a few concepts will be explained and elaborated on. These terms will be discussed in their specific relation to this study and the field of Human-Animal Interaction.

1.5.1 Attachment

Attachment is a strong emotional tie we have with significant people and animals in our lives. This tie enables us to feel safe and secure when we are interacting with these individuals or animals (Andreassen, Stenvold & Rudmin, 2013; Berk, 2009). Attachment between pet-owners and their pets is grounded in the same principles of attachment as is used by Ainsworth (1969) and Bowlby (1982), in their view of childhood development (Kurdek, 2008). The main goal of attachment is to create and maintain proximity to the attachment figure which is also the primary caregiver. Attachment behaviours are neurobiological in nature and due to the similarity in brain structures between animals and humans, attachment bonds are formed in similar ways (Julius, Beetz, Kotrschal, Turner & Uvnäs-Moberg, 2013). Attachment in this study will refer to the affectional ties that exist between pet-owners and their pets.

1.5.2 Attitude

An attitude is what leads a person to respond to a stimulus in a positive or negative way. It can be equated to a person's disposition towards a certain object or group of objects (Ajzen, 2011). Used in this study, attitude refers exclusively to the attitude of past and current pet-owners to their dogs or pets. The statements used in the C-DAS were based on the tripartite model of attitudes, thus the questions focus on the feelings, thoughts and behaviours of people towards dogs (Coleman, Green, Garthe, Worthington, Barker & Ingram, 2016). In this study, attitude is a colloquial term consisting of the combination of the feelings, behaviours and thoughts of people about their dogs and pets. The concept attitude refers to the way in which an individual thinks about and reacts to their dog and pet in the present study.

1.5.3 HAI

Human-animal interaction is a field of inquiry focussed on the interactions that take place between humans and animals as well as how these two populations form mutually beneficial relationships, to coexist peacefully. HAI is different to the human-animal bond (HAB) as the HAB forms only a specific aspect of inquiry in the larger field of HAI. Ostensibly, a wide area of research in the HAI field is focused on the HAB.

1.5.4 Human-Animal Bond (HAB)

There is quite a bit of disagreement regarding a concrete explanation of the HAB (Fine & Beck, 2015). Currently, it is assumed that the HAB consists of three distinct parts. The first part of the HAB is that there must be a connection between the human and the animal, this relationship must be bi-directional as well as continuous. The second part is that the relationship must be completely voluntary and unforced from either party. The third part of the HAB is that the relationship must persist over time and it should be reciprocal.

1.5.5 Likert Scale

A Likert scale is a rating scale that offers a number of possible answers that range between two poles and expresses to which degree the participant can choose to either agree or disagree with the statement given. It is used to capture an ordinal variable (Antonius, 2013).

1.5.6 Reliability

Reliability is the capacity of a measuring instrument to consistently deliver the same results (Acton & Miller, 2009). It is a quality found in a measurement method that delivers similar results in similar circumstances (Antonius, 2013). Foxcroft and Roodt (2013) state that reliability refers to the stability with which a scale measures what it measures.

1.5.7 Validity

Validity refers to what the measuring instrument measures and how well it measures this. Validity cannot be a specific property of a measuring instrument as a measuring instrument is valid only for a obtaining a particular aim. A measuring instrument can have either high or low validity for measuring that specific concept. Thus, validity can always be seen as the result of the interaction between the purpose of the measuring instrument and the specific sample it is used in. A measuring instrument may be valid for one sample, but not for another (Foxcroft & Roodt, 2013).

1.6 THESIS LAYOUT

The current chapter provided the background, rationale, research questions as well as the aims and objectives of this study. It also contained the definition of key concepts that were used in this study. Chapter 2 is concerned with the theories that are of relevance to the present study. Two theories pertaining to the Human-Animal Bond (HAB) focussing specifically on individuals' attitudes towards dogs and pets and individuals' attachment to dogs and pets will be discussed. The two theories are The Biophilia theory by E.O. Wilson and the Theory of Attachment by John Bowlby and Mary Ainsworth. In Chapter 3, an extensive review of relevant literature concerned with cross-cultural psychometric test adaptation, the HAB, attachment and attitude as well as previous research in the HAI field in South Africa is conducted. The methodology of the study is explained and discussed in Chapter 4. This includes the present study's research protocol, the study design, participants and their recruitment, the sampling strategy, a description of the measuring instruments, as well as the statistical analyses and ethical considerations of the study.

The pilot study and its design, participants, questionnaires as well as results are discussed in Chapter 5. In Chapter 6 the results of the study are reported. This is done in

subsections each relating to the statistical analysis of the four measuring instruments that were used in this study. Chapter 7 includes a summary of the study, a discussion of the findings of this study and the limitations of this study as well as recommendations for future research.

1.7 CHAPTER SUMMARY

This chapter covered the background, rationale, research questions, aims and objectives of the present study. A brief layout of the thesis was also provided. Chapter 2 is concerned with theories that are relevant to this study.

CHAPTER 2

THEORY

2.1 INTRODUCTION

A theory is an explanation of observed consistencies; it provides the researcher with a backdrop and rationale for the research that is conducted. Furthermore, it supplies the researcher with a framework wherein phenomena can be understood and evaluated, as well as wherein the research findings can be interpreted (Bryman, 2008).

In the present study, two aspects of human-animal interaction will be measured. The first aspect is people's attitudes towards dogs and pets. The second aspect is the attachment of people to their dogs and pets. In order to explain this, the Biophilia theory by Wilson (1984) and the Theory of Attachment by Ainsworth (1969) and Bowlby (1982) will be explored.

2.2 THE BIOPHILIA THEORY

E. O. Wilson developed the Biophilia hypothesis in 1984 (Clowney, 2013; Wilson, 1984). This theory puts forth that human beings and other species are intrinsically linked and depend on each other for their survival. According to the Biophillia theory, people need regular contact with nature as well as the natural world in order for normal, healthy development. It can be psychologically harmful to humans if they do not directly interact with other species (Krčmářová, 2009). Interaction with other species is part of our genetic compilation (Wilson, 1984), ostensibly interacting with dogs and other pets is part of our genes. The research thus suggests that humans are naturally prone to want to live with dogs, cats, pets and other animals.

Wilson (1984) defines *Biophilia* "as the innate tendency to focus on life and lifelike processes" (p. 1). He explains this definition by stating that humans are designed to explore

and connect with the larger living world and that this is an important and complicated part of every human's mental development.

According to Wilson (1984), our survival and existence depend on this attitude of exploring and interacting with the larger living, natural world. Furthermore, Wilson draws the conclusion that by examining other living creatures and appreciating their existence, we learn how to appreciate ourselves (1984). This, in turn, adds meaning to our lives. Wilson states that the more this concept of interchangeable gain between humans and animals is explored and researched, the more valuable it becomes. All humans have the capacity and need to be close to the natural world and animals (Wilson, 1984).

Wilson continues his explanation by quoting Darwin "wonder, astonishment and sublime devotion, fill and elevate the mind" (1984, p. 27). In relation to this study, this quote refers to the various health benefits attributed to owning a pet. By admiring and taking care of our pets we become joyful and happiness is experienced. Wilson defines humans as a biological species and believes that we form part of the natural collection of species on earth. This sense of unity with other species is innate in humans. As part of his argument Wilson (1984) mentions that over all cultures, animals are used as symbolic representations, a universal similarity that can almost only be likened to language development. Over most cultures, this is true.

Wilson (1984) likens animals to human family members and state that they become a type of surrogate to us. He explains the popularity of dog ownership by stating that dogs fit in with human ways of acting. This is due to their obedience and that they greet each other, similar to humans. As stated by Wilson "the family to whom they belong is part of their pack. They treat us like giant dogs, automatically alpha in rank, and clamour to be near us. We, in turn, respond warmly to their joyous greetings" (1984, p. 126). Dogs and humans get along so well because dogs descend from wolves who have strength in numbers. This has led to dogs being very sensitive to the emotions of others (Wilson, 1984). When dogs are inside the home, Wilson

says they take on the role of children. He uses the King Charles spaniel as an example. This dog was bred solely to be a comfort to emotionally distraught women. The spaniels gave their owners a sense of calm and they were often carried around by their owners, like mothers carry their infants (Wilson, 1984). Kinship to animals affects human emotion.

2.3 THEORY OF ATTACHMENT

John Bowlby, a British psychiatrist, developed the theory of attachment in 1969. Bowlby tried to conceptualise and clarify the relationship that exists between a human infant and their caregiver in his theory (Berk, 2009; Van der Horst, 2011). According to this theory, in order to get a required response from a caregiver, a human infant will display certain behaviours. Bowlby stresses two important aspects of attachment. Firstly, the continued maintenance of proximity to another mammal as well as the restoration of the proximity if it is disrupted, and secondly, the specificity of the other mammal (Nagasawa, Mogi & Kikusui, 2009; Slade, 2008). Bowlby came to the conclusion, that similar to the animal infants, human infants had a biologically programmed set of behaviours that they can use to keep their caregiver close to protect them, and to provide a safe environment to explore. This process is initiated by infants when they use signals to call to the caregivers. With time, an affectional bond forms between the infant and the attachment figure (Slade, 2008).

Bowlby paid much attention to the theme of separation and what this encompassed. The Environment of Evolutionary Adaptedness (EEA) is a concept that forms a part of the central theme of Attachment Theory. Bowlby used this construct to explain how and why humans inherited a natural disposition for attachment behaviour, as well as, using attachment behaviour as a crucial survival strategy, from their primate ancestors (Van der Horst, 2011).

Furthermore, Attachment Theory postulates that behaviour contributing to the tight bond between mothers and their children, has through the ages, evolved into an instinctive human

behaviour. This is due to natural selection. Thus, children attach themselves through using attachment behaviour due to the survival value that is inherent in social relationships, as derived from human evolutionary adaptedness (Van der Horst, 2011).

Van der Horst (2011) further explains this concept by stating that due to the dangers of predators, and violent members of their own species, ancient humans had to have instinctive behavioural systems to ensure their safety. Consequently, the bond between mother and child is the result of this essential behavioural system. Therefore, attachment behaviour is the behaviour that not only promotes proximity to caregivers, but also functions to maintain this proximity. The ultimate goal thus being ensuring safety against dangers.

Attachment develops in four stages (Berk, 2009). The first stage is called the *Pre-attachment phase.* This is composed by the first six weeks of life. The beginning stages of attachment behaviour can be observed in this phase. The baby will display attachment behaviour such as crying and making eye contact with the caregivers. However, it is still too soon to classify this as attachment due to the fact that the baby does not discern between its mother or primary caregiver and other adult humans who respond to its cries.

The second phase as stated in Berk (2009) is the *Attachment-in-the-making* phase. During this phase, the infant starts to respond differently to their primary caregiver, than they do to other people. This stage takes place from the age of six weeks until about six to eight months. During this phase, the infant learns that its behaviour can elicit a certain response. This forms the building blocks for the development of trust.

The *Clear cut* attachment phase begins at the age of six to eight months and lasts until about eighteen months or two years. In this phase, attachment to the primary caregiver is evident. Furthermore, babies start to display separation anxiety, which means that they become visibly upset when the primary caregiver leaves. This is, however, dependent on the temperament of the infant and the context of the situation. None the less, this visible upset is

accompanied by behaviour aimed at maintaining the proximity and attention of the primary caregiver. The infant will approach and climb on their primary caregiver, and will use their primary caregiver as a secure base from which they can safely explore their surroundings (Berk, 2009).

The fourth and final stage as put forth in Berk (2009) is the *Formation of a reciprocal relationship.* Like the earlier stages, this phase begins when the third one ends, thus from the age of eighteen months or two years and onwards. Due to the toddler's language acquisition and the understanding of how they can use language to influence the actions of the primary caregiver, they begin to negotiate with the primary caregiver. This ultimately leads to a sense of independence.

Nagasawa et al. (2009) looked at the biological basis of the attachment bond that exists between dog owners and their dogs. The authors found that oxytocin, a bonding hormone, was released in the dogs upon interacting with their owners. Nagasawa et al. (2009) expand on the theory of attachment established by Bowlby when they state that dogs, similar to human infants, utilise social cues in order to create and maintain an emotional connection with their caregivers. Upon being presented a new task in a novel setting the dog looked towards its caregiver or owner for reassurance.

Furthermore, Kurdek (2008, 2009) found that relationships between owners and pets can be seen as substitutes for attachment relationships with other people. Kurdek (2008, 2009) explored how a pet, specifically a dog, functions as an attachment figure. Although dogs do not have all the characteristics of human attachment figures, they do have many of the characteristics of attachment normally found between family members such as close proximity seeking and safe base. This indicates that pets do serve some of the attachment needs of people (Kurdek, 2008, 2009).

Attachment is the powerful affectionate tie connecting us with special people in our lives. Attachment also causes interaction between our loved ones and us to be pleasurable. Furthermore, it is attachment that causes us to be comforted by the nearness of our loved ones in times of stress (Berk, 2009).

2.4 CHAPTER SUMMARY

To date, no single theory exists to adequately explain Human-Animal Interaction (Fine, 2015). This chapter dealt with the theories that can explain humans' attachment and attitudes to animals. Chapter 3 provides an overview of the evaluation of the psychometric properties of a measuring instrument. This is accompanied by a discussion of relevant literature in the field of HAI and Psychometrics.

CHAPTER 3

LITERATURE REVIEW

3.1. INTRODUCTION

The focus of the present study is the psychometric evaluation of two measuring instruments within the field of human-animal interaction. The C-DAS aims to measure attitudes to dogs and the OPRS-M aims to measure attachment to dogs. Therefore this chapter will provide an explanation of human-animal interaction followed by a short discussion on the human-animal bond (HAB). Measuring instruments used in the HAI field that measures attachment and attitudes will be discussed as an indication of the existing state of measurement development in the field. Lastly, there will be a brief elaboration on what makes a measuring instrument a good instrument.

3.2. HUMAN-ANIMAL INTERACTION

The interactions and relationships between humans and animals occur in a variety of forms (Beetz & Bales, 2016). People and animals, especially dogs, work together in a variety of ways. Working dogs like the K9 unit of the police force being the most well-known. Some psychologists also use pets as co-therapists in order to help facilitate the therapeutic process, often when the clients are children (Levinson, 1997).

HAI consists of the dynamic and reciprocal emotional connections found between humans and animals and how these relationships benefit the physical and psychological wellbeing of both humans and animals (Esposito, McCardle, Maholmes, McCune, & Griffin, 2011).

Wilson and Netting (2012) found that there are more than 140 measuring instruments currently in existence that measure HAI. However, not all of the measures are valid and reliable (Wilson & Netting, 2012). If a measuring instrument is not valid or reliable, it should not be

used in similar studies. This means that researchers attempting to replicate the study will not be able to do so. If a measuring instrument is not valid, certainty cannot be guaranteed that it is, in fact, measuring the concept it proposes to measure (Durheim & Painter, 2011).

3.2.1 The Human-Animal Bond

Without taking the HAB into account, the relationship between humans and animals will not be completely understood. Boris Levinson is widely recognised as one of the pioneers of animal-assisted therapy (AAT). He created the term *the human-animal bond* (Fine & Beck, 2015; Levinson, 1997; Odendaal, 2000; Serpell, 2015; Shubert 2012; Walsh, 2009). Levinson postulated that animals provide humans an opportunity where they can learn to heal themselves emotionally, by assisting them on their path of emotional healing (Serpell, 2015). Moreover, Levinson in Serpell (2015) puts forth that animals have helped humans throughout evolution in such significant ways that they have become essential for our psychological as well as emotional wellbeing.

Fine and Beck (2015) state there is quite a bit of disagreement regarding a singular explanation of the human–animal bond. It has been found that the HAB has three distinct parts. The first part is that the connection between the human and animal(s) must be continuous and bidirectional. The second part states that the relationship must be completely voluntary, which suggests that the relationship should not be forced from either party. The third part states that the connection must persist over time and it should be reciprocal.

3.3. ATTITUDES TOWARD DOGS AND PETS

3.3.1. Introduction

According to Ajzen (2011), an attitude is that which leads a person to respond to a stimulus in either a positive or a negative way. It is the individual's disposition. Furthermore, since attitude is a hypothetical construct and thus inaccessible to direct observation, it has to be inferred from

responses that can be measured. These responses will reflect positive or negative feelings towards the subject matter or attitude object, which in this study is a dog or pets. In order to establish the attitude of an individual towards a subject, the individual's responses will be used to infer the attitudes of the individuals (Ajzen, 2011). Although the HAB is regarded as a universal phenomenon, and can occur in a number of different contexts, people's experience of the HAB will always be dependent on their socio-cultural background. This is due to the fact that a person's attitude comes from their cultural system and their beliefs (Jegatheesan, 2015). Accordingly, the attitudes of people towards dogs and pets can differ across social backgrounds and cultures. Interestingly, Lakestani, Donaldson, Verga and Waran (2011) did not find any differences based on the gender of their participants in their study regarding the attitudes of people to dogs.

3.3.2. How attitudes are inferred

Ajzen (2011) lists three types of response categories an individual can exhibit in a verbal response mode. The first response category that can be used to infer attitudes is the cognitions of the individual towards the attitude object, which in this study, is a pet or pets. This is called cognitive responses. Secondly, the affective response category consists of the individual's feelings towards pets. This can be seen in all the items in the measuring instruments relating to the feelings of the individual (Azjen, 2011). Lastly, the third response category given by Ajzen (2011) is the conative response category. Within this study, this consists of the expressions of the individual's behavioural intentions towards pets.

Attitudes can be inferred from different observable responses provided by the individual in the form of self-reports. It can also be collected from friends or family, people close to the individual in question or it can be based on the direct observation of the participant. Whilst measuring attitudes, there can be distinguished between verbal or non-verbal responses that serve to indicate the individual's beliefs, personal preferences, feelings and action

tendencies. According to Ajzen (2011), the results of empirical research indicate a hierarchical model of attitude. This hierarchy consists of evaluative attitudes at the top level. This is followed by cognition, affect and conation on a middle level which in turn is followed by beliefs, feelings and action tendencies on the bottom level. From this perspective, attitudes are believed to influence and determine overt behaviour regarding the attitude being researched. In this study, it is the attitudes of people towards dogs and pets.

3.4. INSTRUMENTS MEASURING ATTITUDES TO DOGS AND PETS

3.4.1. Introduction

Wilson and Netting (2012) established an overview of available instruments in the HAI field that assesses the characteristics of HAI. Their research concluded that there are currently more than 140 different measuring instruments that measure different constructs (Wilson and Netting, 2012). Some of the characteristics of HAI that are covered by these measures include empathy for animals as in the Animal Empathy Scale (AES) by Paul (2000) or attachment to cats as in the Attachment to the Cat (BrAtt) by Bradshaw and Limond (1997).

3.4.2. The Attitude Toward Dogs

In Wilson and Netting (2012), there is only one measuring instrument that measures attitudes toward dogs specifically. This is the Attitude towards dogs (DAQ), also called the Dog Attitude Scale (DAS). The DAQ was developed by Miura, Bradshaw and Tanida in 2000. The DAQ was created in order to test people's attitudes towards dogs in the United Kingdom and Japan (Miura et al., 2000). Their sample consisted of female and male university students both in the UK and Japan. Miura et al. (2000) used a back translation in order to ensure the equivalence of the instrument in the Japanese context. This measuring instrument has seven subscales when used in a Japanese population and five subscales when used in a UK population. The reported Cronbach's alpha for this measuring instrument is .79.

3.4.3. The Animal Attitude Scale

Herzog, Betchart and Pittman (1991) developed the *The Animal Attitude Scale*. This measuring instrument was used in Signal and Taylor (2007) as well as in Herzog, Grayson and McCord (2015) to measure people's attitudes toward the use and treatment of animals. This instrument has 20 items and is responses are scored on a 5-point Likert scale. The options for this measuring instrument are as follows: 1= *strongly disagree,* 2= *disagree,* 3= *undecided,* 4= *agree* and 5= *strongly agree*. The Animal Attitude Scale has a Cronbach's alpha of .91 in a sample of adults. Example items from this scale include *It is morally wrong to hunt wild animals just for sport* and *I do not think there is anything wrong with using animals in medical research*. This instrument requires 11 items to be reverse scored. Results on this measuring instrument is obtained by adding the scores, with a higher score indicating a positive attitude towards animals (Herzog, Grayson & McCord, 2015; Wilson & Netting, 2012).

3.4.4. The Pet Enhancement Scale

El-Alayi, Lystad, Webb, Hollingsworth and Ciolli (2006) developed *The Pet Enhancement Scale*. This measuring instrument was used by Beatson, Loughnan and Halloran (2009). The pet enhancement scale consists of 22 items. Of these items, 11 statements are negative and 11 are positive trait predictors. This forms the two subscales of the measuring instrument. Some of the example items on the positive subscale are *likeable* and *well-mannered*. *Disobedient* and *lazy* are example items from the negative subscale. The responses are captured on a 7-point scale that ranges from 1= *not at all characteristic* to 7= *completely characteristic*. Results for this measure are obtained by calculating the scores of the subscales, with an average given for each subscale. In a sample of adults, the positive subscale has a Cronbach's alpha of .85 and the negative subscale has a Cronbach's alpha of .89 (Beatson et al., 2009; El-Alayi et al., 2006).

3.4.5. The 4-item Special Treatment Scale

Beatson et al. (2009) created the *4-item Special Treatment Scale*. This measuring instrument consist of four statements that have to be rated on a 7-point scale. Selecting a higher digit on this measuring instrument indicates stronger agreement with the statement. On this measuring instrument only one item is reversed scored. *I think pets deserve to be pampered every now and then by going to a pet spa* and *Pet owners should consider taking their pet to meditation or yoga classes to improve (the pet's) temperament* are examples of the statements on this measure. In a sample of adults, this measure has a Cronbach's alpha of .75 (Beatson et al., 2009).

3.5 ATTACHMENT TO DOGS AND PETS

3.5.1. Introduction

Attachments are rooted in our neurobehavioural systems (Solomon, 2012). The behavioural systems of an animal or a human serves an adaptive purpose and is therefore goal driven. In attachment, the goal is either felt security or perceived security. Usually this is achieved by establishing as well as maintaining a close proximity to the attachment figure or primary caregiver (Berk, 2009; Solomon, 2012). In the field of HAI, the pet can potentially fill the role of the primary caregiver or attachment figure with the social support the pet offers its owner (Julius, Beetz, Kortschal, Turner & Uvnäs-Moberg, 2013). Similarly, the comfort felt from a companion animal can have calming effects on an individual, as the attachment figure would.

Attachment is associated with the neuropeptide oxytocin and thus has a biological basis. Oxytocin is the hormone that enables people and their pets, romantic and social partners, parents and children to form a bond or close emotional tie (Julius et al., 2013). Oxytocin has many functions, some of which include increasing pain thresholds, inducing calm and reducing anxiety. Furthermore, Oxytocin is positively associated with social interaction and increased

proximity within these interactions and is seen to enable social interaction. Research suggest that it is the similarities between the brains of animals and humans that causes oxytocin to be released in both humans and animals when pet-owners interact in a loving way with their pets, like petting or stroking them or when pets and pet-owners have reciprocal eye contact in the form of a loving gaze (Solomon, 2012). This effect is amplified when the interaction takes place between a pet and their trusted owner (Solomon, 2012). With regards to gender differences in attachment to pets, Andreassen, et al. (2013) found that women scored higher on the OPRS-M than men. This indicates that female pet-owners are more attached to their pets than male pet owners in that specific study. Similar gender differences were found in Winefield, Black and Chur-Hansen (2008) and in Quinn (2005), with females showing stronger attachment to their pets than their male counterparts.

3.6. INSTRUMENTS MEASURING ATTACHMENT TO PETS AND DOGS

3.6.1 Introduction

A total of 140 measuring instruments that measure characteristics of HAI were identified by Wilson and Netting (2012). Unfortunately, most of these instruments have not been used or reported on for quite some time. The instruments that will be used in this study in order to measure attachment to dogs and pets in the South African context are the Owner-Pet Relationship Scale - Modified (OPRS-M) and the Lexington Attachment to Pets Scale (LAPS), these instruments will be discussed in Chapter 4. In this section, other measuring instruments in the HAI field measuring attachment to pets and dogs will be discussed.

3.6.2 The CENSHARE Pet Attachment Scale (PAS)

Hollomb, Williams and Richards developed the *The CENSHARE Pet Attachment Scale* (PAS) in 1985 (cited in Anderson, 2007). Since its development, this measuring instrument has been used by Planchon, Templer, Stokes and Keller (2002) as well as Woodward and Baurer (2007).

Responses to this measure are captured on a 4-point Likert scale with 4= *Almost Never,* 3= *Sometimes,* 2= *Often* and 1= *Almost Always*. The CENSHARE Pet Attachment Scale has 27 items. *Your pet comes to greet you when you arrive* and *You are too busy to spend time with your pet* are two example items from this measuring instrument (Anderson, 2007). This instrument has two identified factors with 16 items loading onto the first factor called *relationship maintenance* and 11 items loading onto the second factor called *intimacy*. The Cronbach's alpha for this measuring instrument in a population consisting of adults aged 18 to 45 years is .83 for the first subscale *relationship maintenance* and .74 for the second subscale *intimacy* (Woodward & Bauer, 2007). Wilson and Netting (2012) reports that the CENSHARE Pet Attachment Scale has measures attachment and it has adequate face validity, construct validity and content validity (Wilson & Netting, 2012).

3.6.3 The Centre for the Study of Animal Wellness Pet Bonding Scale (CSAWPBS)

In 2002, Johnson and Meadows developed *The Centre for the Study of Animal Wellness Pet Bonding Scale* (CSAWPBS) (cited in Wilson & Netting, 2012). This measuring instrument is scored on a Likert scale with response options that range from 1= *More often true* to 5 = *More often false.* There are 28 items on this measuring instrument. *I will remember the dog visitor after my programme* and *I talk to the dog visitor* are example items from the measure. In a sample of disabled adults, this measuring instrument has a Cronbach's alpha of .89. It was designed to measure the attachment of individuals to the therapy animal in a therapeutic setting (Anderson, 2007).

3.6.4 The Comfort from Companion Animals Scale (CCAS)

Zasloff (1996) developed *The Comfort from Companion Animals Scale* (CCAS). It was also used by Castelli, Hart and Zasloff (2001). This measuring instrument focusses on the degree to which pets, specifically cats and dogs, provide their owners with emotional comfort and measures the attachment of individuals to their companion animals. This instrument is scored

on a 4-point Likert scale with 4= *Strongly agree,* 3= *Agree,* 2= *Disagree*, and 1= *Strongly disagree*. The Comfort form Companion Animals Scale contains 13 items and example items include *My pet makes me feel needed* and *My pet provides me with companionship* (Anderson, 2007). In a sample of adult males with AIDS this measuring instrument has a Cronbach's alpha of .85 (Wilson & Netting, 2012).

3.6.5 Pet Attachment Questionnaire (PAQ).

The *Pet Attachment Questionnaire* (PAQ) was developed by Zilcha-Mano, Mikulincer and Shaver (2011). The PAQ measures the attachment of owners to their pets. Responses to this measure are captured on a 7-point Likert scale with response options ranging from 1 = *not at all* to 7 = *very much.* This measuring instrument has two subscales *Anxiety* and *Avoidance*. It contains 26 items in total with 13 items on the first subscale and 13 items on the other. *I am not very attached to my pet* and *I'm often worried about what I'll do if something bad happens to my pet* are examples of the items in the PAQ. Items on this measuring instrument describe thoughts and feelings owners might have towards or about their pets. In a sample consisting of current and past pet-owners from the general population, the Cronbach's alpha for this instrument is .86 for the subscale titled *Anxiety* and .89 for the subscale called *Avoidance*. The PAQ also demonstrates a test-retest reliability of .75 for the *Anxiety* subscale and .80 for the *Avoidance* subscale (Zilcha-Mano et al., 2011).

3.7. ASSESSMENT MEASURES

According to Foxcroft and Roodt (2013), Assessment measures, like as the C-DAS and the OPRS-M, are generally developed for a specific purpose in a specific context. Thus the normative information used to interpret the scores obtained from the measures is bound by the characteristics of that specific sample. In the case of the C-DAS, a measure that was developed in the USA, the normative information would be based on the attitudes of Americans to their

dogs. Thus it is possible that the C-DAS might not be a valid measure when used in the South African context. In order for a test to be useful in the research process, it has to be psychometrically sound, used ethically and it must be culturally appropriate (Foxcroft & Roodt, 2013).

> "Psychological measures represent a scientific approach to enquiring into human behaviour; consequently they need to be applied in a standardised way and have to conform to rigorous scientific criteria (i.e. it must be empirically proved that they are reliable and valid and, especially in multi-cultural contexts, that they are not biased)." Foxcroft and Roodt (2013, p. 27)

3.8. RELIABILITY

The reliability of a measuring instrument depends on how consistently it measures what it aims to measures (Foxcroft & Roodt, 2013). If the same measuring instrument gives you the same result over multiple applications, it is reliable. In this study, internal consistency (Cronbach's alpha) will be used as a statistical tool to establish the reliability of the measure.

3.8.1 How to Establish Reliability

In order to obtain reliable measures from a specific instrument, the following three factors have to be looked at. What the entity is that we want to measure. In this study, there are two entities measured by the various instruments, Attachment to animals and Attitudes towards animals. These constructs have been thoroughly explained in 3.4 and 3.5 of this chapter. The second factor that needs to be understood is the nature of the measure we want to use. In this study, Likert type scales were used to gather the data. The third factor is how the data gathering process will be done, the rules on how to measure the object. This is done to ensure that all the administrations of the measures are same (Foxcroft & Roodt, 2013).

3.9. TYPES OF RELIABILITY

3.9.1 Introduction

There are various types of reliability, these include: Test-retest reliability, alternate form reliability, split-half reliability, inter-item consistency, inter-scorer reliability and intra-scorer reliability. These will be discussed below.

3.9.2 Test-retest reliability

During test-retest reliability, a measuring instrument is administered to the same group of test-takers, twice. The reliability coefficient hereof is simply the correlation between the two scores obtained on the two administrations. This reliability coefficient is also called the coefficient of stability (Foxcroft & Roodt, 2013).

Although this technique seems straightforward, it has a few disadvantages. The first hereof is the chances of systematic variance. This is related to the external physical environment the tests are conducted in, the internal emotional conditions of the respondents or even testing conditions such as different administrators. Other factors that can have an influence are memory or practice, otherwise called transfer effects. The test-retest reliability is also very time consuming and often expensive, which is why it is not used regularly. This type of reliability is not suitable for this study as the respondents are anonymous, so it would be impossible to find them again (Foxcroft & Roodt, 2013).

3.9.3 Alternate-form reliability

Alternate-form reliability is also called a coefficient of equivalence. This form of reliability is determined by administering two equivalent forms of the same measure to the same respondents on the same or two different occasions. If this type of reliability is used, it should be emphasised that the two measures should be truly equivalent. This means they should have the same number of items and take the same amount of time to complete, as well as the exact

same administration and scoring conditions. This form of reliability assessment is also very expensive and time-consuming, due to this, it is not used often (Foxcroft & Roodt, 2013).

3.9.4 Split-half reliability

Split-half reliability is obtained by dividing the measure into two equal halves with one administration of the test. This process is completed by calculating the correlation coefficient between these two sets of scores also referred to as internal consistency. The most frequent way this is done, is by splitting the even- and odd-item numbers. However, this yields an underestimation of the reliability coefficient, as it is based on only half of the test. The correlation coefficient for this form of reliability is calculated by using the Spearman-Brown formula (Foxcroft & Roodt, 2013).

3.9.5 Inter-item consistency

Inter-item consistency is another way to determine internal consistency. It is based on the consistency of responses to all the items in the measure. This is calculated by using the Kuder-Richardson (KR20) formula in measures that have a dichotomous (yes or no) response style (Foxcroft & Roodt, 2013). When the inter-item consistency of a measure consisting of multiple response categories, such as a Likert or ratio type scale, is examined, Cronbach's alpha is used (Foxcroft & Roodt, 2013). Two other forms of reliability is inter-scorer reliability, this depends on the scorers of the completed surveys and the other form of reliability is Intra-scorer reliability. This depends on internal factors inherent in the human scorer (Foxcroft & Roodt, 2013).

3.10. FACTORS INFLUENCING RELIABILITY

3.10.1 Introduction

The reliability of a measuring instrument can be affected by various factors. Due to the complexity of these factors, they will each be described below.

3.10.2 Respondent error

The first factor that can possibly have an influence on the reliability of a measuring instrument is respondent error. In short, this means the error was not due to any inherent parts of the measuring instrument and it is most possibly due to inherent qualities in the test-taker. There are four categories of respondent error. The first category is non-response error or Self-selection Bias. This error occurs when the test-taker does not complete the full assessment and only completes the questions they want to (Foxcroft & Roodt, 2013).

3.10.3 Response bias

The second factor is called Response bias. This occurs when the test-taker decides to respond in a set way to all of the items on the measure. There are four areas of bias associated with this factor. Extremity Bias occurs when the respondent selects either very positive or negative responses to all of the items in the measure. Neutrality Bias occurs when a respondent selects the central option for all the responses on the measure. Stringency and Leniency Bias occurs due to raters being very strict or lenient in their ratings. In this study, this has been avoided in two ways. The first is that the respondents had to choose from a list of set responses, thus there is no right or wrong. The second way this was avoided is by computerising the scoring process (Foxcroft & Roodt, 2013).

3.10.4 Acquiescence Bias

Acquiescence Bias happens when a respondent is in agreement with all the statements or items on a measure. In this study, this is dealt with by reverse scoring some of the items. This enables researchers to identify which respondents were not paying attention to the survey questions and merely filling in random answers. The Halo Effect (Foxcroft & Roodt, 2013) occurs when respondents are systematically influenced by positive and negative attributes of the object they are rating. Lastly is Social Desirability Bias. This occurs when a respondent answers in a

socially desirable or acceptable manner. Social Desirability Bias happens because people want to seem like good people (Foxcroft & Roodt, 2013).

3.10.5 Purposeful falsification

Purposeful falsification is another factor that influences the reliability of a measure. In this process, respondents intentionally misrepresent facts. They lie. This should not be confused with unconscious misrepresentation (Foxcroft & Roodt, 2013), which means that misrepresentations are done by accident. The respondents aren't lying on purpose.

3.10.6 Intra-individual factors

There are also intra-individual factors that can affect the reliability coefficients of a measure. This includes whether or not the measure is speeded. This is not a concern in the present study as the survey was not speeded. Variability in individual scores can have an influence on the reliability of a measure (Foxcroft & Roodt, 2013).

3.10.7 Administrative error

Lastly Administrative Error can have an influence on the reliability of a measure. This occurs when the administration procedures have not been the same for all the test-takers (Foxcroft & Roodt, 2013).

3.10.8 Reliability conclusion

Measuring instruments should deliver the same results over administrations. If it is not reliable, it cannot be valid. Thus it cannot be used for psychological assessments. In order to interpret the reliability of a measure, you have to be aware of several aspects. The reliability depends on the constructs being measured. In order for a measure to be seen as a reliable measure, it needs a Cronbach's alpha larger than 0.70, ideally above 0.80 or above 0.90 (Foxcroft & Roodt, 2013). Reliability can also be expressed as Standard Error of Measurement (SEM) or Standard Measurement Error (SME). The SEM can be used to interpret individual test scores in terms of reasonable limits (Foxcroft & Roodt, 2013).

3.11 VALIDITY

3.1.1 Introduction

The validity of a measuring instrument refers directly to what the instrument measures. Secondly, it is concerned with whether the measuring instrument measures what it proposes to measure. According to Foxcroft and Roodt (2013) a measure is valid for a specific purpose, at a specific time for a specific group. The measuring instruments used in this study have been developed in the USA (C-DAS) in 2016 (Coleman et al., 2016) and Norway (OPRS-M) (Andreassen, et al., 2013) in 2013. Thus these measuring instruments have been proven valid for these two countries, at these times and for their participants. The current study is therefore focused on exploring the validity of these two measures in the South African context.

3.12. FACTORS INFLUENCING THE VALIDITY OF A MEASURE

3.12.1 Introduction

There are various aspects of validity to consider. There are also several ways of determining the validity of a measure (Foxcroft & Roodt, 2013). It is important to note that validity functions on a continuum and has to meet the prerequisites of each one of the three consecutive parts to be seen as valid. These three validation procedures are called content description procedures, construct identification procedures and criterion prediction procedures, respectively. Each of these procedures, in turn, has its own methods of establishing their types of validity. Subsequently, this section will include descriptions of these three parts in consecutive order.

3.12.2 Content description procedures

Content description procedures have two important aspects to be aware of. The first hereof is face validity. Face validity is a non-statistical or non-psychometric type of validity. It refers to what the test appears to measure and not what the test actually measures. This is often achieved

by using phrasing that looks like it is appropriate for what the instrument tries to measure (Foxcroft & Roodt, 2013). To assess the face validity of a measure, a panel of experts in the subject field is normally tasked with assessing the look and feel or face validity of the measuring instrument. Once this process has been completed and the test developer is content with this facet, they can move on to the content validation procedure.

3.12.3 Content validity

Content validity is the second type of validity found in the content description procedures facet. It involves establishing whether the content of a measure really cover a representative sample of the aspect or behaviour that it proposes or attempts to measure. This type of validity is only partially a non-statistical procedure. There are two processes involved in determining content validity. The first one takes place during test construction. Like determining face validity, this is determined by a panel of experts. The second process is factor analysis. This forms an integral part of the psychometric evaluation done in the present study. Validity follows a continuum and only when a measure has content validity can it move on to the next level of validity exploration. This process is called construct validation (Foxcroft & Roodt, 2013).

In order for a measure to have content validity, the content of the measure must be broadly defined, to include the objectives of the measure, the application of research principles as well as the interpretation of the results and data. Lastly, factual knowledge must be included. Once again, only when a measure has been found to be valid on this level it can be evaluated on the next level (Foxcroft & Roodt, 2013).

3.12.4 Construct validity

Construct validity is the next step in the process of establishing the validity of a measure. It is a quantitative statistical analysis that is used to indicate the extent to which the measure measures the theoretical constructs it tries to measure (Foxcroft & Roodt, 2013). The correlation between these tests should merely be moderately high. If the correlation is perfect

the two measures are identical or the one is just a copy of the other. It is of utter importance to correlate tests with reputable measures to see if the measures measure the same concept (Foxcroft & Roodt, 2013).

3.12.5 Factorial validity

Factorial validity is another statistical technique that can be used to analyse the interrelationships between variables. The aim of factorial validity is to determine the underlying structure of a set of variables (Foxcroft & Roodt, 2013). This type of validity focuses on the underlying dimensions being tapped by the measuring instrument. In order to determine factorial validity, factor analysis has to be done.

3.12.6 Convergent validity

Convergent validity is demonstrated when a measure correlates highly with a measure that measures similar concepts, or a variable with which it should theoretically correlate with. Discriminant validity is present when a measure does not correlate highly with a variable or measure that it should theoretically not. This means the two constructs should be dissimilar (Foxcroft & Roodt, 2013).

3.12.7 Incremental validity

Incremental validity occurs when the measure explains in numbers the additional variance that occurs when the measure is compared to another set of measures. This will be done if the researcher is focussed on predicting a dependent variable (Foxcroft & Roodt, 2013). In the present study, there will not be a focus on this type of validity. With the nature of this study, it is not possible to indicate the directionality of the variables. Thus no dependent or independent variables will be identified.

3.12.8 Differential validity

Differential validity is present when a measure succeeds in distinguishing between different characteristics of individuals, organizations or groups. An example hereof is reported in Andreassen et al. (2013). They found that women and men scored differently on the OPRS-M. Only if a construct has met the above criteria of construct validity, can it proceed to the next validation level (Foxcroft & Roodt, 2013).

3.12.9 Criterion-prediction procedures

The third validation level is criterion-prediction procedures. Criterion-related validity is the process concerned with calculating a correlation coefficient between certain predictors and a criterion. There are two types of this validity. These are concurrent and predictive validity. Concurrent validity is concerned with the accuracy with which a measure can identify the concept it aims to measure (Foxcroft & Roodt, 2013).

Unitary validity is the whole body of types of validity present in the measure. This is the result of validity being a multi-dimensional construct. It is important to note here that the validation process of a measure is never wholly completed, nor that a single validation study in a specific context can prove the validity of the instrument in a global context (Foxcroft & Roodt, 2013).

3.12.10. Factors influencing the validity coefficient

There are several factors that can influence the validity coefficient. These will be discussed here briefly. The validity of a measure is “directly proportional to its reliability” (Foxcroft & Roodt, p. 65). The implication hereof is that the reliability of a measure places a limit on the validity of a measure. This is also referred to as a ceiling. Consequently, there is no use in trying to validate a measure that is unreliable. It is of further importance to note that reliability does not imply validity. It is a necessary, but not sufficient pre-existing condition for validity (Foxcroft & Roodt, 2013).

The second factor that can influence the validity of a measure is the differential impact subgroups may have on the measure. This emphasises the importance of establishing different validity coefficients for each of the subgroups contained within the sample (Foxcroft & Roodt, 2013). Sample homogeneity is also of note here. If the sample consists of respondents with mostly similar characteristics, for example black, female, university students, the scores might be very similar too (Foxcroft & Roodt, 2013).

The third factor is the linear relationship between the predictor and the criterion. This must be linear seeing that the correlation coefficient used is the Pearson product-moment coefficient (Foxcroft & Roodt, 2013). Criterion contamination is another factor which can have an impact on the validity. Lastly, moderator variables can also have an impact on the variable. (Foxcroft & Roodt, 2013). The measures in this study are scored electronically by a computer so the risk of the validity coefficient of the various measures being affected by moderator variables is removed.

3.13 ETHICAL CONSIDERATIONS IN MULTICULTURAL ASSESSMENTS

As the measures used in this study were internationally developed using norms from foreign populations, they are multicultural. Foxcroft (2011) lists several ethical considerations that need to be taken into account when conducting multicultural assessments. Those most applicable to the present study will be discussed here.

Considering when it is appropriate to use a test and when not is one of the first points Foxcroft (2011) mentions. In the context of this study, this ethical consideration was dealt with in the consent form. This enabled anyone who did not want to take part in this study to decline to complete the survey. This relates to the second consideration Foxcroft (2011) mentions. Following the correct protocol to obtain informed consent from the participants. As discussed above, this was done in the introduction of the survey. The third and fourth considerations

mentioned by Foxcroft (2011) is where and when to test the participants. As the survey was converted to an electronic format, the participants were able to complete it wherever and whenever they want to. All they needed was a device such as a phone, tablet or computer with internet access.

Foxcroft (2011) emphasises the need to establish the psychometric properties of the adapted test before it can be used with confidence. Not only must the reliability and validity of the measures be established, the equivalence of the two measures must also be looked at. For the purpose of this study, examining the equivalence of the measures will be done by exploratory factor analysis in the Pilot study and confirmatory factor analysis and exploratory factor analysis in the present study.

3.14 LANGUAGE AND TRANSLATION

Foxcroft (2011) states that from an ethical perspective individuals have the right to be assessed in their native language or language of choice. During the translation process, the translator needs to have an understanding of subtle nuances in both languages.

3.15 PREVIOUS RESEARCH DONE IN THE HAI FIELD IN SOUTH AFRICA

Research in the field of HAI in South Africa is sparse, but that does not mean it is non-existent. Le Roux, Swartz and Swart (2014) carried out an animal-assisted reading programme with Grade Three learners that had reading problems in the Western Cape. The intervention group read out loud to a dog and its owner and subsequently obtained higher scores on the Neale reading test. Similarly, Le Roux and Kemp (2009) examined the effects of having companion animals on anxiety and depression. Lubbe and Scholtz (2013) investigated the application of Animal Assisted Therapy for an adolescent. This was a qualitative case study. Wiggett (2006) explored the dynamics of guide dog ownership. Wyatt (2016) conducted a randomised control

study on the effect of an animal-assisted visitation programme for children with disabilities. In this study, Wyatt used the Measurement Of Pet Inventory (MOPI). This measuring instrument as developed to assess the effect of Animal-Assisted Interventions (AAI) have on the behaviour of individuals. The MOPI only has four items and it measures physical movement, attention span, physical movement, communication and compliance (Anderson, 2007). The response format for these four items is a 7-point Likert scale where 1 = *little to no evidence* and 7 = *very strong evidence.* Wyatt found the MOPI to have a Cronbach's alpha of .79 at pre-test and .83 at the post-test.

Buckle (2015) executed a randomised controlled study on the effects of AAI on the wellbeing of older people. Boyd (2015) examined the perceptions parents with children with disabilities had of horseback riding. Gerber (2016) administered the LAPS to a sample of university students in the Western Cape province of South Africa in order to explore the relationship between quality of life and attachment to a companion animal. Gerber found the LAPS to be valid and reliable in the South African context with an alpha of .94. Hawkridge (2017) investigated the perceptions of caregivers of adolescents with autism spectrum disorders on animal-assisted activities for these adolescents. Van Besouw (2017) conducted a case study on animal-assisted activities in a halfway facility, exploring the psychological, social and physical benefits of animal-assisted activities. In Van Besouw's (2017) study, the animal present was a dog. Wright (2018) explored the relationship between pet attachment, perceived stress and life satisfaction in a general public sample of South Africans. Wright (2018) used the Comfort from Companion Animal Scale (CCAS) and found a Cronbach's alpha of .94 for this scale, Wright (2018) also used the Perceived Stress Scale (PSS) and found a Cronbach's alpha of .90 and lastly Wright (2018) used the Satisfaction With Life Scale (SWLS) and found it to have a Cronbach's alpha of .89.

3.16 CHAPTER SUMMARY

This chapter reviewed Attachment, Attitudes, Validity and Reliability. Furthermore, there was looked at what could influence the reliability and validity of a measuring instrument. For the purpose of this study the exploration and reporting of psychometric properties was limited to internal consistency. Previous research done in the HAI field in South Africa was discussed. In Chapter 4, the methodology of the current study is discussed.

CHAPTER 4

METHODOLOGY

4.1 INTRODUCTION

The aim of the current study was to explore the psychometric properties of the C-DAS and the OPRS-M when administered in South Africa. In order to do so, a high standard of scientific rigour was applied while using a cross-sectional study design. Methodological soundness was strived for by using a large sample size (N=535), using SPSS 25 for the data analysis as well as assessing the data in partnership with the Statistic Department of Stellenbosch University and lastly by vigorously documenting the research process and adhering to research protocols.

In this chapter, the methodology and protocol of a quantitative cross-sectional study design will be discussed. Furthermore, the research design, measuring instruments, participants, sampling strategy, procedures and statistical analysis of this study will be discussed as well as the ethical considerations.

4.2 RESEARCH DESIGN

For the purpose of the present study, a quantitative research methodology and a cross-sectional research design will be used. This research design is often referred to as a survey design (Bryman, 2008). For the purpose of this study, it is important to note that although a survey will be used to collect the data from the participants, for clarification purposes the research design will be referred to as a cross-sectional design. This research design was chosen based upon the following characteristics as explained by Bryman (2008).

- *More than one case:* Researchers interested in variation often use a cross-sectional design as variation can only be found and explored if more than one case is examined. The variables that will be of interest in this study include gender, locality, age, and several other variables including but not limited to the following: home language and

gender (see Appendix E (English) and Appendix F (Afrikaans)). In order to increase the likelihood of encountering variation between cases, the present study analysed data from a sample of 535 participants..

- *At a single point in time:* In a cross-sectional research design, the data are collected more or less simultaneously. In the present study, the electronic survey was sent to each participant once and all the data for each particular individual was collected at one point in time. Due to the sampling strategy used, snowball sampling, and the low response rate the data were collected over a 24 month period from November 2016 to December 2018.
- *Quantitative or quantifiable data:* In order to enable the researcher to establish variation between cases and examine associations among variables, it is necessary to have quantifiable data.
- *Patterns of association:* A cross-sectional research design enables the researcher to examine variables as well as to identify relationships between the variables examined. Consequently, this research design only enables the researcher to identify a relationship between variables and not the direction of this relationship. This means that the researcher will probably not be able to determine causality.

The reliability and validity of the present study will depend on the measuring instruments themselves and not on the research design. A cross-sectional research design was selected to enable this. The possible replicability of this study is enabled by a thorough description of the following procedures: participant selection, the measuring instrument selected to form part of the survey, the administration of the survey as well as the way whereby the data is analysed. This data gathering procedure aimed to contribute to the ecological validity of the present study. This was done by allowing the respondents to complete the measure on their own at home. This eliminated negative testing effects such as bias and anxiety.

The present study implemented all of the methodological standards of a cross-sectional research design as described in this section. These methodological standards include: selecting more than one case, collecting the data from each individual at one point in time, delivering quantitative or quantifiable data, establishing patterns of association between variables whilst not aiming to establish causal relationships between variables (Bryman, 2008).

4.3. RESEARCH STRATEGY

A research strategy is a broad approach to conducting social research (Bryman, 2008). The research strategy best suited to the aims of the current study is a quantitative research methodology. The emphasis of this study was placed on quantification during the data collection and analysis procedures as well as the subsequent hypothesis testing. This enabled the researcher to investigate and explain the findings. The findings are based on solid numerical statistical evidence. The data describes the applicability of two internationally created measuring instruments in the South African context. One that measures attitudes to dogs and another that measures attachment to dogs.

According to Bryman (2008), a research design serves as a framework for the collection of data as well as the analysis thereof. It also guides the implementation of the research method and ultimately the testing of the hypothesis in order to answer the research question. The present study utilised a cross-sectional design, thus the data were obtained at one occasion for each respondent. All respondents completed the online survey described in section 4.5. of this chapter. The aim of the present study was to explore the psychometric properties of the English and Afrikaans versions of the measuring instruments (C-DAS, OPRS-M, LAPS and PAS-M) when applied within the South African context. This was done by firstly establishing the psychometric properties of these measuring instruments and then evaluating the psychometric

properties against international standards as well as previous findings by other researchers on the same measuring instruments.

4.4. PARTICIPANTS

4.4.1. Introduction

Pet ownership in South Africa is quite popular (Maharaj, 2017). Approximately 7.4 million to 9.1 million dogs are pets in South Africa. Furthermore, there are estimated to be between 2 million and 2.4 million pet cats in South Africa (Dray, 2018). South Africa also falls within the top 20 pet-owning countries in the world (Petsecure, 2019). This finding generates the necessity of reliable and valid measuring instruments that measures aspects of the HAI in South Africa. Aspects of the HAI that can be measured include people's attitudes towards pets and dogs as well as people's attachment to pets and dogs (Wilson & Netting, 2012).

The participants in the present study were South African citizens over the age of 18, who have met the inclusion criteria and exclusion criteria. The inclusion criteria are a) currently owning a pet or having done so at any stage in the past, b) South African citizenship, and c) the ability to understand and read English or Afrikaans because the questionnaires were only available in English and Afrikaans. The exclusion criterion was everyone under the age of 18 and individuals who are not Afrikaans or English capable. This was decided as individuals under the age of 18 are considered to be children by South African law (Children's Act no 38 of 2005) and reluctantly, anyone who cannot read and understand English or Afrikaans will not understand the survey questions as they are only available in English and Afrikaans.

4.4.2. Recruitment

Participants were recruited via word of mouth, email, mobile device text-based communication such as SMS and Whatsapp, social media sites such as Facebook and by direct approach. See Appendix O for the template used. Further recruitment of participants was enabled by snowball

sampling. A link was made available and anyone who had the link could complete the survey. Participants were encouraged to send the link to individuals they thought might be interested in taking part in this survey. Due to the anonymising function of the SUrvey site, full anonymity of all participants was assured.

4.4.3. Sampling

Snowball sampling (Bryman, 2008) was used to gather the data for this study. Although this is a form of convenience sampling and it is in no way random, it is sufficient as a sampling strategy for this study. The general population of adult South African English and Afrikaans speaking individuals is a fluctuating population as teens turn into adults every day.

Furthermore, there are many people emigrating and immigrating from and to our country daily. Thus the size of the adult population of South African English and Afrikaans speaking people fluctuates which makes it a shifting population. Bryman (2008) states that when it is not possible to establish the exact population, it is impossible to select a sample that is completely random. In order to obtain a sample representative of the population, probability sampling is the best sampling method to use (Bryman, 2008). However, non-probability sampling is often used in research conducted in the social sciences as it can be used in quantitative research to test theories that are considered to be universal (Durrheim & Painter, 2011).

Non-probability sampling was used in this study. The aspects considered to be universal in the in the current study are the attitudes of owners to dogs and pets and owner attachment to dogs and pets. The sampling was done by the researcher initially approaching organisations that are known to work for the well-being of animals or organisations that work with animals or, and individuals who currently own pets or individuals who have owned pets in the past. A similar sampling method was employed by González, Berumen and Hernández (2014) in their evaluation of a Spanish version of the LAPS, the LAPS-M in Mexico. In order to increase the

reliability and validity of the current study, the sample for the current study had to consist of at least 500 participants as a large sample has more power (Carlucci & Wright, 2012).

4.4.4. Description of participants

Table 4.1 displays the demographic characteristics of the participants. The participants of this study were predominantly Afrikaans (67.1%), female (74.4%), white (91.6%) and from the Western Cape Province in South Africa (79.3%). Current pet owners made up 90.3% of the study and 62.6% of the sample owned both a cat and a dog. Overall, the most beloved pet in the sample was a dog (66.4%). Most participants had two pets at the time of data collection (26.4%). Roughly half of the participants chose to complete the survey in Afrikaans (50.5%).

Table 4.1

Demographic Characteristics of the Sample (N=535)

		n	%
Language of participation	Afrikaans	270	50.5
	English	256	49.5
Home language	Afrikaans	359	67.1
	English	172	32.1
	Tshivenda	1	0.2
	Xhosa	3	0.6
Province	Eastern Cape	11	2.1
	Free State	1	0.2
	Gauteng	65	12.1
	KwaZulu-Natal	8	1.5
	Limpopo	2	0.4
	Mpumalanga	3	0.6
	North West	11	2.1
	Northern Cape	10	1.9
	Western Cape	424	79.3
Relationship status	Single	167	31.2
	In a relationship/engaged	86	16.1
	Married	224	41.9
	Unmarried but live together	58	10.8

Table 4.1 Continued

		n	%
Education level	No Formal Schooling	1	0.2
	Grade 9	24	4.5
	Matric	143	26.7
	Diploma	99	18.5
	Degree	71	13.3
	Honours Degree	95	17.8
	Master's Degree	67	12.5
	PhD	35	6.5
Pet ownership status	Current	483	90.3
	Past	52	9.7
Residence	Urban	71	13.3
	Rural	73	13.6
	Suburban Areas	180	33.6
	Towns	211	39.4
Ethnicity	Asian	2	0.4
	Black	4	0.7
	Coloured	21	3.9
	White	490	91.6
Gender	Female	398	74.4
	Male	137	25.6
Type of pets owned	Cat	30	5.6
	Cat and Dog	335	62.6
	Dog	166	31.0
	Neither	4	0.7
Current number of pets owned	None	50	9.3
	One	117	21.9
	Two	141	26.4
	Three	69	12.9
	Four	48	9.0
	Five	33	6.2
	Six or more	77	14.4
Favourite animal	Bird	4	0.7
	Cat	159	29.7
	Dog	355	66.4
	Fish	2	0.4
	Horse	6	1.1
	Rodent	2	0.4
	Other	7	1.3

4.5. MEASURING INSTRUMENTS

The measuring instruments were combined in an electronic online survey consisting of one biographical questionnaire and the four measuring instruments. The online survey enabled all the participants to complete the survey in the comfort of their own home or anywhere they had access to the internet. To enable the collection of data from a broader sample of South Africans, it was decided to translate the measuring instruments from the original English to Afrikaans using the Brislin method (Foxcroft & Roodt, 2013).

Out of the 11 official languages, it was decided that Afrikaans would be the only additional one to be used in the present study due to the financial and time constraints. All of the measuring instruments were translated from the original English format to an Afrikaans format by translators specialising in academic translations. Additionally, a backtranslation was done on each translated measure to insure that it fit for use in South Africa (Hambleton & Zenisky, 2011).

In the present study, the following measuring instruments were used to collect the data from the participants. They will be listed here and individually discussed below. Hardcopy examples of all the instruments can be found at the end of this thesis. The first instrument is the Biographical Information Questionnaire (see Appendix E & F), the second instrument used is the Coleman Dog Attitude Scale (C-DAS) (see Appendix G & H), the third measuring instrument used is the Pet Attitude Scale – Modified (PAS-M) (see Appendix I & J), the fourth measure used in this study is the Owner-Pet Relationship Scale – Modified (OPRS-M) (see Appendix K & L) the last measure used in this study is the Lexington Attachment to Pets Scale (LAPS) (see Appendix M & N).

4.5.1. Biographical Questionnaire

The biographical questionnaire used in this study is a self-report questionnaire that consists of 16 items. It was developed by the researcher. Of these items, 15 were forced-choice questions and one was an optional question. The items were chosen to gather information concerning the background of the respondents. *How old are you in years?* and *In which province are you currently residing?* as well as *What type of animal is your most beloved pet?* are example questions form the biographical questionnaire. Furthermore, the biographical survey served as a safety net. If a respondent indicated they were not within the inclusion criteria of being a South African citizen or a legal adult, they were redirected to the completion page. This ensured that the survey was only completed by adult South African citizens.

4.5.2. The Coleman Dog Attitude Scale (C-DAS)

Coleman et al. (2016) developed the The Coleman Dog Attitude Scale (C-DAS) in the USA. The C-DAS measures the attitudes of individuals toward dogs. This self-report measure contains twenty-four items consisting of simple statements. The response format for the C-DAS is on a 5-point Likert scale. The options on the Likert scale were as follows: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree, nor disagree*, 4 = *agree* and 5 = *strongly agree*. This measuring instrument contains no subscales and only two items on this measuring instrument are reversed scored, item 13 *I avoid dogs* and item 24 *I hate dogs*. *When I see a dog I smile* and *I love dog* are example items of the C-DAS. In order to calculate the final scores on the C-DAS the reverse scored items need to be reversed and then all the responses had to be added. A high score on the C-DAS indicates that the individual has a positive attitude toward dogs (Coleman et al., 2016).

This instrument has been used in the pilot study of this study (Smith, 2016). The sample it was used in consisted of adult South African past and current pet owners (N = 102). Smith

(2016) found the C-DAS to have a Cronbach's alpha of .964 for Afrikaans speaking South Africans (n = 31) and a Cronbach's alpha of .967 for English speaking South Africans (n = 71). More information on the pilot study is relayed in Chapter 5.

4.5.3. Pet Attitude Scale - Modified (PAS-M)

This PAS-M measures people's attitude to their pets. It is a self-report measure. This measuring instrument was amended from the Pet Attitude scale that was developed by Templer et al. in 1981 (Anderson, 2007). Munsell, Canfield, Templer, Tangan and Arikawa (2004) modified it as there were inconsistencies in the questions, with some of the questions relating to people who already owned pets and some to people who would potentially own pets in the future. The subsequent modifications made by Munsell et al. made the measure applicable to both people who currently owned pets and who potentially will own pets. This measuring instrument has 18 items that are in the form of statements that relate to the attitude of owners to their pets. The items each have a response range with 1 = *strongly disagree*, 2 = *moderately disagree*, 3 = *slightly disagree*, 4 = *unsure*, 5 = *slightly agree*, 6 = *moderately agree* and 7 = *strongly agree* (Anderson, 2007). When used within an adult population, the PAS-M has three factors. The three factors are 1) love and interaction, 2) pets in the home and 3) joy of pet ownership. The subscales and factors are the same as the three subscales are called *love and interaction, pets in the home* and *joy of pet ownership* (Anderson, 2007, Munsell et al., 2004). *I love pets* and *I would like to have a pet in my home* are example items form this measuring instrument. The PAS-M has six reversed scored items. These are items 4, 6, 9, 12, 13 and 17 which are first reversed scored and then totalled. The reversed scored item total is then added to the total of the remaining items and the sum is the respondent's score on the PAS-M. A lower score on the PAS-M indicates a more negative attitude towards pets and a higher score indicates a more positive attitude towards pets. In an adult population, the PAS-M has a Cronbach's alpha of .92 (Anderson, 2007; Munsell et al., 2004).

The PAS-M was used in the current study to calculate the correlation between the PAS-M and the C-DAS. This was done as both of these scales measure attitudes. If a scale measures attitudes towards pets it can be assumed that it will correlate with a scale that measures attitudes towards dogs as the two concepts, attitudes towards pets and attitudes towards dogs are related. Foxcroft and Roodt (2013) state that measures measuring related concepts can be used to correlated new measures measuring a similar concept. No evidence of this scale being used in South Africa has been found.

4.5.4. Owner-Pet Relationship Scale - Modified (OPRS-M)

The Owner-Pet Relationship Scale - Modified was based on the *Owner-Pet Relationship Scale* developed by Winefield, Black and Chur-hansen (2008). Andreassen, Stenvold and Rudmin (2013) modified it by narrowing the focus of the measuring instrument from focussing on pets to specifically focus on dogs. Andreassen et al. (2013) also edited the response options to enable item 15 to fit into the other four response options. The response range for items 1-14 is from 1 = *strongly disagree* to 4 = *strongly agree*. Item 15 allows the respondents to select the option that best reflects their answer with either 1 = *none of the options* or 2 = *one option* or 3 = *two options* or 4 = *all three options*. The OPRS-M consists of 15 items and is a self-report measure. The items are in the form of statements that intend to measure the attachment of an individual to their dog. Examples of these statements include *I love my dog* and *My dog is a member of my family*. The OPRS-M has a Cronbach's alpha of .84 in a population of Norwegian dog owners and has no reversed scored items (Andreassen, et al., 2013). Each participant's total score is calculated by adding all their responses. Andreassen et al. (2013) reported no subscales for this instrument. Their sample consisted of 502 participants whereof 438 (87%) were female and 63 (13%) were male. The mean age was 37 years (SD=12.8). All the items loaded onto on factor, accounting for 33% of the total variance (Andreassen, et al., 2013). This instrument has been used in South Africa in the pilot study of the present study (Cloete, 2016).

The sample consisted of adult South African past and present pet owners (N = 102). Cloete (2016) found the OPRS-M to have a Cronbach's alpha of .91 for English and Afrikaans speaking South Africans. More information on the pilot study is relayed in Chapter 5.

4.5.5. Lexington Attachment to Pets Scale (LAPS) (see Appendix M & N)

Johnson, Garrity and Stallones developed the Lexington Attachment to Pets Scale in 1992 (cited in Anderson, 2007). This self-report measure aims to measure owner's attachment to their pets. There are 23 items on this measuring instrument and the response format is a 5-point Likert scale with options ranging from 1 to 5 with 1 = *agree strongly*, 2 =*agree somewhat*, 3 = *disagree somewhat*, 4 = *disagree strongly* or 5 = *don't know or refuse*. For the purpose of the current study the researcher took away option 5 and changed the scoring of the instrument so that 4 = *agree strongly*, 3 =*agree somewhat*, 2 = *disagree somewhat*, 1 = *disagree strongly*.

This was done in order ensure that all the items of the four measuring instruments were forced responses and no items were optional. By removing the option *don't know or refuse*, participants were forced to select one of the other options. *I enjoy showing other people pictures of my pet* and *my pet understands me* (Anderson, 2007; Andreassen et al., 2013; González, et al., 2014) are example items. Items 8 and 21 are reversed scored on this measuring instrument. The individual's score on the LAPS is calculated by adjusting the revered scores and adding all the scores obtained.

A high score on the LAPS indicates the participant has a strong attachment to their pet (González, et al., 2014). This measuring instrument has three subscales, the first subscale is *general attachment*, the second subscale is *people substitution* and the last is *animal rights*. In a general population of pet owners in Mexico, González, et al. (2014) found the LAPS to have a Cronbach's alpha of .96 and three subscales. The LAPS has been used in South Africa with a population of South African university students over the age of 18 (N= 276) by Gerber (2016)

and found to have a Cronbach's alpha of .94. In the present study, the LAPS will be used to explore the correlation between the OPRS-M and the LAPS as they both measure attitudes.

4.6. PROCEDURES

4.6.1. Permission from relevant authorities

Ethics approval to conduct this study was obtained from the Departmental Ethics Screening Committee (DESC) of the Department of Psychology and the Human Research (Humanities) Ethics Committee (REC) of Stellenbosch University (ref: SU-HSD-002903). This study can be seen as a low-risk inquiry and the respondents were provided with a consent form to read on the first page of the survey (see Appendices C & D).

The consent form informed the participants of their rights and responsibilities. If they select *yes* the survey would open, if they select *no* they would be redirected to the completion page. Consequently, the consent form also informed the respondents that if they have experienced any psychological damage during their participation in the survey, for example someone who has lost a pet recently might be emotional upon answering questions about that particular pet, they could contact the researcher, who would refer them to a clinical psychologist. The consent form informed the participants of the estimated time it would take to complete the survey, that their participation was completely voluntary and that their responses were valued.

The anonymity of the participants was assured as there was no way the researcher or other parties could identify who the respondents were as they were not required to provide any of their personal details or their names to take part in the present study. To further assure the anonymity of the participants, the "anonymise" setting available in SUrvey was enabled. The

respondents did not receive an physical or monetary compensation. The data collected via the survey will be stored on a password-protected hard drive for a minimum of five years.

4.6.2. Informed consent

Informed consent is an ethical principle stating that upon inviting people to partake in a survey, they have to be adequately informed about the research and how their data will be used and stored. The participants must also agree to participate in the research of their own accord and without being pressured (Antonius, 2013). The participants were informed of their rights and that partaking in the survey was absolutely voluntary. This information was given to them in the format of an online consent form (see Appendices C & D). In order to progress to the survey questions, the participants had to select *yes* at the bottom of the consent form if they wished to take part in the survey. However, if the participants did not wish to continue with the survey, they simply had to select *no* and the survey-completed page would be displayed with the text *Thank you!* By choosing *no*, they were not harmed or disadvantaged in any way.

4.7. DATA COLLECTION

Data collection took place in the form of an electronic survey that consisted of five separate measuring instruments. The instruments used were the biographical survey (see Appendices E & F), the second measuring instrument used was the C-DAS (see Appendices G & H), the third measuring instrument used was the PAS-M (see Appendices I & J), the fourth measuring instrument used was the OPRS-M (see Appendices K & L) and the fifth measuring instrument used was the LAPS (see Appendices M & N). Respondents could complete the survey online as it was available on SUrvey, the University of Stellenbosch's online survey website. Access to the survey was only available to participants who had a link to the website.

By using the electronic internet-based format, participants were enabled to partake in this study irrespective of their geographical location. SUrvey was chosen as medium of online data collection as it was an easy way for the participants to respond to such a large number of questions and the website is governed by Stellenbosch University's data protection. An online survey further allows the researcher freedom from geographical boundaries as the participants could complete the survey anywhere as long as they had access to the internet. Using an electronic survey to gather data is also offers the benefit of speedy data collection. The data is immediately saved in the online data basis on SUrvey. Furthermore, the anonymity of the participants can be can be guaranteed, their responses are stored securely and overall costs are lowered (Miller, Johnston, Dunn, Fry, & Degenhardt, 2010) since there are no printing costs involved.

4.8. DATA ANALYSIS

After the data collection, the data had to be cleaned as the excel output form SUrvey could not be entered into SPSS 25 directly. After it was cleaned, the researcher analysed in with assistance from Professor Martin Kidd from the Division for Statistical Consultation of the University of Stellenbosch. The Statistical Package for the Social Science (SPSS) 25 as well as Statistica 13 and Lavaan were used to run the analysis of the data. The Cronbach's alpha (α) (Antonius, 2013; Bryman, 2008) for all four of the measures were established in order to establish the internal reliability for all the measures.

The Kaiser-Meyer-Olkin measure of sampling adequacy as well as Bartlett's test of sphericity were conducted in order to establish factorability. These methods were chosen to keep the data analysis as similar to the initial factor analysis done by Coleman et al. (2016) as possible. The research purpose of this study was to establish the factor loadings of the C-DAS and the OPRS-M in the South African context. Furthermore, after the initial exploratory factor analysis in the pilot study, a confirmatory factor analysis was conducted on the study data.

For the confirmatory factor analysis (Rust, 2012), the overall model fit was determined by examining fit indices. These are the Chi-Square test, the root mean square error of approximation (RMSEA) as well as the comparative fit index (CFI), the goodness of fit index (GFI) was also established as well as the adjusted goodness of fit index (AGFI) and the parsimony goodness of fit index (PGFI). Factor analysis can be used in order to predict the score a person might obtain on a new instrument if it loads on the same factors as an instrument that has been proven to accurately measure the same construct (Brace, Kemp & Snelgar, 2013). Correlations using Pearson's r (*r*) were done between the measuring instruments with the data obtained.

In order to explore language and gender differences for each of the measures, F-tests were run on the completion language and gender for each of the instruments. Cohen's D was also established in order to indicate effect size.

4.9 CHAPTER SUMMARY

In Chapter 4 the methodology, participants, measures, procedures, creation of the survey, the conduction of the pilot study and the statistical analysis of the current study were discussed. Chapter 5 contains a discussion of the Pilot Study. This includes its design, participants, questionnaires and results.

CHAPTER 5

PILOT STUDY

5.1 INTRODUCTION

In this chapter the pilot study, its design, participants, questionnaires and its results are discussed. A pilot study involves testing the research methodology out on a smaller sample. It is usually done in order to identify any difficulties that may arise in the data collection and data analysis of the main study (Bless, Higson-Smith & Kagee, 2009). The pilot study was used to deliver preliminary findings on the reliability and validity of the English and Afrikaans versions of the C-DAS and OPRS-M in the South African context. The pilot study was done by two honours students, Estie Cloete (2016) and Caitlin Smith (2016). Both Cloete (2016) and Smith (2016) each had one measuring instrument that was correlated with another measuring instrument that has already been proven to measure the construct in question. Smith (2016) evaluated the C-DAS. An exploratory factor analysis was done by her on the C-DAS, furthermore, Smith (2016) explored the correlation between the C-DAS and the OPRS-M. Cloete (2016) evaluated the OPRS-M. Similarly to Smith (2016), an exploratory factor analysis was conducted by Cloete (2016) on the OPRS-M. Moreover, Cloete (2016) looked at the correlation between the OPRS-M and the LAPS. Cronbach's alphas for both the C-DAS, OPRS-M and their correlatory counterparts the PAS-M and the LAPS were established.

5.2 DESIGN

The design for the pilot study was the same as the main study. A cross-sectional research design with a survey as mode of data collection was used. The pilot study was made up of two parts. One part focussed on the C-DAS and the PAS-M and the other part focused on the OPRS-M and the LAPS. Both parts of the Pilot study were run concurrently. Participants were contacted via snowball sampling and they received their invitations to take part in the survey via email.

The survey completed in the pilot study included the same instruments as the main study (see Appendices G to N).

5.3 PARTICIPANTS

The sample for the pilot study consisted of 102 participants. The pilot study had inclusion criteria set like the main study had. The participants were adult South African citizens who are currently pet-owners or have owned a pet before. The participants were English and Afrikaans speaking. Friends and family of Smith and Cloete were approached to take part in the research. The age of the participants ranged from 18 to 68 years old (mean = 30.93, SD = 13.66). Most of the participants identified as white (95.1%), female (69.6%), English speaking and residing in the Western Cape (57.8%). In Table 5.1, the demographic information of the pilot study participants is reported.

Table 5.1
Demographic Characteristics of the Pilot Study Sample (N=102)

		n	%
Language of participation	English	71	69.6
	Afrikaans	31	30.4
Home language	English	56	54.9
	Afrikaans	45	44.1
	Tshivenda	1	1.0
Province	Eastern Cape	1	1.0
	Gauteng	28	27.5
	Kwa-Zulu Natal	3	2.9
	Limpopo	1	1.0
	Northern Cape	8	7.8
	North-West Province	2	2.0
	Western Cape	59	57.8
Relationship status	Single	39	38.2
	In a relationship/engaged	32	31.4
	Married	29	28.4
	Unmarried but live together	2	2.0

Table 5.1
Demographic Characteristics of the Pilot study Sample (N=102) continued

		n	%
	Matric	30	29.4
	Diploma	12	11.8
	Degree	31	30.4
	Honours Degree	19	18.6
	Master's Degree	9	8.8
Current pet owners	Dog only	47	45.6
	Both dog and cat	55	53.4
Residence	Cities	14	13.7
	Farms	14	13.7
	Suburban Areas	39	38.2
	Towns	35	34.3
Race	Black	2	2.0
	Coloured	2	2.0
	Other	1	1.0
	White	97	95.1
Gender	Female	71	69.6
	Male	31	30.4
Type of pets owned	Dog	73	71.6
	Cat	32	31.4
	Fish	9	8.8
	Bird	5	4.9
	Reptile	3	2.9
	Horse	2	2.0
	Other species	1	1.0
Current number of pets owned	None	20	19.6
	One	23	22.5
	Two	19	18.6
	Three	13	12.7
	Four	14	13.7
	Five	3	2.9
	Six or more	10	9.8
Most beloved pet	Dog	82	80.4
	Cat	13	12.7
	Horse	3	2.9
	Reptiles	1	1.0
	Fish	1	1.0
	Other pets	2	2.0

5.4 DATA COLLECTION

The data collection for the pilot study commenced once ethical approval was granted (Cloete: SU-HSD-002443; Smith: SU-HSD-002442). A link to the survey was emailed to respondents who indicated they were willing to participate. The survey was made available for six weeks. The data was collected using SUrvey, the University of Stellenbosch's survey website.

5.5 STATISTICAL ANALYSIS

Once the data was collected, it was exported out of the Survey site in an excel format. This had to be entered into SPSS in order to be analysed. The data from SUrvey had to be cleaned as the excel sheet it came out in was not easy to understand. The data was analysed in collaboration with Professor Kidd at the Centre for Statistical Consultation. Cronbach's alpha was computed for all four of the measuring instruments used, this is the C-DAS, the PAS-M, the OPRS-M and the LAPS. By using principal component analysis, exploratory factor analysis with a varimax rotation was run on the data. Two tailed t-tests were used to look at biographical variances. Lastly the C-DAS was correlated with the PAS-M and the OPRS-M was correlated with the LAPS.

5.6 RESULTS

The pilot study revealed that the C-DAS has a Cronbach's alpha of .965 and that the PAS-M has a Cronbach's alpha of .87. The pilot study further revealed that the OPRS-M has a Cronbach's alpha of .91 and that the LAPS has a Cronbach's alpha of .93.

A three factor structure was revealed for both the C-DAS and the OPRS-M by the exploratory factor analysis in the pilot study. A four-factor structure was revealed for the PAS-M.

In the pilot study the C-DAS was significantly correlated with the PAS-M, r =.767, p =.000. A strong positive correlation between the C-DAS and the PAS-M was revealed. No statistically significant differences were found on the C-DAS based on gender or language. In the pilot study, the OPRS-M demonstrated a significant correlation with the LAPS, r =.458, p<.01. This reveals a strong positive correlation between the OPRS-M and the LAPS. No statistically significant differences were found on the OPRS-M based on gender or language. Overall, the pilot study revealed sufficient statistical evidence with regard to the validity and reliability of the instruments to conduct the main study.

5.7 LIMITATIONS

The pilot study had three main issues. The SUrvey site does not have a very user-friendly interface. The response options of the questionnaires were not always visible to the respondent. This meant that as the respondent was going down the list of questions on each measure, they had to keep scrolling up in order to see what the response categories were. Secondly, SUrvey had a setting selected that meant that for each participant a new email invitation link had to be created. This took a lot of time and meant that once the respondent has used their link, they could not forward it to other people to potentially increase the number of participants. Lastly, the way in which SUrvey converts the data into an excel format was not easy to read and had to be cleaned.

5.8 CHAPTER SUMMARY

The pilot study of the present study was covered in this chapter. The research design and methodology of the pilot study were described. It also included a description of the participants of the pilot study. The method of data collection was described as well as the data analysis.

Lastly, the results obtained in the pilot study were reported here. In Chapter 6 the results of the main study are reported.

CHAPTER 6

RESULTS

6.1 INTRODUCTION

The current study was aimed at addressing the research question: What are the psychometric properties of the C-DAS and OPRS-M in the South African context?

Chapter 6 presents an overview of the findings of the current study in an attempt to answer the above-mentioned question. This includes findings obtained through the statistical analysis of the data obtained from the questionnaires that composed the survey. The data was analysed in collaboration with Professor Kidd from the statistics department. Lavaan and Statistica 13 were used to establish the mean, standard deviation and Cronbach's alpha for all four of the measures. Cronbach's alpha was used as an indication of reliability (Foxcroft & Roodt, 2013) in South Africa. Pearsons' correlation coefficient (*r)* was used as an indication of construct validity (Foxcroft & Roodt, 2013) by correlating the measures in question with measures already proved to be valid in the South African context. Smith (2016) found the C-DAS and the PAS-M to have a positive correlation, r= .767, p=.000. Cloete (2016) found the OPRS-M and the LAPS to have a positive correlation, r=.458, p<.01. In the current study the C-DAS was correlated with the PAS-M and the OPRS-M was correlated with the LAPS. The Statistical Package for the Social Sciences (SPSS) 25 was used to run the basic descriptive data analysis and the exploratory factor analysis as well as the correlations.

The following statistical techniques were executed on the data. In order to establish factorability, exploratory factor analysis was done. Confirmatory factor analysis was run to confirm the goodness of fit and correlations were run to correlate the totals obtained for the scales and used as an indication of construct validity. F-tests were conducted to explore differences on the completion language and the gender of the participants. The measures of

central tendency and standard deviations as well as the skewness and kurtosis were established using Statistica 13.

6.2 CRONBACH'S ALPHA VALUES

Cronbach's alpha is used to test internal reliability. An indication of an acceptable level of internal reliability is usually .80, a level of .70 is satisfactory and a level of .60 is considered good (Bryman, 2008). The Cronbach's alphas obtained for the scales are reported in the below table.

Table 6.1
Cronbach's alpha

Measuring Instrument	Cronbach's Alpha
C-DAS	.98
PAS-M	.92
OPRS-M	.94
LAPS	.96

Note: C-DAS = Coleman Dog Attitude Scale; PAS-M = Pet Attitude Scale Modified; OPRS-M = Owner – Pet Relationship Scale – Modified; LAPS = Lexington Attachment to Pets Scale.

6.3 DESCRIPTIVE STATISTICS

Descriptive statistics enable us to summarise data and can serve as a helpful tool in understanding important aspects of our data set (Brace et al., 2015). The median and the mean are measures of central tendency in a distribution. They provide us with a central value around which the other values are distributed. The mean is the average of all scores that were obtained. It is sensitive to outliers. The median is the value occurring right at the middle of all scores obtained. It is not affected by outliers (Antonius, 2013).

The standard deviation is a measure indicating dispersion (Brace et al., 2015). The standard deviation can also be stated to be the square root of the sum of the squared deviations from the mean, divided by the number of participants. It is the most widely used measure of variation in a data set (Antonius, 2013). The range of scores are the minimum and maximum scores that can be obtained on the measuring instruments. The skewness refers to the symmetry in a distribution. The skewness of a distribution relates to the asymmetry of a distribution in

relation to the mean (Rasch, Kubinger & Yanagida, 2012). It can be positively skewed or negatively skewed. If a data set contains a larger proportion of scores toward its right-hand side than its left-hand side, it is said to be positively skewed. If the inverse is true, it is said to be negatively skewed (Antonius, 2013). Kurtosis is the numerical measure of the degree to which the distribution of data is peaked or flat in relation to a normal distribution (Antonius, 2013; Rasch, et al., 2012). The descriptive statistics for the above-mentioned concepts are reported in Table 6.2.

Table 6.2
Measures of central tendency and standard deviations

Measuring Instrument	Median	Mean	SD	Range of Scores	Skewness	Kurtosis
C-DAS	112	102.47	22.60	24-120	-1.84	3.09
PAS-M	117	112.12	15.85	19-126	-2.56	8.67
OPRS-M	54	50.39	10.23	15-60	-1.60	2.24
LAPS	86	81.05	12.68	24-92	-2.03	4.47

Note: SD = Standard Deviation; C-DAS = Coleman Dog Attitude Scale; PAS-M = Pet Attitude Scale Modified; OPRS-M = Owner – Pet Relationship Scale – Modified; LAPS = Lexington Attachment to Pets Scale.

6.4 FACTOR ANALYSIS

Factor analysis is a technique used to reduce data. It is also used in order to analyse the interrelationship of variables. Factor analysis aims to determine the underlying structure or dimensions of a set of variables (Acton & Miler, 2009; Brace et al., 2015; Foxcroft & Roodt, 2013; Rasch, et al., 2012). By identifying the different factors of a measuring instrument, it aides in identifying its subscales. It is also used as an indicator of factorial validity which is normally used as an indication of the validity of a measuring instrument when an existing measuring instrument is used in a different context to that within which it was originally developed and validated (Foxcroft & Roodt, 2013). When conducting the factor analysis, the factor loading of each item is calculated. This enables us to see which variable can be explained by which factor. Exploratory factor analysis (EFA) was conducted on all four of the measuring instruments. Confirmatory factor analysis (CFA) is a way to test how well a smaller set of

constructs is represented by the variables. CFA was also run on all the measures and the following tables indicate the results obtained from the EFA and the CFA respectively.

6.5. EXPLORATORY FACTOR ANALYSIS

Exploratory factor analysis (EFA) was conducted on all four of the measuring instruments. The below tables relay the results obtained. The results will be discussed in Chapter 7. In order to clearly see the different factors, a scree plot is also shown for each of the measuring instruments. The factor loading for a sample consisting of 300 participants has to be above .298 and the factor loading for a sample size of 600 has to be above .210 (Field, 2013). The scree plot for each measure follows directly below each of the relevant tables. The results of the exploratory factor analysis with a varimax rotation for the C-DAS is reported in Table 6.3.

6.5.1 Exploratory factor analysis for the C-DAS

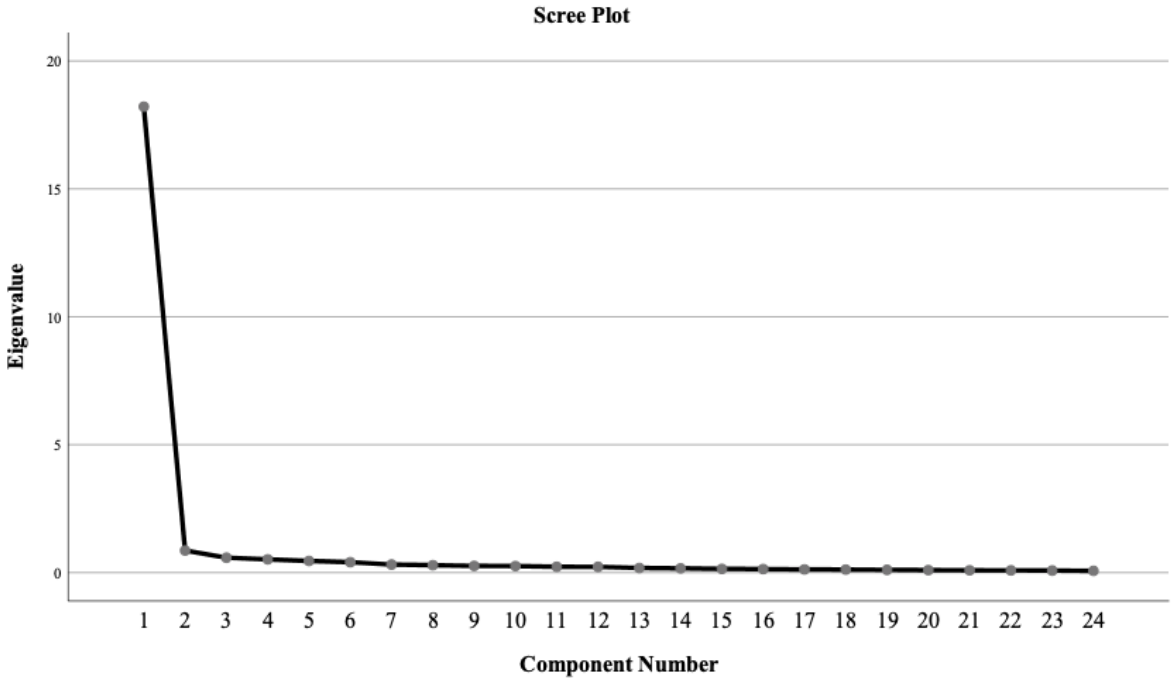
Table 6.3
C-DAS Exploratory Factor Analysis Varimax Rotation Factor Loadings

		Component
	Variable	1
1.	When I see a dog I want to play with it	.799
2.	I love dogs	.932
3.	I like to walk dogs	.709
4.	I enjoy having a dog as a pet, or would if I had one	.925
5.	When I see a dog I smile	.907
6.	Dogs comfort me	.931
7.	I like to pet dogs	.935
8.	Dogs make me feel loved	.916
9.	I like to play with dogs	.927
10.	I wanted to have a dog when I was a child	.803
11.	I think dogs are cute	.808
12.	Dogs make me happy	.930
13.	I avoid dogs*	.759
14.	I think dogs are fun	.920
15.	Dogs calm me down	.884
16.	I would like to live with a dog	.885
17.	Dogs reduce my stress	.909
18.	Interacting with dogs makes me feel excited	.878
19.	I talk to dogs	.837
20.	I like being around dogs	.938
21.	I will share my bed with my dog, or would if I had one	.623
22.	I think dogs are adorable	.897
23.	I like to cuddle with dogs	.917
24.	I hate dogs*	.779

Note:* Indicates items are reverse-scored, Extraction Method: Principal Component Analysis. 1 components extracted; C- DAS = Coleman Dog Attitude Scale.

In Figure 1 the scree plot the factor distribution of the exploratory factor analysis of the C-DAS with a Varimax Rotation is reported.

Figure 1
C-DAS Exploratory Factor Analysis Varimax Rotation Scree Plot



Bartlett's test of sphericity is a test used to identify whether a correlation matrix of variables differs significantly from an identity matrix. The Kaiser-Meyer-Olkin measure of sampling adequacy is an index in factor analysis that indicates how effectively the variables can be grouped into a smaller amount of variables. The minimum value of the KMO is 1.0. The larger the value, the better chance you have of conducting a successful factor analysis. The KMO should be bigger than .60 (Acton & Miller, 2009). The results of the KMO and Bartlett's test of sphericity for the C-DAS are reported in Table 6.4.

Table 6.4
KMO and Bartlett's test of sphericity for the CDAS

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.983
Bartlett's Test of Sphericity	Approx. Chi Square	18153.811
	df	276
	Sig.	.000

Note: KMO = Kaiser-Meyer-Olkin Measure of Sampling Adequacy; df = Degrees of freedom; Sig. = Significance level; C-DAS = Coleman Dog Attitude Scale.

6.5.2 Exploratory factor analysis for the PAS-M

The results of the exploratory factor analysis with a varimax rotation for the PAS-M is reported in Table 6.5.

Table 6.5
PAS-M Exploratory Factor Analysis Varimax Rotation Factor Loadings

		Component		
	Variable	1	2	3
1.	I really like seeing pets enjoy their food	.613	.416	-.013
2.	My pet means more to me than any of my friends, or would if I had one	.765	.031	.179
3.	I would like to have a pet in my home	.619	.601	.140
4.	Having pets is a waste of money*	.219	.758	.289
5.	House pets add happiness to my life (or would if I had one)	.619	.605	.080
6.	I feel that pets should always be kept outside*	.424	.327	.481
7.	I spend time everyday playing with my pet (or would if I had one)	.648	.475	.199
8.	I have occasionally communicated with my pet and understood what it was trying to express (or would if I had one)	.732	.254	.120
9.	The world would be a better place if people would stop spending so much time caring for their pets and started caring more for other human beings instead*	115	.382	.530
10.	I like to feed animals out of my hand	.746	.075	.113
11.	I love pets	.544	.651	.075
12.	Animals belong in the wild or in zoos, but not in the home*	.084	.347	.575
13.	If you keep pets in the house you can expect a lot of damage to furniture*	.148	-.112	.800
14.	I like house pets	.665	.487	.267
15.	Pets are fun but it is not worth the trouble of owning one*	.206	.659	.188
16.	I frequently talk to my pets (or would if I had one)	.618	.478	.191
17.	I hate animals*	.177	.716	.078
18.	You should treat your house pets with as much respect as you would a human member of your family	.693	.285	.184

Note:* Indicates items are reversed scored, Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 6 iterations; PAS-M = Pet Attitude Scale Modified.

In Figure 2 the scree plot for the exploratory factor analysis with a varimax rotation for the PAS-M is reported.

Figure 2
PAS-M Exploratory Factor Analysis Varimax Rotation Scree Plot

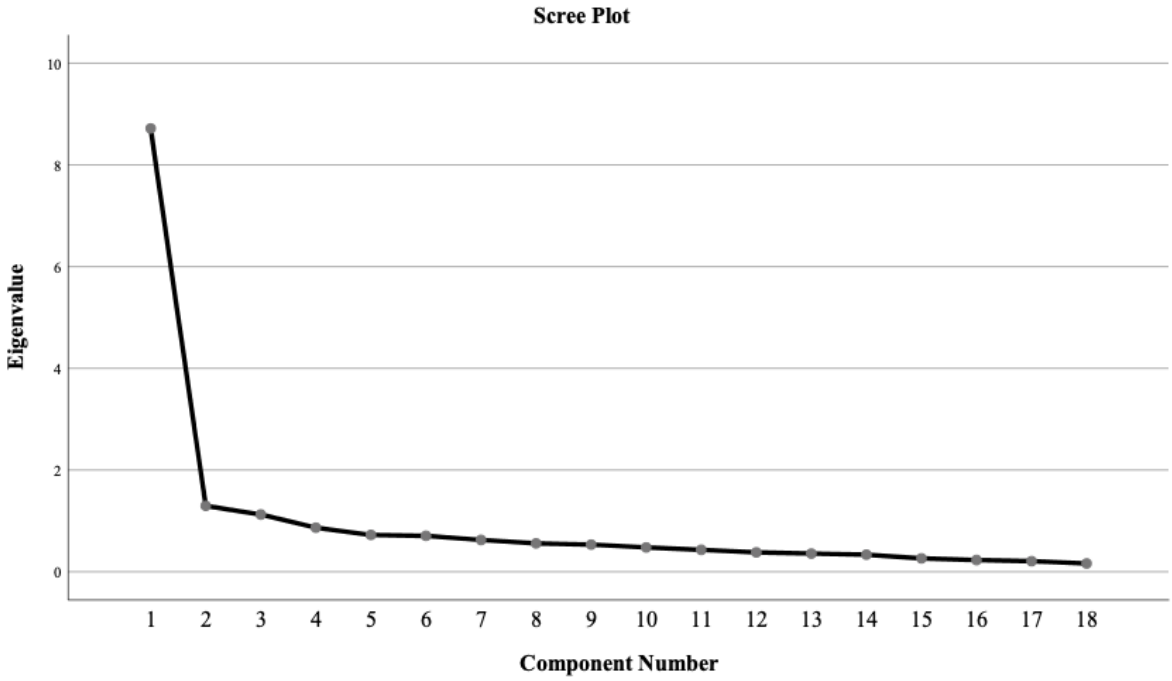


Table 6.6 reports the results of the KMO and Bartlett's test of sphericity for the PAS-M.

Table 6.6
KMO and Bartlett's test of sphericity for the PAS-M

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.952
Bartlett's Test of Sphericity	Approx. Chi Square	5694.391
	df	153
	Sig.	.000

Note: KMO = Kaiser-Meyer-Olkin Measure of Sampling Adequacy; df = Degrees of freedom; Sig. = Significance level; PAS-M = Pet Attitude Scale Modified.

6.5.3 Exploratory factor analysis for the OPRS-M

The results of the exploratory factor analysis with a varimax rotation for the OPRS-M is reported in Table 6.7.

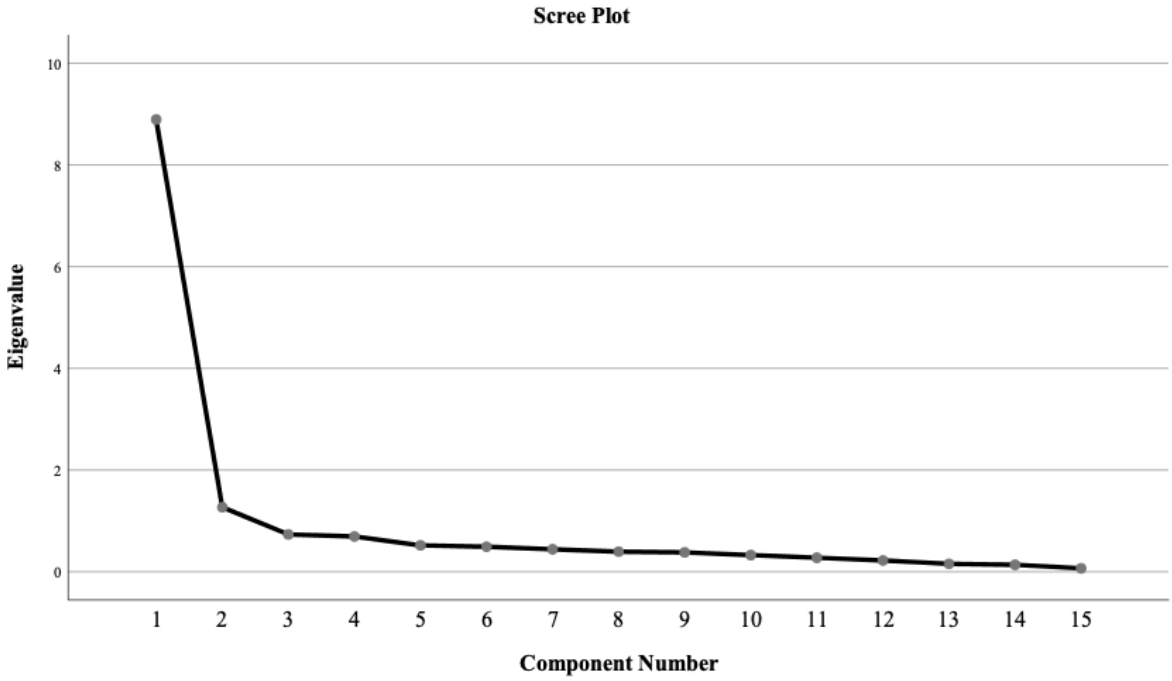
Table 6.7
OPRS-M Exploratory Factor Analysis Varimax Rotation Factor Loadings

		Component	
	Variable	1	2
1.	My dog enjoys my company	.272	.901
2.	My dog is a member of my family	.468	.802
3.	I love my dog	.352	.897
4.	My dog helps me get through rough times	.650	.618
5.	My dog relies on me for love and care	.274	.859
6.	I have got to know other people through having this dog	.626	.206
7.	My dog gives me a reason to get up in the morning	.802	.274
8.	I think about my pet when it is not with me	.757	.239
9.	I do not like leaving my dog in someone else's care when I travel	.665	.297
10.	My dog is more loyal to me than the people in my life	.707	.309
11.	I want to take my dog along when I go to visit friends or relatives	.761	.264
12.	My dog knows when I am upset and tries to comfort me	.619	.565
13.	My feelings towards other people are affected by how they react to my dog	.646	.470
14.	Dogs should have the same rights and privileges as family members	.682	.381
15.	I have a photo of my dog in my a) purse or wallet, b) cell phone, or c) on display in my office or home	.535	.272

Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in three iterations; OPRS-M = Owner-Pet Relationship Scale – Modified.

In Figure 3 the scree plot for the exploratory factor analysis with a varimax rotation for the OPRS-M is reported.

Figure 3
OPRS-M Exploratory Factor Analysis Varimax Rotation Scree Plot



In Table 6.8 the Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of sphericity for the OPRS-M is reported.

Table 6.8
KMO and Bartlett's test of sphericity for the OPRS-M

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.952
Bartlett's Test of Sphericity	Approx. Chi Square	6751.968
	df	105
	Sig.	.000

Note: KMO = Kaiser-Meyer-Olkin Measure of Sampling Adequacy; df = Degrees of freedom; Sig. = Significance level; OPRS-M = Owner-Pet Relationship Scale-Modified.

6.5.4 Exploratory factor analysis for the LAPS

The results of the exploratory factor analysis with a varimax rotation for the LAPS is reported in Table 6.9.

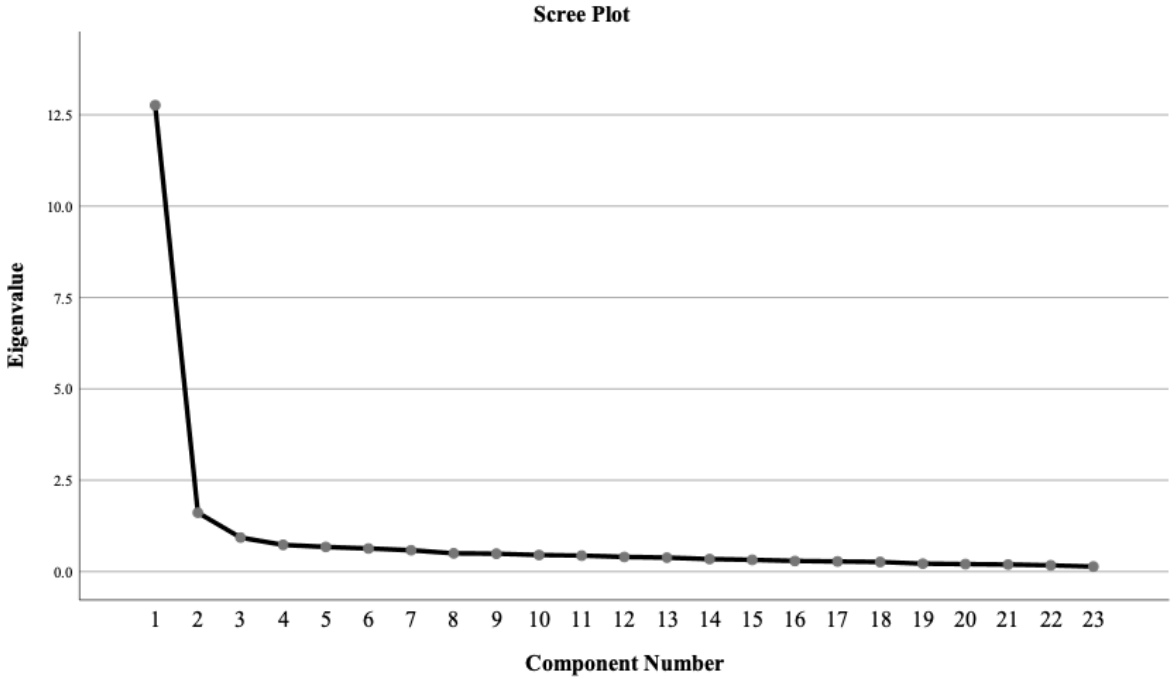
Table 6.9
LAPS Exploratory Factor Analysis Varimax Rotation Factor Loadings

		Components	
	Variable	1	2
1.	My pet means more to me than any of my friends	.293	.689
2.	Quite often I confide in my pet	.209	.686
3.	I believe pets should have the same rights and privileges as family members	.370	.673
4.	I believe my pet is my best friend	.320	.718
5.	Quite often my feelings towards other people are affected by the way they react to my pet	.427	.611
6.	I love my pet because he/she is more loyal to me than most people in my life	.233	.792
7.	I enjoy showing other people pictures of my pet	.403	.609
8.	I think my pet is just a pet*	.503	.446
9.	I love my pet because it never judges me	.146	.685
10.	My pet knows when I am feeling bad	.420	.611
11.	I often talk to other people about my pet	.477	.564
12.	My pet understands me	.310	.745
13.	I believe that loving my pet helps me stay healthy	.602	.442
14.	Pets deserve as much respect as humans do	.616	.474
15.	My pet and I have a very close relationship	.710	.517
16.	I would do almost anything to take care of my pet	.636	.495
17.	I play with my pet quite often	.773	.267
18.	I consider my pet to be great companion	.763	.453
19.	My pet makes me happy	.826	.329
20.	I feel that my pet is a part of my family	.814	.292
21.	I am not very attached to my pet*	.776	.088
22.	Owning a pet adds to my happiness	.823	.346
23.	I consider my pet to be a friend	.591	.543

Note:* Indicates items are reversed scored, Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in three iterations; LAPS = Lexington Attachment to Pets Scale.

In Figure 4 the scree plot for the exploratory factor analysis with a varimax rotation for the LAPS is reported.

Figure 4
LAPS Exploratory Factor Analysis Varimax Rotation Scree Plot



In Table 6.10 the Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of sphericity for the LAPS is reported.

Table 6.10
KMO and Bartlett's test of sphericity for the LAPS

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.965
Bartlett's Test of Sphericity	Approx. Chi Square	9587.662
	df	253
	Sig.	.000

Note: KMO = Kaiser-Meyer-Olkin Measure of Sampling Adequacy; df = Degrees of freedom; Sig. = Significance level; LAPS = Lexington Attachment to Pets Scale

6.6 CONFIRMATORY FACTOR ANALYSIS

All four of the measures had Confirmatory factor analysis (CFA) conducted on them. The results obtained from the data is reported in Table 6.11. The results will be discussed in Chapter 7.

Table 6.11
Goodness of fit indices for confirmatory factor analyses of all the measuring instruments

Measuring Instrument	χ^2	df	*p*	CFI	RMSEA	GFI	AGFI	PGFI
C-DAS	289.42	252	<0.0001	1.000	0.017	1.000	0.999	0.999
PAS-M	309.39	135	<0.0001	0.999	0.049	0.996	0.992	0.992
OPRS-M	214.44	90	<0.0001	0.999	0.051	0.998	0.997	0.997
LAPS	629.03	230	<0.0001	0.996	0.057	0.995	0.993	0.993

Note: χ^2 = Chi Square; df = Degrees of freedom; *p* = *p* value; CFI = comparative fit index; RMSEA = root mean square error of approximation; GFI = goodness of fit index; AGFI = adjusted goodness of fit index; PGFI = parsimony goodness of fit index; C-DAS = Coleman Dog Attitude Scale; PAS-M = Pet Attitude Scale–Modified; OPRS-M = Owner-Pet Relationship Scale–Modified; PAS-M = Pet Attachment Scale Modified.

6.7 CORRELATIONS

In order to evaluate the validity of the C-DAS and the OPRS-M when used in South Africa, the C-DAS was correlated with the PAS-M and the OPRS-M was correlated with the LAPS. In Table 6.12 the correlations obtained when all four measures are entered into SPSS 25 are reported.

Table 6.12
Correlations of all four measures

		C-DAS	PAS-M	OPRS-M	LAPS
C-DAS	Pearson Correlation	1	.578**	.605**	.386**
	Sig. (2-tailed)		.000	.000	.000
	N	535	535	535	535
PAS-M	Pearson Correlation	.578**	1	.628**	.614**
	Sig. (2-tailed)	.000		.000	.000
	N	535	535	535	535
OPRS-M	Pearson Correlation	.605**	.628**	1	.613**
	Sig. (2-tailed)	.000	.000		.000
	N	535	535	535	535
LAPS	Pearson Correlation	.386**	.614**	.613**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	535	535	535	535

Note:** Correlation significant at the 0.01 level (2-tailed). C-DAS = Coleman Dog Attitude Scale; PAS-M = Pet Attitude Scale – Modified; OPRS-M = Owner-Pet relationship Scale; LAPS = Lexington Attachment to Pets Scale.

Since this study aimed to prove the validity of the C-DAS in the South African context it was correlated with the PAS-M. In Table 6.13 the results obtained by running correlations in SPSS 25 is reported.

Table 6.13
Correlations of the C-DAS with the PAS-M

		C-DAS	PAS-M
C-DAS	Pearson Correlation	1	.578**
	Sig. (2-tailed)		.000
	N	535	535
PAS-M	Pearson Correlation	.578**	1
	Sig. (2-tailed)	.000	
	N	535	535

Note:** Correlation significant at the 0.01 level (2-tailed);
C-DAS = Coleman Dog Attitude Scale; PAS-M = Pet Attitude Scale – Modified.

This study aimed to prove the validity of the OPRS-M when used in South Africa and it was correlated with the LAPS. In Table 6.14 the results obtained by running correlations in SPSS 25 is reported.

Table 6.14
Correlations of the OPRS-M with the LAPS

		OPRS-M	LAPS
OPRS-M	Pearson Correlation	1	.613**
	Sig. (2-tailed)		.000
	N	535	535
LAPS	Pearson Correlation	.613**	1
	Sig. (2-tailed)	.000	
	N	535	535

Note:** Correlation significant at the 0.01 level (2-tailed);
OPRS-M = Owner-Pet Relationship Scale-Modified;
LAPS= Lexington Attachment to Pets Scale

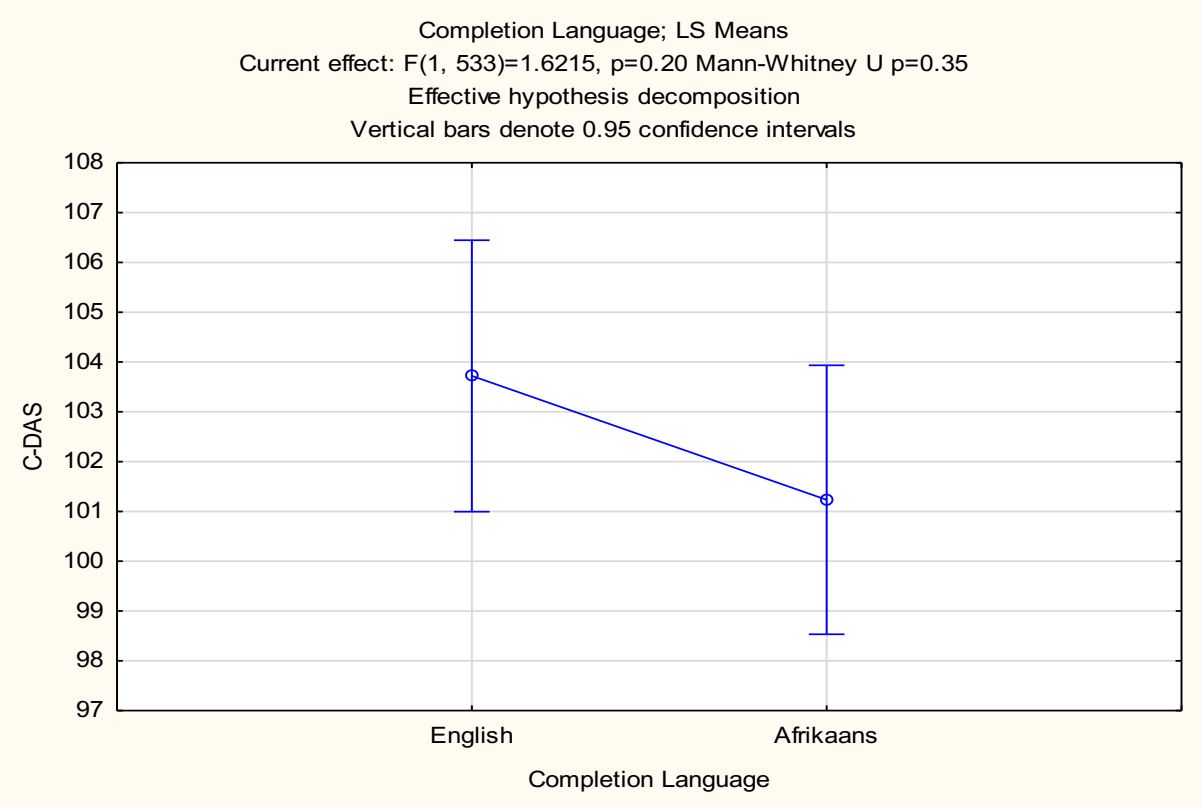
6.8 ANOVA RESULTS OF THE COMPLETION LANGUAGE AND GENDER

Analysis of variance (ANOVA) is an inferential statistical test that determines whether the levels of a variable differ significantly across the categories of another variable (Acton & Miller, 2009; Brace et al., 2015). In order to explore differences based on gender and language for each of the measures, ANOVA was done. F-ratio is the statistic obtained when conducting ANOVA calculations (Brace et al., 2015). Mann-Whitney is an inferential statistical test (Brace et al., 2015) that was used in the present study to analyse the data relating to the language and gender of the participants. Cohen's D was used to measure effect size.

6.8.1 Completion language of the C-DAS

In Figure 5 the results for the C-DAS completion language comparison between English and Afrikaans participants is reported.

Figure 5
Completion Language F-test of the C-DAS



In Table 6.15 the descriptive statistics for the completion language F-test of the C-DAS is reported.

Table 6.15
Completion language descriptive statistics for the C-DAS

Effect	Level of factor	N	C-DAS Mean	C-DAS Std. Dev
Total		535	102.47	22.60
Completion language	English	265	103.72	21.09
Completion language	Afrikaans	270	101.23	23.97

Note: N = Number of participants; C-DAS= Coleman Dog Attitude Scale.

In Table 6.16 the Cohen's D for the completion language F-test of the C-DAS is reported.

Table 6.16
Completion language Cohen's D for the C-DAS

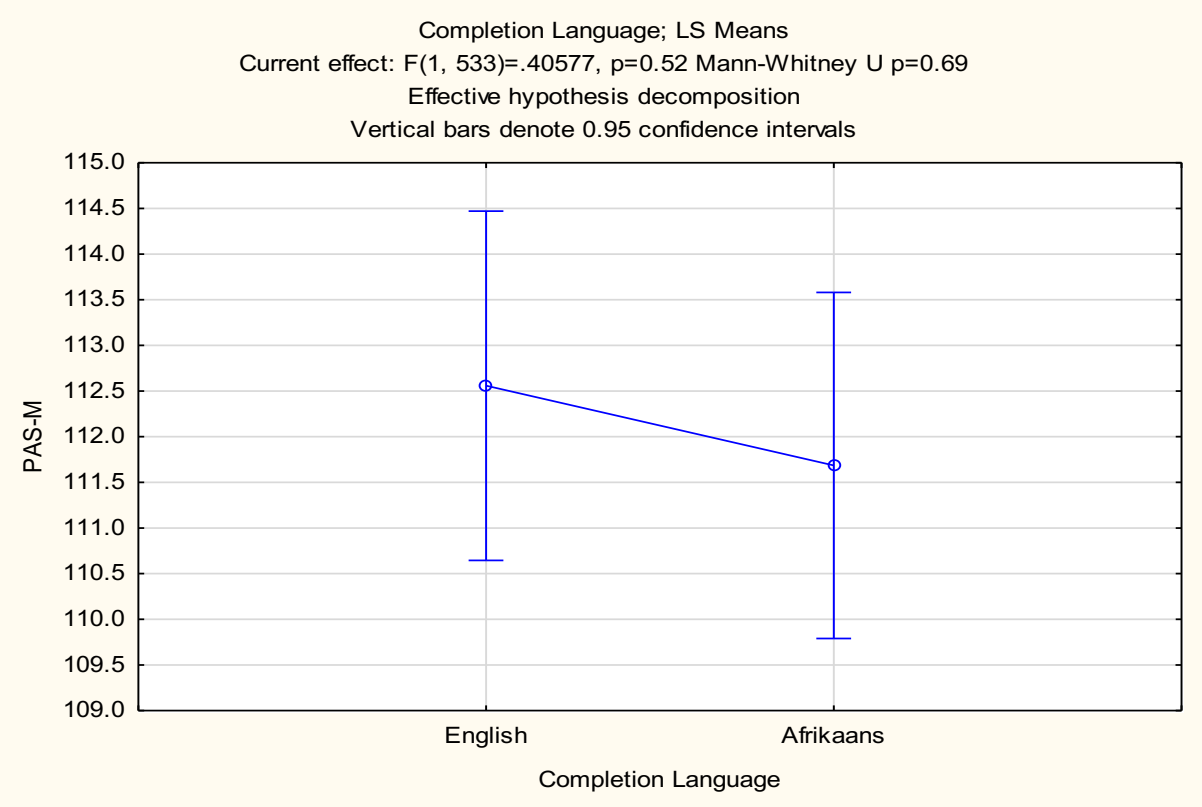
	Completion Language	(1)	(2)
1	English		0.11 (negligible)
2	Afrikaans	0.11 (negligible)	

Note: C-DAS= Coleman Dog Attitude Scale.

6.8.2 Completion language of the PAS-M

In Figure 6 the results for the PAS-M completion language comparison between English and Afrikaans participants is reported.

Figure 6
Completion Language F-test of the PAS-M



In Table 6.17 the descriptive statistics for the completion language F-test of the PAS-M is reported.

Table 6.17
Completion language descriptive statistics for the PAS-M

Effect	Level of factor	N	PAS-M Mean	PAS-M Std. Dev
Total		535	112.12	15.85
Completion language	English	265	112.56	15.06
Completion language	Afrikaans	270	111.69	16.60

Note: N = Number of participants; PAS-M= Pet Attitude Scale Modified.

In Table 6.18 the Cohen's D for the completion language F-test of the PAS-M is reported.

Table 6.18
Completion language Cohen's D for the PAS-M

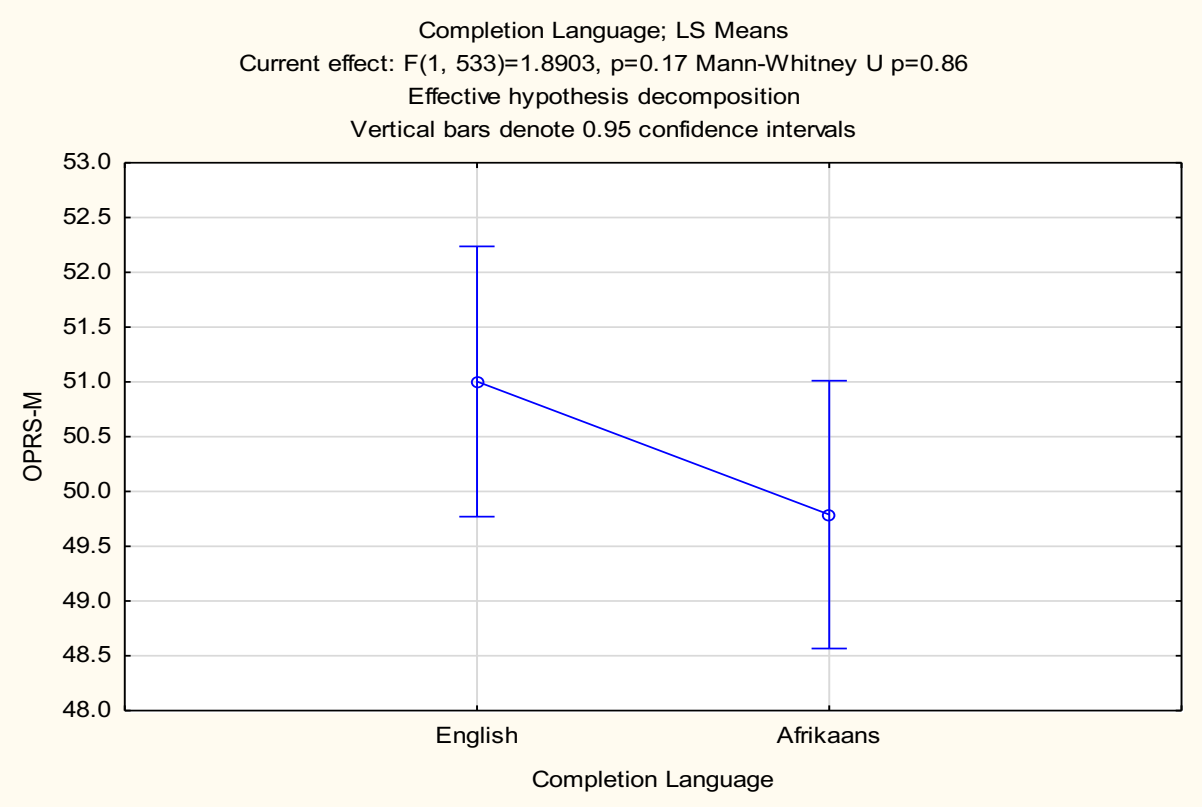
	Completion Language	(1)	(2)
1	English		0.06 (negligible)
2	Afrikaans	0.06 (negligible)	

Note: PAS-M = Pet Attitude Scale Modified

6.8.3 Completion language of the OPRS-M

In Figure 7 the results for the OPRS-M completion language comparison between English and Afrikaans participants is reported.

Figure 7
Completion Language F-test of the OPRS-M



In Table 6.19 the descriptive statistics for the completion language F-test of the OPRS-M is reported.

Table 6.19
Completion language descriptive statistics for the OPRS-M

Effect	Level of factor	N	OPRS-M Mean	OPRS-M Std. Dev
Total		535	50.39	10.23
Completion language	English	265	51	9.28
Completion language	Afrikaans	270	49.79	11.07

Note: N = Number of participants; OPRS-M= Owner-Pet Relationship Scale Modified.

In Table 6.20 the Cohen's D for the completion language F-test of the OPRS-M is reported.

Table 6.20
Completion language Cohen's D for the OPRS-M

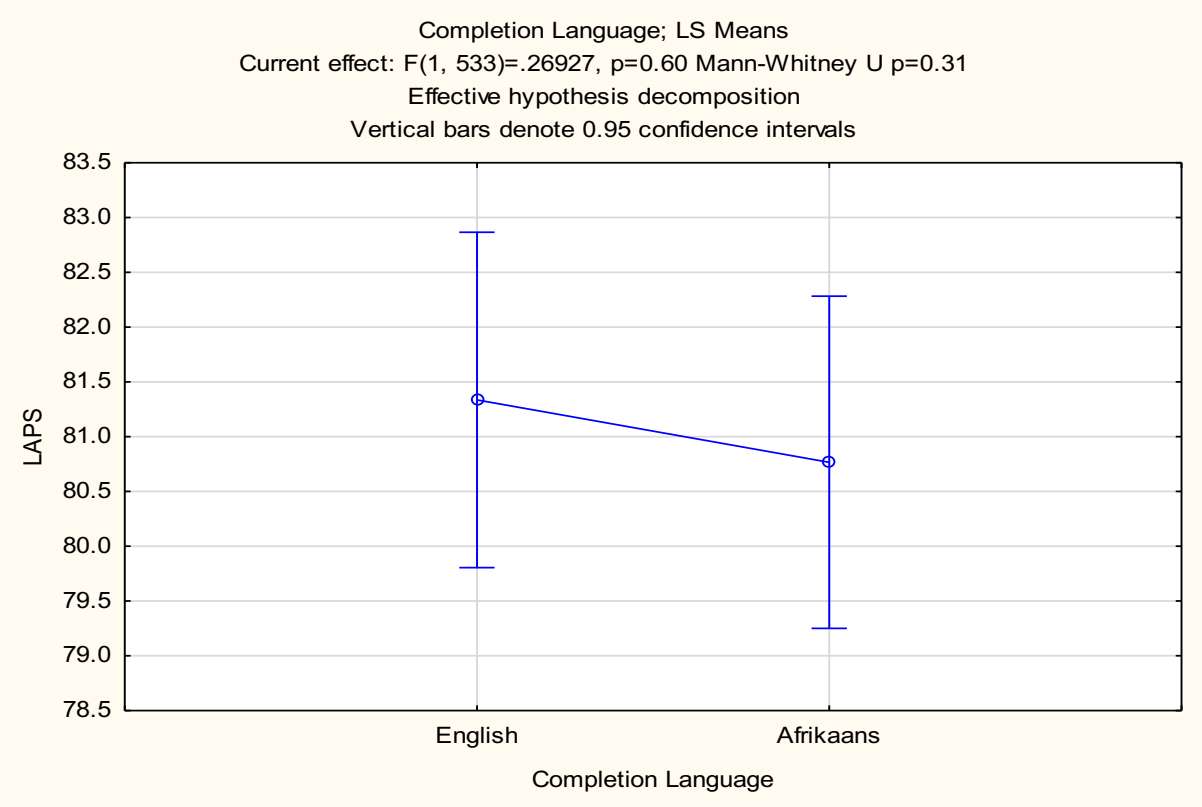
	Completion Language	(1)	(2)
1	English		0.12 (negligible)
2	Afrikaans	0.12(negligible)	

Note: OPRS-M = Owner – Pet Relationship Scale – Modified.

6.8.4 Completion language of the LAPS

In Figure 8 the results for the LAPS completion language comparison between English and Afrikaans participants is reported.

Figure 8
Completion Language F-test of the LAPS



In Table 6.21 the descriptive statistics for the completion language F-test of the LAPS is reported.

Table 6.21
Completion language descriptive statistics for the LAPS

Effect	Level of factor	N	LAPS Mean	LAPS Std. Dev
Total		535	81.05	12.68
Completion language	English	265	81.34	11.66
Completion language	Afrikaans	270	80.77	13.62

Note: N = Number of participants; LAPS= Lexington Attachment to Pets Scale.

In Table 6.22 the Cohen's D for the completion language F-test of the LAPS is reported.

Table 6.22
Completion language Cohen's D for the LAPS

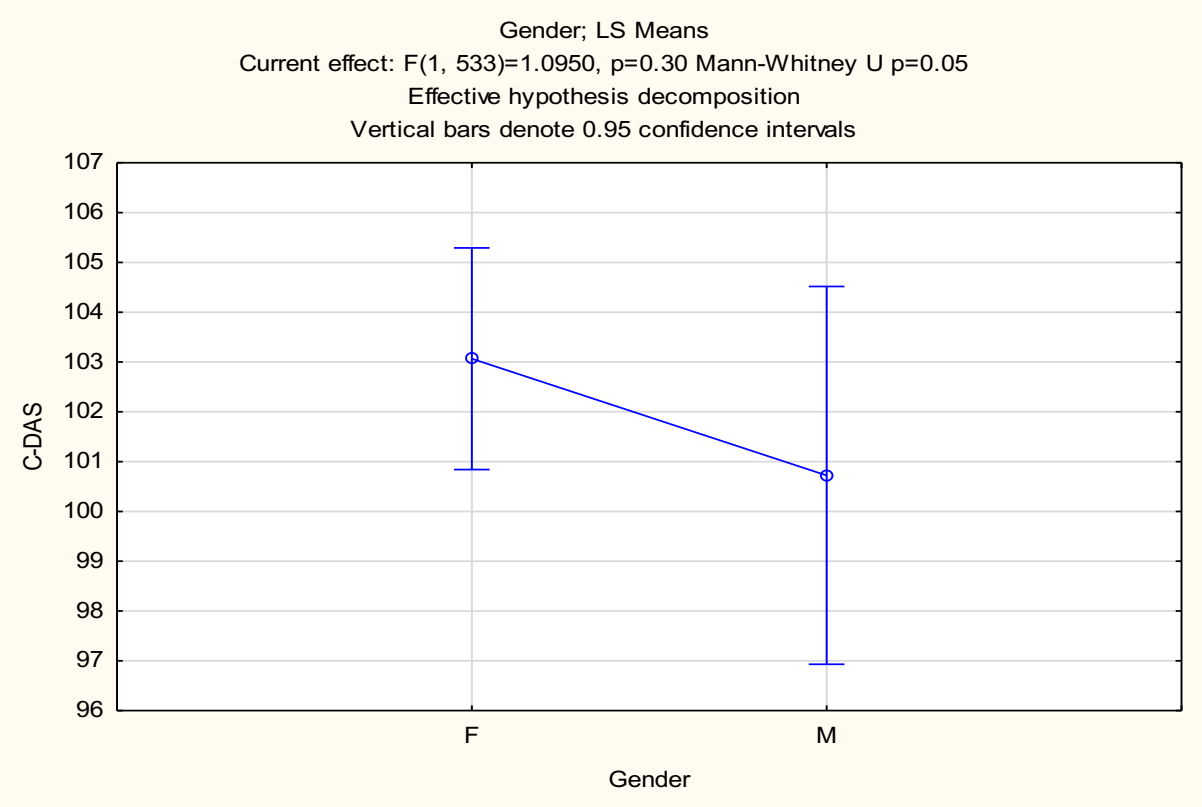
	Completion Language	(1)	(2)
1	English		0.04(negligible)
2	Afrikaans	0.04(negligible)	

Note: Lexington Attachment to Pets Scale

6.8.5 Gender differences of the C-DAS

In Figure 9 the results for the C-DAS gender comparison between female and male participants is reported.

Figure 9
Gender differences F-test of the C-DAS



In Table 6.23 the descriptive statistics for the gender differences F-test of the C-DAS is reported.

Table 6.23
Gender differences descriptive statistics for the C-DAS

Effect	Level of factor	N	C-DAS Mean	C-DAS Std. Dev
Total		535	102.47	22.60
Gender	Female	398	103.07	23.09
Gender	Male	137	100.72	21.10

Note: N = Number of participants; C-DAS= Coleman Dog Attitude Scale.

In Table 6.24 the Cohen's D for the gender differences F-test of the C-DAS is reported.

Table 6.24
Gender differences Cohen's D for the C-DAS

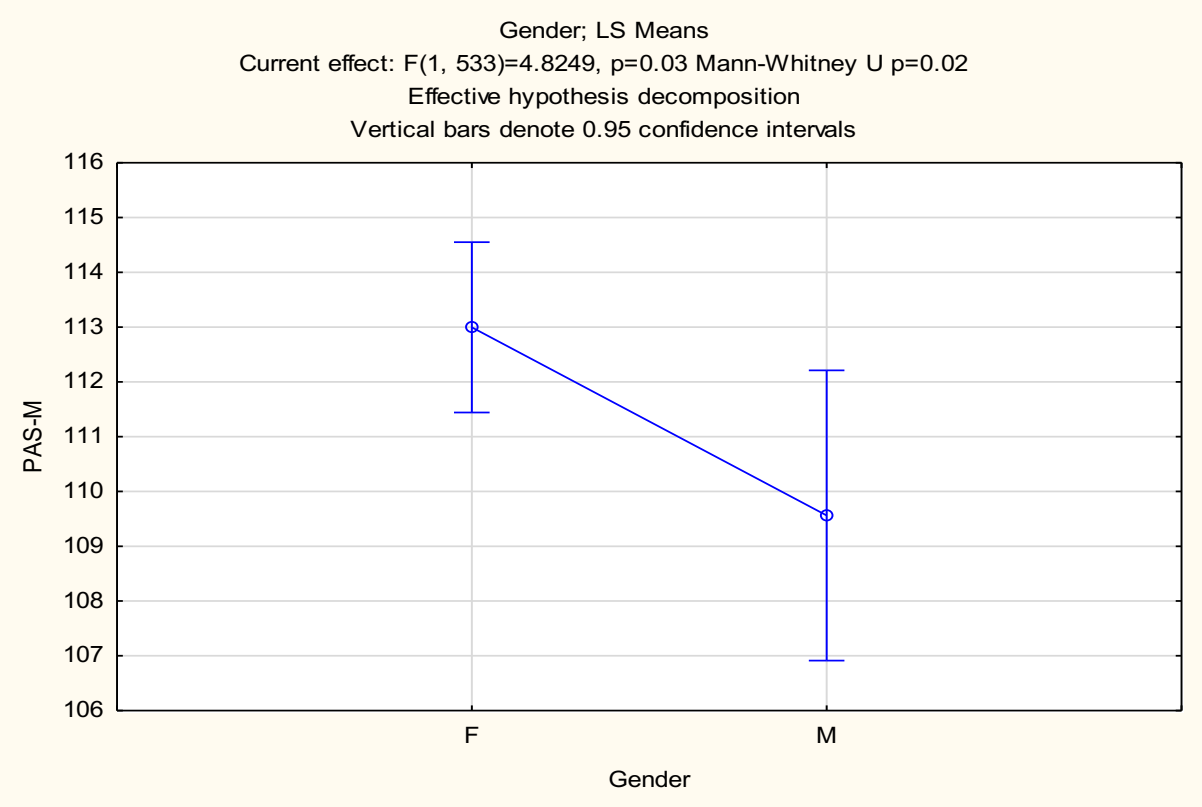
	Gender	(1)	(2)
1	Female		0.1 (negligible)
2	Male	0.1 (negligible)	

Note: C-DAS= Coleman Dog Attitude Scale.

6.8.6 Gender differences of the PAS-M

In Figure 10 the results for the PAS-M gender comparison between male and female participants is reported.

Figure 10
Gender differences F-test of the PAS-M



In Table 6.25 the descriptive statistics for the gender differences F-test of the PAS-M is reported.

Table 6.25
Gender differences descriptive statistics for the PAS-M

Effect	Level of factor	N	PAS-M Mean	PAS-M Std. Dev
Total		535	112.12	15.85
Gender	Female	398	113	15.74
Gender	Male	137	109.56	15.94

Note: N = Number of participants; PAS-M= Pet Attitude Scale Modified.

In Table 6.26 the Cohen's D for the gender differences F-test of the PAS-M is reported.

Table 6.26
Gender differences Cohen's D for the PAS-M

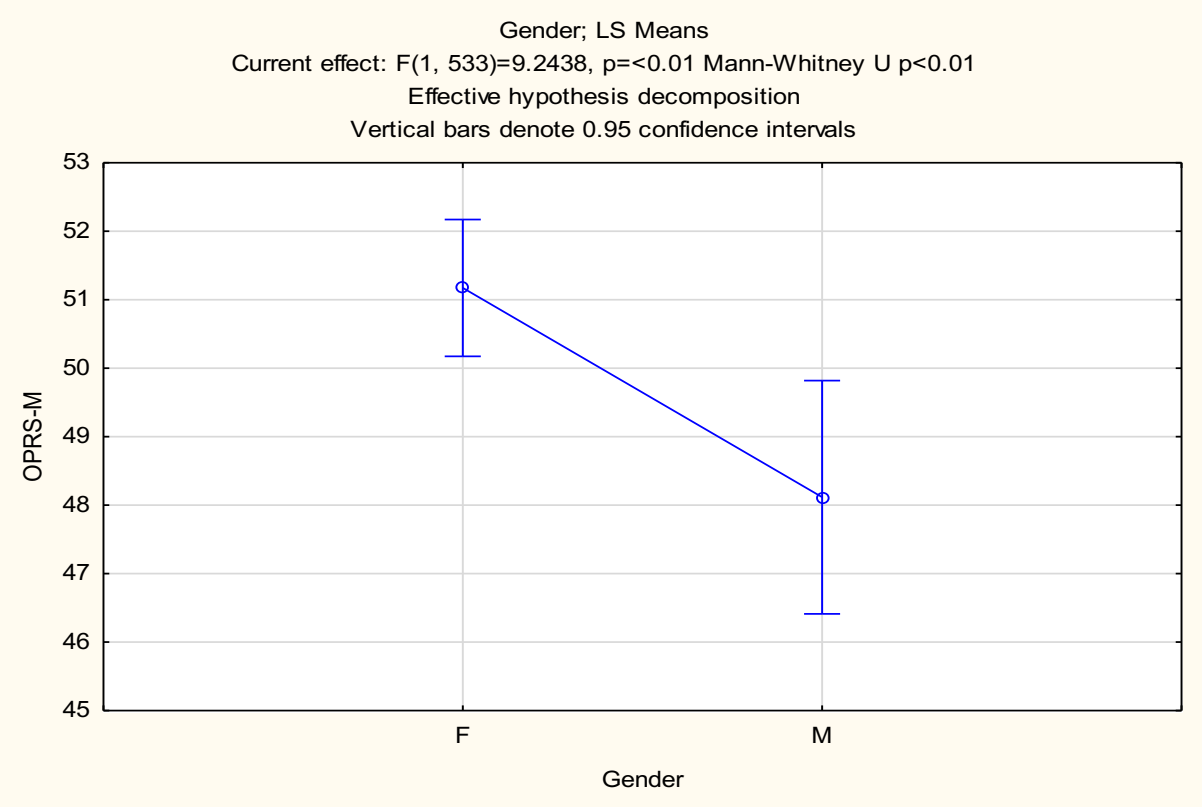
	Gender	(1)	(2)
1	Female		0.22 (small)
2	Male	0.22 (small)	

Note: PAS-M = Pet Attitude Scale Modified

6.8.7 Gender differences of the OPRS-M

In Figure 11 the results for the OPRS-M gender comparison between male and female participants is reported.

Figure 11
Gender differences F-test of the OPRS-M



In Table 6.27 the descriptive statistics for the gender differences F-test of the OPRS-M is reported.

Table 6.27
Gender differences descriptive statistics for the OPRS-M

Effect	Level of factor	N	OPRS-M Mean	OPRS-M Std. Dev
Total		535	50.39	10.23
Gender	Female	398	51.17	9.89
Gender	Male	137	48.12	10.88

Note: N = Number of participants; OPRS-M= Owner-Pet Relationship Scale Modified.

In Table 6.28 the Cohen's D for the gender differences F-test of the OPRS-M is reported.

Table 6.28
Gender differences Cohen's D for the OPRS-M

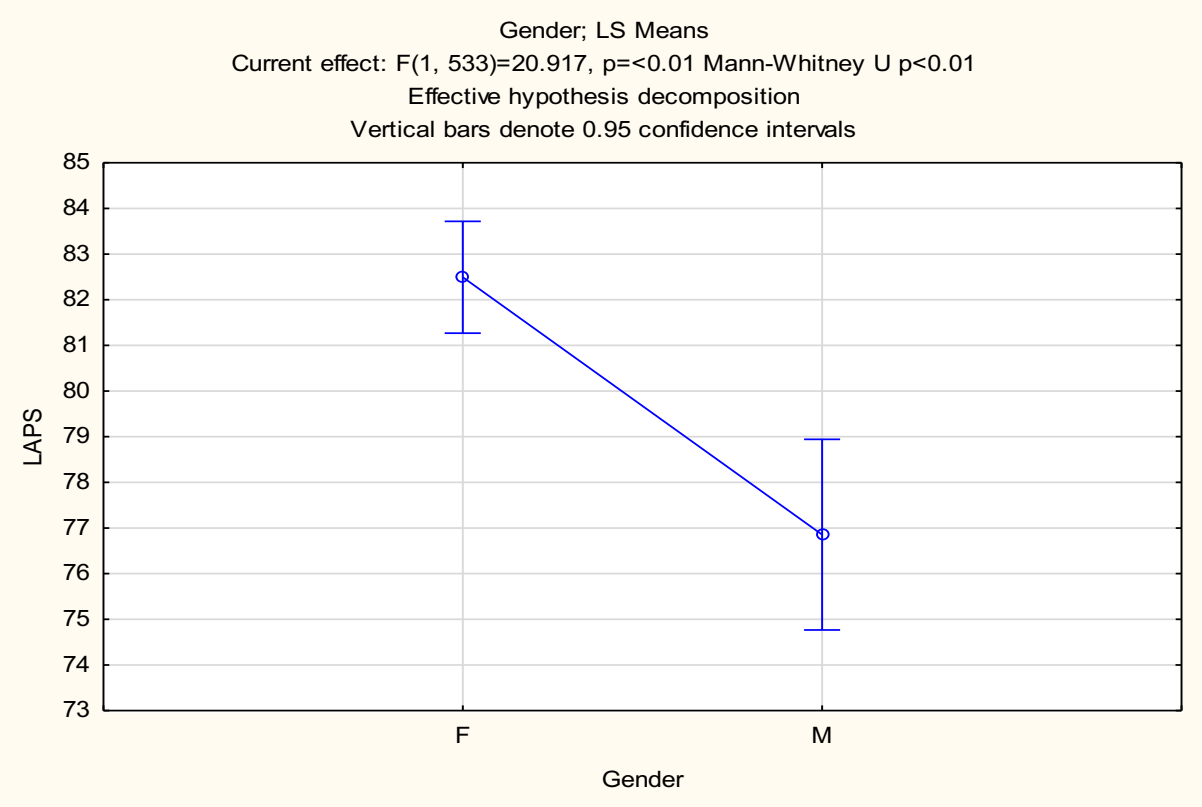
	Gender	(1)	(2)
1	Female		0.3 (small)
2	Male	0.3(small)	

Note: OPRS-M = Owner – Pet Relationship Scale – Modified.

6.8.8 Gender differences for the LAPS

In Figure 12 the results for the LAPS gender differences comparison between male and female participants is reported.

Figure 12
Gender differences F-test of the LAPS



In Table 6.29 the descriptive statistics for the gender differences F-test of the LAPS is reported.

Table 6.29
Gender differences descriptive statistics for the LAPS

Effect	Level of factor	N	LAPS Mean	LAPS Std. Dev
Total		535	81.05	12.68
Gender	Female	398	82.49	10.88
Gender	Male	137	76.85	16.17

Note: N = Number of participants; LAPS= Lexington Attachment to Pets Scale.

In Table 6.30 the Cohen's D for the gender differences F-test of the LAPS is reported.

Table 6.30
Gender differences Cohen's D for the LAPS

	Gender	(1)	(2)
1	Female		0.45(medium)
2	Male	0.45(medium)	

Note: Lexington Attachment to Pets Scale

6.9 CHAPTER SUMMARY

The results of the present study were reported in Chapter 6. The psychometric properties of each instrument were also displayed. The confirmatory factor analysis and exploratory factor analysis with factor loadings for all four of the measures were reported. Furthermore, the correlation between the C-DAS and the PAS-M as well as the correlation between the OPRS-M and the LAPS were reported. Lastly, the completion language and gender differences of all the participants were reported. In Chapter 7, these results will be discussed along with the limitations of this study and recommendations for future research.

CHAPTER 7

DISCUSSION

7.1 INTRODUCTION

The results of this study were reported in Chapter 6. The psychometric properties of each instrument were also displayed. The confirmatory factor analysis, exploratory factor analysis and factor loadings for all the measuring instruments were reported. The correlations of the C-DAS with the PAS-M and the OPRS-M with the LAPS were reported. The language and gender differences were also reported. In Chapter 7, these findings will be discussed. This chapter also includes a summary of the study as well as the limitations and recommendations for future research. The purpose of this study was to see if the C-DAS and the OPRS-M are valid and reliable measures to use in South Africa. The field of human-animal interaction is growing in popularity at a rapid pace (Coleman et al., 2016). This makes it necessary to have valid and reliable measures that measure aspects of HAI accurately.

7.2 THE C-DAS AND THE PAS-M

7.2.1 Introduction

The C-DAS was selected as one of the measures to explore in this study. In order to test its validity in the South African context, it was correlated with the PAS-M. In order to keep this discussion in an easy to read manner, it was decided to discuss the C-DAS and the PAS-M together. The Cronbach's alpha for all the measures were established and it was revealed that the C-DAS has a high internal reliability as its alpha in South Africa is .98, see Table 6.1 (p.67). Bryman (2008) states that the minimum acceptable level of internal reliability is usually .60, a level of .70 is satisfactory and a strong level of internal reliability is .80. Similar results were found in the pilot study, which had a reported Cronbach's alpha of .965. Coleman et al. found the C-DAS to have a Cronbach's alpha of .98. Consequently, this study found that the C-DAS

has the same Cronbach's alpha in South Africa as it has in its country of origin, the United States.

This study indicated that the PAS-M has high internal reliability. A Cronbach's alpha of .92 was established for the PAS-M in the South African context, see Table 6.1 (p.67). Coleman et al. found the PAS-M to have a Cronbach's alpha of 0.93. Similarly the pilot study reported a Cronbach's alpha of .87 for the PAS-M. Although the Cronbach's alpha for the PAS-M in the pilot study is not as high as the alpha found in this study or in Coleman et al., it is still considered as an acceptable level of internal reliability as it is higher than .80.

7.2.2 Exploratory factor analysis of the C-DAS

In this study, factor analysis was done by means of a principal component analysis with a varimax rotation. This was done in order to explore the different components that the measuring instruments consist of and to see if the same factor loadings were found as reported in Coleman et al. (2016) found that the C-DAS had a one-factor structure measuring attitudes towards dogs as the latent factor. The pilot study for this study found the C-DAS to have a two-factor structure, identifying the possible components as *positive attitudes towards dogs* and *companionship with dogs.*

The current study found the C-DAS to have a one-factor structure, with all the items loading onto one factor as can be seen in Table 6.3 (p. 69). According to Field (2013), a factor loading for a sample size of 300 should be above .298. The current sample size was 535 and the lowest factor loading was .623 indicating that all the items loaded onto one factor in a statistically significant way. This factor was identified as *positive attitude to dogs*. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.98, and Bartlett's test of sphericity was significant, χ^2 (276) = 18153.81, p<0.001, see Table 6.4 (p.70). A scree plot further identified one factor, see Figure 1 (p. 70).

7.2.3 Exploratory factor analysis of the PAS-M

The exploratory factor analysis for the PAS-M was also done by executing a principal component analysis with a varimax rotation. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.95, and Bartlett's test of sphericity was significant, χ^2 (153) = 5694.39, p<0.001.

The pilot study of this study found the PAS-M to have a four-factor structure with the first factor being *love and communication.* Items 11 and 16 loaded onto this factor and it accounted for 36.60% of the variance. The second factor was identified as *care and interaction*. Items loading onto this factor were items 1 and 7. The second factor accounted for 10.21% of the variance. Factor three was identified as *pets in the home.* Items that loaded onto this factor included items 6 and 14 and accounted for 7.48% of the variance. Factor four accounted for 6.12% of the variance and was identified as *dislike of companion animals*. The items loading onto this factor were the reversed scored items, item 9 and item 4.

The current study found the PAS-M to have a three-factor structure, see Table 6.5 (p.71). The first factor accounted for 48.43% of the total variance. This factor is assumed to be *love and interaction* and item 1, 2,3,5,7,8,10,14,16 and 18 loaded onto this factor in a statistically significant way. The second factor this study identified accounted for 7.2% of the variance and is assumed to be *joys of pet-ownership*. Items 4, 11, 15 and 17 loaded onto this factor more than they loaded on the other factors. Factor three is identified as *pets in the home.* It accounted for 6.2% of the total variance and items 6, 9, 12 and 13 loaded onto this factor higher than they loaded onto other factors. A scree plot provided further evidence for a three factor structure, see Figure 2 (p. 72). Munsel et al. found the same three-factor structure for the PAS-M and they also found the same subscales as identified in the current study.

In Table 7.1 the subscales and factor loadings found for the PAS-M are reported

Table 7.1
PAS-M subscales

Factor		Item	Loading
1 Love and interaction	1	I really like seeing pets enjoy their food	.613
	2	My pet means more to me than any of my friends, or would if I had one	.765
	3	I would like to have a pet in my home	. 619
	5	Housepets add happiness to my life (or would if I had one)	.619
	7	I spend time every day playing with my pet (or would if I had one)	.648
	8	I have occasionally communicated with my pet and understood what it was trying to express (or would if I had one)	.732
	10	I like to feed animals out of my hand	.746
	14	I like house pets	.665
	16	I frequently talk to my pets (or would if I had one)	.618
	18	You should treat your house pets with as much respect as you would a human member of your family	.693
2 Joys of pet ownership	4	Having pets is a waste of money*	.758
	11	I love pets	.651
	15	Pets are fun but it is not worth the trouble of owning one*	.659
	17	I hate animals*	.716
3 Pets in the home	6	I feel that pets should always be kept outside*	.481
	9	The world would be a better place if people would stop spending so much time caring for their pets and started caring more for other human beings instead*	.530
	12	Animals belong in the wild or in zoos, but not in the home*	.575
	13	If you keep pets in the house you can expect a lot of damage to furniture*	.800

Note:* Indicates items are reversed scored, Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 6 iterations; PAS-M = Pet Attitude Scale-Modified

7.2.4 Confirmatory factor analysis of the C-DAS

To determine overall model fit for the C-DAS, several model fit indices were examined: χ^2 , The comparative fit index (CFI), and the root mean square error of estimation (RMSEA), The Goodness of fit index (GFI), the Adjusted goodness of fit index (AGFI) and the parsimony goodness of fit index (PGFI). “The RMSEA is an index of the difference between the observed

covariance matrix per degree of freedom and the hypothesized covariance matrix" (Cangur & Ercan, 2015, p. 157) that underlies the model. A RMSEA index smaller than 0.06 is sufficient (Coleman et al., 2016). The CFI should be approximately 0.95 to suggest a good fit (Coleman et al.) This model provides adequate fit for the C-DAS with a one-factor structure, χ^2 (252) = 289.42, p=0.053, CFI= 1.000, RMSEA = 0.017 (0.000-0.025), GFI=1.000, AGFI=0.999, PGFI=0.999, see table 6.11 (p.77). All the items loaded onto one factor at .632 or higher.

7.2.5 Confirmatory factor analysis of the PAS-M

To determine overall model fit for the C-DAS, several model fit indices were examined: χ^2 , The comparative fit index (CFI), and the root mean square error of estimation (RMSEA), The Goodness of fit index (GFI), the Adjusted goodness of fit index (AGFI) and the parsimony goodness of fit index (PGFI). This model provides adequate fit for the PAS-M with a three-factor structure, χ^2 (135) = 309.39, p<0.0001, CFI= 0.999, RMSEA = 0.049 (0.042-0.056), GFI=0.996, AGFI=0.992, PGFI=0.992, see table 6.11 (p. 77).

7.2.6 Correlations between the C-DAS and the PAS-M

The C-DAS was correlated with the PAS-M using Pearson's correlation coefficient (r), its value ranges from -1 to + 1, 0 indicates that there is no relationship between the variables and a negative correlation signifies an inverse relationship and a positive correlation signifies a direct relationship. However, it is important to note that if a correlation between two measuring instruments is 1, the measures are exactly the same (Foxcroft & Roodt, 2013). This was done to determine if the C-DAS measures attitude in South Africa as correlations can be an indication of construct validity (Coleman et al., 2016; Foxcroft & Roodt, 2013). Coleman et al. (2016) notes that a statistically significant correlation between the C-DAS and the PAS-M would offer support for the construct validity of the C-DAS as one can expect attitudes towards dogs to be related to attitudes towards pets. Furthermore, if a new measuring instrument correlates highly with an older one that measures the same construct it indicates that the new

measure assesses the same construct. Coleman et al. (2016) found a positive correlation between the C-DAS and the PAS-M with r = .68, unfortunately they do not report on their p value. Similarly, the pilot study of this study also found a positive correlation between the C-DAS and the PAS-M with r = .767, p =.000. The current study found a positive correlation between the C-DAS and the PAS-M with r = .578, p =.000, see Table 6.13 (p. 78). This indicates that the C-DAS is valid for measuring people's attitudes to dogs in South Africa.

7.2.7 Language and gender differences for the C-DAS

An ANOVA F-test demonstrated no statistically significant differences between English (M = 103.72, SD = 21.09) and Afrikaans (M = 101.23, SD = 23.97) speaking respondents on the total C-DAS $F(1, 533) = 1.625$, $p = .20$, see Table 6.15 and Figure 5 (p. 79). In addition, Cohen's D obtained for language was 0.11, indicating a negligible effect size, see Table 6.16 (p. 79). A similar result was obtained in the pilot study with an independent t-test also demonstrating no significant difference between English (M = 107.30, SD = 15.77) and Afrikaans (M = 103.60, SD = 14.61) speaking respondents. Furthermore, no statistically significant differences were found between females (M = 103.07, SD = 23.09) and males (M = 100.72, SD = 21.10) in the current study $F(1, 533) = 1.0950$, $p = .30$, see Table 6.23 and Figure 9 (p. 83). In addition, Cohen's D obtained for gender for the C-DAS was 0.1 indicating a negligible effect size, see Table 6.24 (p. 83). A similar result was found in the pilot study with regards to gender with no significant difference being found between females (M = 106.61, SD = 15.57) and males (M = 103.48, SD = 14.40) on the C-DAS, $t(100) = .753$, p = .343 (Smith, 2016). Thus, when used in South Africa, the C-DAS demonstrates no language or gender differences.

7.2.8 Language and gender differences for the PAS-M

An ANOVA F-test demonstrated no statistically significant difference between English (M = 112.56, SD = 15.06) and Afrikaans (M = 111.69, SD = 16.60) speaking respondents on the total PAS-M. $F(1, 533) = .40577, p = .52$, see Table 6.17 and Figure 6 (p. 80). This was further emphasised by Cohen's D obtained for language being 0.06 indicating a negligible effect size, see Table 6.18 (p. 80). Furthermore, no statistically significant differences were found between females (M = 113, SD = 15.74) and males (M = 109.56, SD = 15.94) in the current study $F(1, 533) = 4.8249, p = .03$, see Table 6.25 and Figure 10 (p. 84). In addition Cohen's D for gender for the PAS-M was 0.22 which indicates a statistically negligible significance, see Table 6.26 (p. 84). Thus, when used in South Africa, the PAS-M demonstrates no language differences and a very small gender difference.

7.3 THE OPRS-M AND THE LAPS

7.3.1 Introduction

The OPRS-M was selected as one of the measuring instruments to explore in this study. In order to test its validity in the South African context, it was correlated with the LAPS. In order to keep this discussion in an easy to read manner, it was decided to discuss the OPRS-M and the LAPS together. The Cronbach's alpha for all the measures were established and it was revealed that the OPRS-M has high internal reliability as its alpha in South Africa is .94, see Table 6.1 (p. 67). The minimum level of internal reliability is usually .60, a level of .70 is satisfactory and an strong level of internal reliability is .80 (Bryman, 2009). The OPRS-M in the South African context has high internal reliability. Similar results were found in the pilot study, which reported a Cronbach's alpha of .91 for the OPRS-M (Cloete, 2016). Andreassen et al. (2013) found the OPRS-M to have a Cronbach's alpha of .84 when used in a general population in Norway.

The current study indicated that the LAPS has high internal reliability with a Cronbach's alpha of .96 in a general population in South Africa, see Table 6.1 (p. 67). A Cronbach's alpha of .94 (Gerber, 2015) was established for the LAPS in a student population in South Africa. González Ramírez, del Carmen, Berumen and Hernández (2014) found the LAPS to have a Cronbach's alpha of 0.96 for a general population in Mexico.

7.3.2 Exploratory factor analysis of the OPRS-M

In this study, factor analysis was done by means of a principal component analysis with a varimax rotation. This was done in order to explore the different components that the measuring instruments consist of and to see if the same factor loadings were found as reported in Andreassen et al. The Kaiser-Meyer-Olkin measure of sampling adequacy for the OPRS-M in the current study was 0.95, and Bartlett's test of sphericity was significant, χ^2 (105) = 6751.97, p<0.001, see Table 6.8 (p. 74).

Andreassen et al. (2013) found that the OPRS-M had a one-factor structure measuring attachment to dogs as the only latent factor. The pilot study for this study found the OPRS-M to have a three-factor structure, identifying the possible components as *love, attachment* and *responsibility.* The current study found the OPRS-M to have a two-factor structure, with items 1, 2, 3, and 5 loading onto one factor and items 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15 loading onto another factor, as can be seen in Table 6.7 (p.73). According to Field (2013), a factor loading for a sample consisting of 300 participants has to be above .298. The current sample size was 535 and the lowest factor loading was .206 indicating that some items loaded onto one factor in a statistically significant way and some of the factors loaded onto another factor in a statistically meaningful way. The factors were identified as *support* and *love*. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.95, and Bartlett's test of sphericity was significant, χ^2 (105) = 6751.97, p<0.001, see Table 6.8 (p. 74). A scree plot further identified

two factors, see Figure 3 (p. 74). Factor 1 accounted for 59.28% of the variance for the total scale and the second factor accounted for 8.46% of the total variance.

The subscales of the OPRS-M and their factor loadings are reported in Table 7.2.

Table 7.2

OPRS-M subscales

Factor		Item	Loading
1 Love	1	My dog enjoys my company	.901
	2	My dog is a member of my family	.802
	3	I love my dog	.897
	5	My dog relies on me for love and care	.859
2 Support	4	My dog helps me get through rough times	.650
	6	I have got to know other people through having this dog	.626
	7	My dog gives me a reason to get up in the morning	.802
	8	I think about my pet when it is not with me	.757
	9	I do not like leaving my dog in someone else's care when I travel	.665
	10	My dog is more loyal to me than the people in my life	.707
	11	I want to take my dog along when I go to visit friends or relatives	.761
	12	My dog knows when I am upset and tries to comfort me	. 619
	13	My feelings towards other people are affected by how they react to my dog	.646
	14	Dogs should have the same rights and privileges as family members	.682
	15	I have a photo of my dog in my a) purse or wallet, b) cell phone, or c) on display in my office or home	.535

Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in three iterations; OPRS-M = Owner-Pet relationship Scale-Modified.

7.3.3 Exploratory factor analysis of the LAPS

The exploratory factor analysis for the LAPS was also done by executing a principal component analysis with a varimax rotation. Bartlett's test of sphericity was significant, χ^2 (253) = 9587.66, p<0.001 and The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.97, see Table 6.10 (p. 76). The pilot study of this study found the LAPS to have a three-factor structure with the first factor being *general attachment.* Items 10, 11, 12, 13, 15, 17, 18, 19, 21, 22 and 23 loaded onto this subscale. The second factor is *people substitution*. Items loading onto this factor were items 1, 2, 4, 5, 6, 7 and 9. The third factor is *animal rights/animal welfare.* The items that loaded onto this factor were items 3, 8, 14, 16 and 20 (Cloete, 2016).

The current study found the LAPS to have a two-factor structure, see Table 6.9 (p. 75). The first factor accounted for 55.48% of the total variance. Items 8, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22 and 23 loaded onto the first factor in a statistically significant way. This factor, in the South African context is assumed to be *general attachment*. Items 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, and 12 loaded onto the second factor in a statistically significant way. The second factor this study accounted for 7% of the total variance. The second factor in the South African context is identified as *people substitution* A scree plot provided further evidence for a two-factor structure, see Figure 4 (p. 76).

The subscales of the LAPS and their factor loadings are reported in Table 7.3.

Table 7.3
LAPS subscales

Factor		Item	Loading
1 General attachment	8	I think my pet is just a pet*	.503
	13	I believe that loving my pet helps me stay healthy	.602
	14	Pets deserve as much respect as humans do	.616
	15	My pet and I have a very close relationship	.710
	16	I would do almost anything to take care of my pet	.636
	17	I play with my pet quite often	.773
	18	I consider my pet to be a great companion	.763
	19	My pet makes me happy	.826
	20	I feel that my pet is a part of my family	.814
	21	I am not very attached to my pet*	.776
	22	Owning a pet adds to my happiness	.823
	23	I consider my pet to be a friend	.591
2 People substitution	1	My pet means more to me than any of my friends	.689
	2	Quite often I confide in my pet	.686
	3	I believe pets should have the same rights and privileges as family members	.673
	4	I believe my pet is my best friend	.718
	5	Quite often my feelings towards other people are affected by the way they react to my pet	.611
	6	I love my pet because he/she is more loyal to me than most people in my life	.792
	7	I enjoy showing other people pictures of my pet	.609
	9	I love my pet because it never judges me	.685
	10	My pet knows when I am feeling bad	.611
	11	I often talk to other people about my pet	.564
	12	My pet understands me	.745

Note:* Indicates items are reversed scored, Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in three iterations; LAPS = Lexington Attachment to Pets Scale

7.3.4 Confirmatory factor analysis of the OPRS-M

To determine overall model fit for the OPRS-M, several model fit indices were examined: χ^2, The comparative fit index (CFI), and the root mean square error of estimation (RMSEA), The Goodness of fit index (GFI), the Adjusted goodness of fit index (AGFI) and the parsimony goodness of fit index (PGFI). This model provides adequate fit for the OPRS-M with a two-factor structure, χ^2 (90) = 214.44, p<0.0001, CFI= 0.999, RMSEA = 0.051 (0.042-0.060), GFI=0.998, AGFI=0.997, PGFI=0.997, see Table 6.11 (p. 77).

7.3.5 Confirmatory factor analysis of the LAPS

To determine overall model fit for the LAPS, several model fit indices were examined: χ^2, The comparative fit index (CFI), and the root mean square error of estimation (RMSEA), The Goodness of fit index (GFI), the Adjusted goodness of fit index (AGFI) and the parsimony goodness of fit index (PGFI). This model provides adequate fit for the LAPS with a two-factor structure, χ^2 (230) = 629.03, p<0.0001, CFI= 0.996, RMSEA = 0.057 (0.052-0.062), GFI=0.995, AGFI=0.993, PGFI=0.993, see Table 6.11 (p. 77).

7.3.6 Correlations between the OPRS-M and the LAPS

The OPRS-M was correlated with the LAPS using Pearson's correlation coefficient (r), its value ranges from -1 to + 1, 0 indicates that there is no relationship between the variables and a negative correlation signifies an inverse relationship and a positive correlation signifies a direct relationship. However, it is important to note that if a correlation between two measuring instruments is 1, the measures are exactly the same (Foxcroft & Roodt, 2013). Correlating the two measures was done to serve as an indication of construct validity (Foxcroft & Roodt, 2013; to determine if the OPRS-M measures attitude. Furthermore, if a new measuring instrument correlates highly with an older one that measures the same construct it indicates that the new measure assesses the same construct.

Gerber (2015) found the LAPS to be a valid measure of attachment to pets in the South African context. The pilot study of this study found a positive correlation between the OPRS-M and the LAPS with r = .458, p < .01. The current study found a positive correlation between the OPRS-M and the LAPS with r = .631, p =.001, see Table 6.14 (p. 78). This signifies that the C-DAS is valid for measuring people's attitudes to dogs in South Africa.

7.3.7 Language and gender differences for the OPRS-M

An ANOVA F-test demonstrated no statistically significant difference between English (M = 51, SD = 9.28) and Afrikaans (M = 49.79, SD = 11.07) speaking respondents on the total C-DAS, $F(1, 533) = 1.8903$, $p = .17$, see Table 6.19 and Figure 7 (p. 81). This was further emphasised by Cohen's D obtained for language being 0.12 which means that it is not statistically significant, see Table 6.20 (p. 81) . A similar result was obtained in the pilot study with an independent t-test demonstrating no statistically significant difference between English (M = 47.21, SD = 8.41) and Afrikaans (M = 46.82, SD = 8.78) speaking respondents. Furthermore, a small statistically significant difference were found between females (M = 51.17, SD = 9.89) and males (M = 48.12, SD = 10.88) in the current study $F(1, 533) = 9.2438$, $p < 0.01$, see Table 6.27 and Figure 11 (p. 85). Additionally Cohen's D for gender for the OPRS-M was 0.3 indicating a negligible effect size, see Table 6.28 (p. 85).

The pilot study found no differences with regards to gender with no significant difference being found between females (M = 47.14., SD = 8.62) and males (M = 46.35, SD = 8.68) on the total OPRS-M, , $t(100) = -.422$, $p = .674$. Thus, when used in the South African context, the OPRS-M demonstrates no language differences and a small gender difference with females being slightly more attached to their dogs.

7.3.8 Language and gender differences for the LAPS

An ANOVA F-test demonstrated no statistically significant difference between English (M = 81.34, SD = 11.66) and Afrikaans (M = 80.77, SD = 13.62) speaking respondents on the total C-DAS, $F(1, 533) = .26927$, $p = 0.6$, see Table 6.21 and Figure 8 (p. 82). This was further emphasised by Cohen's D obtained for language being 0.042 indicating a negligible effect size, see Table 6.22 (p. 82). A similar result was obtained in the pilot study with an independent t-test demonstrating no statistically significant difference between English (M = 61.50, SD = 14.31) and Afrikaans (M = 60.09, SD = 14.52) speaking respondents.

Furthermore, a statistically significant difference was found between females (M = 82.49, SD = 10.88) and males (M = 76.85, SD = 16.17) in the current study $F(1, 533) = 20.971, p < 0.01$, see Table 6.29 and Figure 12 (p. 86). In addition, Cohen's D for gender for the LAPS was 0.45 which indicates medium statistical significance, see Table 6.30 (p. 86). The pilot study found no differences with regards to gender with no significant difference being found between females (M = 62.72., SD = 13.46) and males (M = 56.29, SD = 15.41) on the total LAPS, , $t(100) = -2.12, p = .036$. Thus, when used in the South African context, the LAPS demonstrates no language differences and a statistically significant medium gender difference with females being slightly more attached to their pets.

7.4 THEORY

As seen from the results obtained from the C-DAS and PAS-M, the current study found South Africans to have positive attitudes towards pets and dogs. This can be explained by the Biophilia theory of E.O. Wilson (1984) that postulates that human beings are genetically prone to live harmoniously and closely with animals and nature. The biophilia theory further sets forth that humans are naturally prone to want to live in close proximity to dogs and other pets. As can be seen by the results from the four measuring instruments, South Africans are fond of their dogs and pets and want to have them inside their homes.

The results obtained from the OPRS-M and the LAPS indicate that South Africans are attached to their pets. The attachment theory of Ainsworth (1969) and Bowlby (1982) can explain this. Attachment is denoted by proximity seeking behaviour which means that the individual will try to be in close physical proximity to their attachment figure. In the case with owners and their dogs and pets, the proximity seeking behaviour is mutual. From the results of the OPRS-M and the LAPS we can see that dog and pet owners want their dogs and pets close to them and they do not like leaving their pets with other people or outside of their homes.

7.5 LIMITATIONS

This study has a few limitations. Due to the electronic format of the survey, although it enabled data collection without being bound by geographical boundaries, only participants with access to the internet and a device such as a phone, tablet or computer could complete it.

The survey was only translated to Afrikaans. This meant that although it was now available in Afrikaans and English, it only represented two out of the 11 official languages of South Africa. If a participant did not have the capacity to read and understand English or Afrikaans, they were not able to complete the survey.

The majority of the participants in this study were female, aged between 20 and 30, had Afrikaans as a home language and lived in towns in the Western Cape. The findings cannot be generalised to the larger South African population.

This survey that had to be completed by the participants was quite long. Although the consent form states that it would take only 10 – 15 minutes to complete the survey, altogether the full measure consisted of 96 questions. This was done as the measures had to be correlated with other measures that have been proven valid and reliable in South Africa. Having measures that are too long can cause the participants to suffer from boredom effect. This is based on the assumption that participants' performance on a task or measure can be negatively influenced by boredom or lack of concentration (Field, 2013).

The online SUrvey site has an interface that is hard to read and follow. The colours and fonts used are quite bland and the highlighted parts of the survey were hard to read. Furthermore, the layout of the survey was affected by the interface of SUrvey. Depending on what device is used to complete the survey, the headings of the questions that contained the option descriptions did not accompany the items as the participant scrolled down. This meant that in order to see which of the columns contained their desired response, the participants had to continuously scroll up and down while they were completing the measures.

7.6 RECOMMENDATIONS

It is recommended that future research focuses on how reliable and valid these measuring instruments are for South Africans under the age of 18. It could be interesting to see how attachment to pets in children relates to their resiliency.

In order to nullify the limitation posed by the sole availability of the survey on the internet, researchers can make a paper-based version of the measure and hand it out to people to complete. This will make sure that the measure is accessible to South Africans regardless of whether they have access to the internet or not.

It is recommended that future research translates the measures into some of the other 11 official languages of South Africa. Although English is widely spoken in our country, many people in rural areas do not speak or read English or Afrikaans.

By making the above adjustments, the demographic characteristics of this sample might be more diverse. It is recommended that future research focuses on the participation of a sample that is more inclusive and reflective of the cultural composition of South Africa.

It is recommended that future research look at ways to shorten the survey used. This can be done by breaking up the survey into two parts with the C-DAS and the PAS-M forming one survey and the OPRS-M and the LAPS forming another survey.

Lastly, it is recommended that future research explores other survey sites such as Survey Monkey. These sites are designed with optimal user interface experience in mind. They have set parameters programmed into the structure of the website to ensure the ease of use for the participants.

7.7 SUMMARY OF THIS STUDY

This study set out to establish the suitability of using the C-DAS and OPRS-M in South Africa. South Africa is a vibrant and diverse country and also one of the leading countries with regards

to pet-ownership (Maharaj, 2017). It is for this reason that this study set out to establish the validity and reliability of the C-DAS and OPRS-M in South Africa.

In order to do this, measures developed in the USA and Norway were translated from the initial English into Afrikaans. The English and Afrikaans versions were then put into an electronic format using SUrveys, the University of Stellenbosch's electronic survey site.

The measures were administered along with a biographical information questionnaire and two additional measures that have already been proven valid and reliable in the South African context. These two measures are the LAPS and the PAS-M. The LAPS measures people's attachment to pets, just like the OPRS-M measures people's attachment to pets. The PAS-M measures people's attitudes towards pets, like the C-DAS measures people's attitudes to dogs.

The total sample for this study consisted of 535 current or past pet owners. The participants had to be South African citizens over the age of 18. The Cronbach's alpha for the C-DAS was found to be .98 which means that is a reliable measure to use in South Africa. Correlations run between the C-DAS and the PAS-M indicate that the C-DAS is a valid measure of attitudes towards dogs in South Africa. The Cronbach's alpha for the OPRS-M was .94 which indicates that it is a valid measure to use in South Africa. Correlations run between the OPRS-M and the LAPS indicate that the OPRS-M is a valid measure of attachment to dogs in South Africa.

Participants were invited to take part in this study via email invitations and links on social media such as Facebook. Anyone with the link to the survey could complete it. It was also optimised for mobile so participants could complete it on their tablets or cell phones.

After the data was collected, it was analysed using SPSS 25, Statistica 13 and Lavaan. The data analysis revealed the measures to be valid and reliable in the South African context.

7.8 CONCLUSION

Psychological measuring instruments have been successfully used in the HAI field in South Africa. However, robust empirical evidence on the reliability and validity of these measures when used in South Africa is very sparse. Prior studies in the field have not focussed on the in-depth statistical analysis of the instruments to establish validity, reliability and general suitability for the South African context.

The present study aimed to generate empirical evidence concerning the psychometric properties and the suitability of the C-DAS, LAPS, PAS-M and OPRS-M in South Africa. The participants of this study included South African adult past and current pet owners (N=535). The statistical analysis of the data revealed that the C-DAS and OPRS-M is valid and reliable and can be used in South Africa. The statistical analysis further re-affirmed the validity and reliability of the LAPS and the PAS-M in South Africa.

The present study has several limitations. The biggest being that for both the pilot study and the main study, most of the participants were white, Afrikaans speaking and female. Most of the participants also resided in towns in the Western Cape.

Having measures that effectively measure universal concepts such as attachment to pets and people's attitudes towards pets globally will contribute vastly to the evaluation of the efficacy of animal-assisted interventions and animal-assisted therapy.

It is recommended that future research focuses on a randomised sample that is more diverse, includes people from all ethnicities in South Africa, genders and participants residing outside of the Western Cape. Translating the measuring instruments into some of the other 11 official languages of South Africa could potentially yield different results and should thus be explored in future research.

REFERENCES

Acton, C., & Miller, R. (2009). *SPSS for social scientists* (2nd ed.). London, United Kingdom: Palgrave Macmillan.

Ainsworth, M. (1969). Object relations, dependency and attachment: A theoretical review of the mother-infant relationship. *Child Development, 40,* 969-1025.

Ajzen, I. (2011). *Attitudes, personality and behaviour*. (2nd ed.). Open University Press, Berkshire, England.

Anderson, D. C. (Ed.). (2007). *Assessing the human-animal bond: A compendium of actual measures.* West Lafayette, IN: Purdue University Press.

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

Antonius, R. (2013). *Interpreting Quantitative data with IBM SPSS statistics*. (2nd ed.). SAGE London, England.

Beatson, R., Loughnan, S., & Halloran, M. (2009). Attitudes towards animals: The effect of priming thoughts of human-animal similarities and mortality salience on the evaluation of companion animals. *Society and Animals, (17),* 72-89.doi: 10.1163/156853009X393774

Beetz, A., & Bales, K. 2016. Affiliation in human-animal interaction. In L. S. Freund, S. McCune, L. Esposito, N. R. Gee, P. McCardle (Eds.), *The social neuroscience of human-animal interaction*. USA: APA.

Berk, L. E. (2009). *Child development* (8th ed.). New York, NY, US: Pearson International.

Bless, C., Higson-Smith, C., & Kagee, A. (2009). *Social research methods: An African perspective* (4h ed.). Cape Town, South Africa: Juta & Co. Ltd.

Bowlby, J. (1982). *Attachment and loss.* New York, NY: Basic Books Publishing.

Boyd, L. (2015). *"When he's up there he's just happy and content": Parents' perceptions of therapeutic horseback riding* (Unpublished master's thesis). Stellenbosch University: South Africa. Retrieved from http://hdl.handle.net/10019.1/96745

Brace, N., Kemp, R., & Snelgar, R. (2013). *SPSS for psychologists.* (5th ed.). New York, NY: Routledge.

Bradshaw, J. W., & Limond, J. (1997). *Attachment to cats and its relationship to emotional support : A cross cultural study.* Paper presented at International Society for Anthrozoology Conference, Boston, USA, July 24-25.

Bryman, A. (2008). *Social research methods* (3rd ed.). New York, NY, US: Oxford University Press.

Buckle, C. (2015). *Effects of an animal visitation intervention on the depression, loneliness, and quality of life of older people: A randomized control study.* (Unpublished Master's thesis). Stellenbosch University: South Africa. Retrieved from http://scholar.sun.ac.za/handle/10019.1/98082

Cangur, S., & Ercan, I. (2015) Comparison of model fit indices used in structural equation modelling under multivariate normality, *Journal of Modern Applied Statistical Methods 14*(1) 152-167. DOI: 10.22237/jmasm/1430453580

Carlucci, M. E., & Wright, D. B. (2012). Inferential statistics. In G. M. Breakwell, J. A. Smith, & D. B. Wright (Eds.), *Research methods in psychology.* (4th ed., pp. 191- 209). London, England: SAGE.

Castelli, P., Hart, L., & Zasloff, R. (2001). Companion cats and the social support systems of men with AIDS. *Psychological Reports, 89,* 177-187. doi:10.2466/PR0.89.5.177-187

Cloete, H., J. (2016). *Die psigometriese eienskappe van die Eienaar-Troeteldier Verhoudingskaal (Owner Pet Relationship Scale): 'n Suid-Afrikaanse loodstudie*. (Unpublished honours thesis). Stellenbosch University: South Africa.

Clowney, D. (2013). Biophilia as an environmental virtue. *Journal of Agricultural and Environmental Ethics, 26*(5), 999-1014. doi: 10.1007/s10806-013-9437-z

Coleman, J. A., Green, B., Garthe, R. C., Worthington, E. L., Barker, S. B., Ingram, K. M., (2016) The Coleman Dog Attitude Scale (C-DAS): Development, refinement, validation, and reliability. *Applied Animal Behaviour Science, 176*, 77-86. doi: dx.doi.org/10.1016/j.applanim.2016.01.003

Dray, T., (2018). Number of cats and dogs in households worldwide. *Nest* (blog). Retrieved from http://pets.thenest.com/number-dogs-cats-households-worldwide-8973.html

Durheim, K., & Painter, D. (2011). Collecting quantitative data: Sampling and measuring. In M. Terreblance, K. Durheim & D. Painter (Eds.), *Research in practice: Applied methods for the social sciences.* (2nd ed.). (pp. 131-159). South Africa: University of Cape Town Press.

El-Alayi, A., Lystad, A., Webb, S., Hollingsworth, S., & Ciolli, J. (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 Psychology, 28*(2), 131-143. doi: 10.1207/s15324834basp2802_3

Esposito, L., McCardle, P., Maholmes, V., McCune, S., & Griffin, J. A. (2011). Introduction. In P. McCardle, S. McCune, J. A. Griffin, L. Esposito, & L. S. Freund (Eds.), *Animals in our lives: Human-animal interaction in family, community, & therapeutic settings* (pp. 1-5). Baltimore, Maryland: Paul H. Brookers Publishing Co.

Field, A. P. (2013). *Discovering statistics using SPSS: And sex and drugs and rock 'n' roll* (4th ed.). Los Angeles, California: SAGE Publications.

Fine, A. H., & Beck, A. M. (2015) Understanding our kinship with animals: Input for healthcare professionals interested in the human-animal bond. In A. Fine (Ed.), *The handbook on animal-assisted therapy* (4th ed., pp. 3-10). London, UK: Academic Press.

Fine, A.H. (2015) (Ed.), *The handbook on animal-assisted therapy* (4th ed). London, UK: Academic Press.

Foxcroft, C. D. (2011). Ethical issues related to psychological testing in Africa: What I have learned (so far). *Online Readings in Psychology and Culture*, 2(2). http://dx.doi.org/10.9707/2307-0919.1022

Foxcroft, C., & Roodt, G. (2013). *Introduction to psychological assessment in the South African context*. Cape Town, South Africa: Oxford University Press Southern Africa.

Foxcroft, C.D., Paterson, H., Le Roux, N., & Herbst, D. (2004). *Psychological assessment in South Africa: a needs analysis.* Pretoria: HSRC.

Friedman, E., Katcher, A. H., Lynch, J. J., & Thomas, S. A. (1980). Animal companions and one year survival after discharge from a coronary care unit. *Public Health Reports, 95*, (4), 307-312. Retrieved from https://www.researchgate.net/publication/16198564_Animal_companions_and_one_year_survival_after_discharge_from_a_coronary_care_unit

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://hdl.handle.net/10019.1/98382

González Ramírez, M., Quezada Berumen, L., & Hernández, R. (2014). Psychometric properties of the Lexington Attachment to Pets Scale: Mexican version (LAPS-M), *Anthrozoös, 27*(3), 351-359.

Hambleton, R. K., & Zenisky, A. L. (2011) Translating and adapting tests for cross-cultural assessments. In D. Matsumoto, & F. Van de Vijver, F. (Eds.), *Cross-cultural research methods in psychology* (pp. 46-74). New York, NY: Cambridge University Press.

Hawkridge, C. (2017). *Animal-assisted activities for adolescents with autism spectrum disorder: Teacher's and parent's perceptions.* (Unpublished Master's thesis). Stellenbosch University: South Africa. Retrieved from http://scholar.sun.ac.za/handle/10019.1/98082

Herzog, H., Betchart, N. & Pittman, R. (1991). Gender, sex role orientation, and attitudes towards animals. *Anthrozoös* 4(3): 184-192

Herzog, H., Grayson, S., & McCord, D. (2015). Brief measures of the Animal Attitude Scale, *Anthrozoös, 28*(1), 101-108. doi:10.2752/089279315X14129350721894

Jegatheesan, B. (2015). Influence of cultural and religious factors on attitudes towards animals. In A. Fine (Ed.), *The handbook on animal-assisted therapy* (4th ed., pp. 37-41). London, England: Academic Press.

Julius, H., Beetz, A., Kotrschal, K., Turner, D., & Uvnäs-Moberg, K. (2013). *Attachment to pets.* Cambridge, MA, US: Hogrefe Publishing.

Krčmářová, J. (2009). E.O. Wilson's concept of biophilia and the environmental movement in the USA. *Klaudyàn: Internet Journal of Historical Geography and Environmental History, 6*(1-2), 4-17. Retrieved from http://www.klaudyan.cz/dwnl/200901/01_Krcmarova_pdf.pdf

Kurdek, L. A. (2008). Pet dogs as attachment figures. *Journal of Social and Personal Relationships, 25*(2), 247–266. doi: 10.1177/0265407507087958

Kurdek, L. A. (2009). Young adults' attachment to pet dogs: Findings from open-ended methods. *Anthrozoös*, *22*(4), 359–369. doi:10.2752/089279309X12538695316149

Lakestani, N., Donaldson, M. L., Verga, M., & Waran, N. (2011). Attitudes of children and adults to dogs in Italy, Spain, and the United Kingdom. *Journal of Veterinary Behaviour, 6,* 121-129. doi: 10.1016/j.jveb.2010.11.002

Le Roux, M. C., Swartz, L., & Swart, E. (2014). The effect of an animal-assisted reading program on the reading rate, accuracy and comprehension of grade 3 children: A randomized controlled study. Child Youth Care Forum, 43, 655-673. doi:10.1007/s10566-014-9262-1

Le Roux, M., & Kemp, R. (2009). Effect of companion dog on depression and anxiety levels of elderly residents in a long-term care facility. *Psychogeriatrics, 9,* 23-26. doi:10.1111/j.1479-8301.2009.00268.x

Levinson, B. M. (1997). *Pet-oriented child psychotherapy.* Springfield, IL, US: Charles C Thomas Pub Ltd.

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

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

Miller, P. G., Johnston, J., Dunn, M., Fry, C. L., & Degenhardt, L. (2010). Comparing probability and non-probability sampling methods in ecstasy research: Implications for the internet as a research tool. *Substance Use and Misuse, 45*(3), 437 – 450.

Miura, A., Bradshaw, J. W. S., & Tanida, H. (2000). Attitudes towards dogs: A study of university students in Japan and the UK. *Anthrozoös, 13*(2), 80-88. doi: 10.2752/089279300786999860

Montoya, A. F. (2009). Medievalism and enlightenment, 1647-1750: Jean Chapelain to Jean-Jacques Rousseau. *Romantic Review, 100* (4), 494-512. Retrieved from http://web.a.ebscohost.com.ez.sun.ac.za/ehost/pdfviewer/pdfviewer?vid=2&sid=44471d2b-cab2-4d93-84a8-3a4c5f6b2336%40sdc-v-sessmgr03

Munsell, K. L., Canfield, M., Templer, D. I., Tangan, K., & Arikawa, H. (2004). Modification of the Pet Attitude Scale. *Society & Animals, 12*(2), 137-142. doi: 10.1163/1568530041446580

Nagasawa, M., Mogi, K., & Kikusui, T. (2009). Attachment between humans and dogs. *Japanese Psychological Research, 51*(2), 209-221. doi: 10.1111/j.1468-5884.2009.00402.x

Neuman, W. L. (2014). *Social research methods: Qualitative and quantitative approaches* (7th ed). Essex, UK: Pearson.

O'Haire, M. (2010). Companion animals and human health: Benefits, challenges, and the road ahead. *Journal of Veterinary Behaviour, 5*, 226-234. doi:10.1016/j.jveb.2010.02.002

Odendaal, J. S. J. (2000). Animal-assisted therapy, magic or medicine? *Journal of Psychosomatic Research, 49*, 275-280. doi:10.1016/S0022-3999(00)00183-5

Paul, E. S. (2000). Empathy with animals and with humans: Are they linked?. *Anthrozoös* 13(4): 194-202.

Petsecure. (2019) *A guide to worldwide pet ownership.* Retrieved from http://www.petsecure.com.au/pet-care/a-guide-to-worldwide-pet-ownership/

Planchon, L. A., Templer, D. I., Stokes, S., & Keller, J. (2002). Death of a companion cat or dog and human bereavement: Psychological variables. *Society & Animals, 10*(1), 93-105.

Quinn, A., C. (2005) *An examination of the relations between human attachment, pet attachment, depression, and anxiety* (Unpublished Doctoral dissertation, Iowa State University). Retrieved from http://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=2850&context=rtd

Rasch, D., Kubinger, K. D., & Yanagida, T. (2012). *Statistics in psychology Using R and SPSS*. West Sussex, United Kingdom: John Wiley & Sons Ltd.

Rust, J. (2012). Psychometrics. In G. M. Breakwell, J. A. Smith, & D. B. Wright (Eds.), *Research methods in psychology.* (4th ed., pp. 141-161). London, England: SAGE.

Serpell, J. A. (2015). Animal-assisted interventions in historical perspective. In A. Fine (Ed.), *The handbook on animal-assisted therapy* (4th ed., pp. 11-19). London, England: Academic Press.

Shipman, P. (2010). The animal connection and human evolution. *Current Anthropology, 51*, (4), 519-538.doi: 10.1086/653816

Shubert, J. (2012). Dogs and human health/mental health: From the pleasure of their company to the benefits of their assistance. *The Army Medical Department Journal. (April-June)* 21-29 retrieved from http://www.warriorcanineconnection.org/wp-content/uploads/2014/05/AMEDD-Full-Journal-April-June-2012.pdf

Signal, T., & Taylor, N. (2007). Attitudes to animals and empathy: Comparing animal protection and general community samples. *Anthrozoös, (20)*2, 125-130. doi: 10.2752/175303707X207918

Slade, A. (2008). The implications of attachment theory and research for adult psychotherapy: Research and clinical perspectives. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (pp. 762-782). New York, NY, US: The Guilford Press.

Smith, C. (2016). *The psychometric properties of the Coleman Dog Attitude Scale (D-DAS) in the South African context: A pilot study*. (Unpublished honours thesis). Stellenbosch University: South Africa.

Solomon, J. (2012). Foreword. In H. Julius, A. Beetz, K. Kotrschal, D. Turner, & K. Uvnäs-Moberg (Eds.), *Attachment to pets* (pp. v-vi.). Cambridge, MA, US: Hogrefe Publishing.

The South African Constitution. (2005). *Children's Act no 38 of 2005*. Retrieved from: http://www.justice.gov.za/legislation/acts/2005-038%20childrensact.pdf

Tielsch Goddard, A., & Gilmer, M. J., (2015). The role and impact of animals with paediatric patients. *Paediatric Nursing, 41*(2), 65-71.

Van Besouw, J. R. (2017). *Animal-assisted activities in a halfway facility: A case study.* Unpublished Master's thesis). Stellenbosch University: South Africa. Retrieved from http://scholar.sun.ac.za/handle/10019.1/101292

Van der Horst, F. C. P. (2011). *John Bowlby – from psychoanalysis to ethology: Unravelling the roots of Attachment Theory.* (1st ed.). UK: John Wiley and Sons, Ltd.

Walsh, F. (2009). Human-animal bonds I: The rational significance of companion animals. *Family Process, 48*(4), 462-480. Retrieved from http://onlinelibrary.wiley.com/doi/10.1111/j.1545-5300.2009.01296.x/epdf

Wigget, C. (2006). *Guide dog ownership and psychological well-being.* (Unpublished Master's thesis). Stellenbosch University: South Africa. Retrieved from http://scholar.sun.ac.za/handle/10019.1/3093

Wilson, C. C., & Netting, F. E. (2012). The status of instrument development in the human-animal interaction field. *Anthrozoös, 25*(sup1), 11-55. doi:10.2752/175303712X13353430376977

Wilson, E. O. (1984). *Biophilia.* Cambridge, MA, US: Harvard University Press.

Winefield, H. R., Black, A., & Chur-Hansen, A. (2008). Health effects of ownership and attachment to companion animals in an older population. *International Journal of Behavioural Medicine, 1,* 303-310. doi: 10.1080/10705500802365532

Woodward, L., & Bauer, A. (2007). People and their pets: A relational perspective on interpersonal complementarity and attachment in companion animal owners. *Society and Animals, 15,* 169-189. doi: 10.1163/156853007X187117

Wright, S. (2018). *The relationship between pet attachment, perceived stress and life satisfaction: An online survey.* (Unpublished Master's thesis). Stellenbosch University: South Africa. Retrieved from http://scholar.sun.ac.za/handle/10019.1/103362

Wyatt, K. S. (2016). *The effect of an animal-assisted visitation programme on children with intellectual disabilities: A randomised controlled study.* (Unpublished Master's thesis). Stellenbosch University: South Africa. Retrieved from http://scholar.sun.ac.za/handle/10019.1/100040

Zasloff, R. (1996). Measuring attachment to companion animals: A dog is not a cat is not a bird. *Applied Animal Behaviour Science, 47,* 43-48.

Zilcha-Mano, S., Mikulincer, M., & Shaver, P. (2011). An attachment perspective on human-pet relationships: Conceptualization and assessment of pet attachment orientations. *Journal of Research in Personality, 45*, 345-357. doi: 10.1016/j.jrp.2011.04.0

Appendix A: Invitation to participate

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INFORMATION FOR PARTICIPANTS

Dear Participant

You are invited to participate in a research study that is interested in your attachment and attitude towards your pet.

This study has received ethical approval from Stellenbosch University (ref: SU-HSD-002903)

This study is being conducted by the following persons:

- Dr Marieanna le Roux, Department of Psychology, Stellenbosch University, South Africa
- Ms Mia Esterhuyzen, Stellenbosch University, South Africa
- Ms Este Cloete, Stellenbosch University, South Africa
- Ms Caitlin Smith, Stellenbosch University, South Africa

When you start the survey, you will be asked to answer a few questions about your background and your pet. This will be followed by more questions about your relationship with your pet.

This survey should take approximately 10-15 minutes to complete. In order to complete this survey, you must be a South African citizen and at least 18 years old.

The information you provide will be completely anonymous because no personal data will be collected to identify you (for example your name). Although you have been contacted to take part in this study via your email address, it will not be used for any other reason.

The data collected during this survey will be stored on password-protected computers and will only be used by the researchers mentioned above.

The researchers intend to use the results of this study to contribute knowledge to the field of human-animal interaction.

Once you have decided to participate, you can withdraw anytime during the completion of the survey. Once you have submitted the survey, it will be completely anonymous and your answers will not be traced back to your email address.

If you have any questions about this research, please contact Mia Esterhuyzen at petssa2016@gmail.com or Dr Marieanna le Roux at mclr@sun.ac.za .

Please click on the link below that will take you to the survey.

example@sun.link.petssa.co.za.ac.za

Appendix B: Uitnodinging om deel te neem

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INFORMASIE VIR DEELNEMERS

Beste Deelnemer

U word uitgenooi om deel te neem aan `n navorsingstudie wat belangstel in u houding teenoor en gehegtheid aan u troeteldier.

Hierdie studie het etiese goedkeuring van die Universiteit Stellenbosch (SU-HSD-002903).

Die studie word uitgevoer deur die volgende persone:

- Dr. Marieanna le Roux, Departement Sielkunde, Universiteit Stellenbosch, Suid-Afrika
- Me Mia Esterhuyzen, Universiteit Stellenbosch, Suid-Afrika
- Me Este Cloete, Universiteit Stellenbosch, Suid-Afrika
- Me Caitlin Smith, Universiteit Stellenbosch, Suid-Afrika

Wanneer u die vraelys begin, sal u gevra word om ‘n paar vrae te beantwoord oor u agtergrond en u troeteldier. Dit sal gevolg word deur meer vrae oor u verhouding met u troeteldier.

Dit sal omtrent 10-15 minute duur om die vraelys in te vul. Om deel te neem aan hierdie studie moet u ten minste 18 jaar oud en `n Suid-Afrikaanse burger wees.

Die inligting wat u verskaf, sal heeltemal anoniem wees omdat geen persoonlike inligting ingesamel sal word om u te identifiseer nie (soos byvoorbeeld u naam). Alhoewel daar met u in verbinding getree is deur middel van u e-pos-adres, sal dit vir geen ander doeleindes gebruik word nie.

Die inligting wat ingesamel word deur middel van hierdie vraelys, sal geberg word op wagwoord-beskermde-rekenaars en sal slegs gebruik word deur die bogenoemde navorsers.

Die navorsers beoog om die uitslae van hierdie studie te gebruik om kennis by te dra tot die veld van mens-dier-interaksie.

Nadat u besluit het om deel te neem, mag u te eniger tyd besluit om te onttrek gedurende die invul van die vraelys. Sodra u die vraelys ingevul het, sal dit heeltemal anoniem wees en sal u antwoorde nie teruggevolg kan word na u e-pos-adres nie.

Indien u enige vrae oor hierdie studie het, tree asseblief in verbinding met Mia Esterhuyzen by petssa2016@gmail.com of dr. Marieanna le Roux by mclr@sun.ac.za

Volg assebief die volgende skakel om na die vraelys te gaan:

example@link.petssa.ac.za

Appendix C: Consent Form

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Dear Participant

You are asked to participate in a research study conducted by Mia Esterhuyzen, Esté Cloete and Caitlin Smith from the Psychology Department at Stellenbosch University. The results will be used in a MA thesis as well as in two Honours theses. You were selected as a possible participant in this study because you are a South African citizen, currently own a pet or have done so in the past, and are over 18 years of age.

1. **PURPOSE OF THE STUDY**

This study has two research aims; the first aim is to explore the psychometric properties of the Coleman Dog Attitude Scale (C-DAS) and the Owner-Pet Relationship Scale Modified (OPRS-M) when applied to the South African context. The second aim is to measure the attachment and attitudes of South Africans towards their pets.

2. **PROCEDURES**

If you volunteer to participate in this study, we would ask you to do the following:
Answer the following questions as honestly as possible. To complete the survey will take approximately 10-15 minutes.

3. **POTENTIAL RISKS AND DISCOMFORTS**

There are no foreseeable risks associated with this study. If any discomfort is experienced due to completing this survey you are welcome to contact the researchers, Caitlin Smith (17732387@sun.ac.za) and Esté Cloete (16062337@sun.ac.za), or the primary researcher, Mia Esterhuyzen at petssa2016@gmail.com or the supervisor, Dr M.C. Le Roux at mclr@sun.ac.za, in order to put the affected persons in contact with psychologists.

4. POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

By participating in this study you provide an important contribution to the field of Human-Animal Interaction.

Science and society will gain the benefit of knowledge contribution.

5. PAYMENT FOR PARTICIPATION

You will receive no payment for taking part in this study.

6. CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of anonymising the participation process. The answers you provide will not be traced back to you. Electronic data will be securely stored on password-protected computers. The researchers and the supervisor are the only people who will have access to the data.

None of your individual information will be given to other parties.

No activities will be recorded on tape.

Confidentiality will be handled in the publication process, as the researcher will not be able to identify you due to the anonymising of the data collection process.

7. PARTICIPATION AND WITHDRAWAL

You can choose whether to take part in this study or not. If you volunteer to take part in this study, you may withdraw at any time during the completion of the survey without consequences of any kind. You may also refuse to answer any questions you do not want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

8. IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact the researchers, Caitlin Smith (17732387@sun.ac.za) and Esté Cloete (16062337@sun.ac.za), or the primary investigator, Mia Esterhuyzen at petssa2016@gmail.com, or the supervisor, Dr M.C. Le Roux at mclr@sun.ac.za .

9. RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, contact Ms Maléne Fouché (mfouche@sun.ac.za or 021 808 4622) at the Division for Research Development.

If you have read the above information and are willing to participate in this study please select the "yes" option, indicating that you understand the terms and conditions of this study and your participation in this study. If you do not want to participate, select the "no" option.

☐ YES

☐ NO

Yours sincerely,

Caitlin Smith — Researcher

Esté Cloete — Researcher

Mia Esterhuyzen
Principal Investigator

Dr. M.C. Le Roux
Supervisor

Appendix D: Toestemmingsvorm

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Geagte Deelnemer

U word gevra om deel te neem aan ’n navorsingstudie deur Mia Esterhuyzen, Meesterstudent, Esté Cloete en Caitlin Smith, Honneursstudente van die Departement Sielkunde aan die Universiteit Stellenbosch. Die resultate sal deel word van ’n MA-tesis, sowel as twee Honneurs-tesisse. U is as moontlike deelnemer aan die studie gekies omdat u tans `n troeteldier het, of in die verlede een gehad het, ’n Suid-Afrikaanse burger is en bo die ouderdom van 18 is.

1. **DOEL VAN DIE STUDIE**

Die eerste doel van hierdie studie is om die geldigheid en betroubaarheid van die skale (Die Coleman-Houding-Teenoor-Honde-Skaal en die Eienaar-Troeteldier-Verhouding-Skaal-Gewysig) in die Suid-Afrikaanse konteks te bepaal.

Die tweede doel van hierdie studie is om vas te stel hoe geheg Suid-Afrikaners aan hul troeteldiere is, sowel as om te kyk na die houdings van Suid-Afrikaners teenoor hul troeteldiere.

2. **PROSEDURES**

Indien u inwillig om aan die studie deel te neem, vra ons dat u die volgende moet doen:
Die volgende vrae so eerlik as moontlik beantwoord. Om die vraelys in te vul sal ongeveer 10-15 minute duur.

3. **MOONTLIKE RISIKO’S EN ONGEMAK**

Daar is geen voorsienbare risiko’s, ongemak of ongerief nie. Indien daar enige ongerief ontstaan as gevolg van die invul van die vraelys, kan die deelnemer met die navorsers, Caitlin Smith (17732387@sun.ac.za) en Esté Cloete (16062337@sun.ac.za), of die hoofnavorser, Mia Esterhuyzen, by petssa2016@gmail.com of die studieleier, dr Marieanna le Roux, by mclr@sun.ac.za in verbinding tree sodat die geaffekteerde persone na `n sielkundige verwys kan word.

4. MOONTLIKE VOORDELE VIR PROEFPERSONE EN/OF VIR DIE SAMELEWING

Deur deel te neem aan hierdie studie kan u gerus voel dat u `n baie belangrike bydrae verrig het in die veld van Mens-Dier-Interaksie.

Die wetenskap en die samelewing sal die voordeel van kennisbydrae kry.

5. VERGOEDING VIR DEELNAME

U sal geen vergoeding kry vir u deelname aan hierdie studie kry nie.

6. VERTROULIKHEID

Enige inligting wat deur middel van die navorsing verkry word en wat met u in verband gebring kan word, sal vertroulik bly en slegs met u toestemming bekend gemaak word of soos deur die wet vereis. Vertroulikheid sal gehandhaaf word deur middel van die anonimisering van die vraelyste gedurende die data-insamelingsproses. Dit verseker dat u antwoorde op geen manier terug gevolg kan word na u toe nie. Die data sal beskerm word op wagwoord-beskermde rekenaars Die navorsers en studieleier is al persone wat toegang sal hê tot die data.

Geen van u individuele inligting sal aan ander party bekend gemaak word nie.

Geen aktiwiteite sal op band opgeneem word nie.

Vertroulikheid sal gehandhaaf word in die publikasieproses, omdat dit nie vir die navorser moontlik sal wees om u te identifiseer nie, as gevolg van die anonimisering van die data insamelingsproses.

7. DEELNAME EN ONTTREKKING

U kan self besluit of u aan die studie wil deelneem of nie. Indien u inwillig om aan die studie deel te neem, kan u te eniger tyd van die invul van die vraelys u daaraan onttrek sonder enige nadelige gevolge. U kan ook weier om op bepaalde vrae te beantwoord, maar steeds aan die studie deelneem. Die ondersoeker kan u aan die studie onttrek indien omstandighede dit noodsaaklik maak.

8. IDENTIFIKASIE VAN ONDERSOEKERS

Indien u enige vrae of besorgdheid omtrent die navorsing het, staan dit u vry om in verbinding te tree met die navorsers, Caitlin Smith (17732387@sun.ac.za) en Esté Cloete (16062337@sun.ac.za), of die hoofondersoeker, Mia Esterhuyzen by petssa2016@gmail.com, of die studieleier, Dr M.C. le Roux by mclr@sun.ac.za.

9. REGTE VAN PROEFPERSONE

U kan te eniger tyd u inwilliging terugtrek en u deelname beëindig, sonder enige nadelige gevolge vir u. Deur deel te neem aan die navorsing doen u geensins afstand van enige wetlike regte, eise of regsmiddel nie. Indien u vrae het oor u regte as proefpersoon in die navorsing, skakel met me. Maléne Fouché (mfouche@sun.ac.za of 021 808 4622) van die Afdeling Navorsingsontwikkeling.

Indien u die bogenoemde informasie gelees het en gewillig is om deel neem aan hierdie studie, kies die "ja"-opsie. Hiermee verklaar u dat u die terme en voorwaardes van die studie en u deelname hieraan verstaan en instem om hieraan deel te neem. Indien u nie wil deelneem nie, kies die "nee"-opsie.

☐ JA

☐ NEE

Vriendelike groete.

Caitlin Smith	Esté Cloete
Navorser	Navorser

Mia Esterhuyzen
Hoofnavorser

Dr. M.C. Le Roux
Studieleier

Appendix E: Biographical Questionnaire: English

Please answer the following questions as honestly as possible:

1. Are you a South African citizen?
2. In which province are you currently residing?
3. Please select the option that best describes the area you live in

   City

   Suburban Area

   Town

   Farm
4. Which of the following is your home language? Please select one.

   Afrikaans

   English

   isiXhosa

   isiNdebele

   isiZulu

   Sesotho sa Leboa

   Sesotho

   Setswana

   siSwati

   Tshivenda

   Xitsonga
5. How old are you in years?
6. What is your gender?

   Male

   Female
7. What ethnicity best describes you?

   Asian

   Black

   Coloured

   White

   Other

8. Which of the following best describes your relationship status?

   Single

   In a relationship

   Married

   Not married, but living together

9. What is the highest level of education you have obtained?

   No formal schooling

   Grade 9

   Matric

   Diploma

   Degree, or qualification equal to a university degree

   Honours degree

   Masters degree

   PhD

10. Do you have a pet at this moment?

    Yes

    No

11. If you do not currently own a pet, have you owned a pet in the past?

    yes

    No

12. Do you (or have you in the past) own a dog or a cat or both or other?

    Dog

    Cat

    Both

    Neither

    Other

13. How many pets do you currently own?

14. What pets do you currently own? Select all that apply.

    Dog

    Cat

    Fish

    Bird

    Horse

    Reptile

    Rodent

    Other

15. What type of animal is your most beloved pet?

    Dog

    Cat

    Horse

    Bird

    Reptile

    Rodent

    Fish

    Other

16. Which of the following best describes your eating habits

    Carnivore (eats only meat)

    Omnivore (eats everything)

    Vegetarian (eats fruit, vegetables, eggs and dairy products)

    Vegan (eats fruit and vegetables, but no animal products such as eggs or dairy products)

Appendix F: Biografiese Vraelys Afrikaans

Beantwoord asseblief dievolgende vrae so eerlik as moontlik:

1. Is u ’n Suid-Afrikaanse landsburger? Ja, Nee
2. In watter provinsie woon u tans?
3. Kies asseblief die opsie wat die beste beskyf waar u tans woon?

   Stad

   Voorstedelike Area

   Dorp

   Plaas
4. Watter een van die volgende is u huistaal?

   Afrikaans

   English

   isiXhosa

   isiNdebele

   isiZulu

   Sesotho sa Leboa

   Sesotho

   Setswana

   siSwati

   Tshivenda

   Xitsonga
5. Hoe oud is u in jare?
6. Wat is u geslag?

   Manlik

   Vroulik
7. Watter etniese groep beskryf u die beste?

   Asiaties

   Swart

   Gekleurd

   Wit

   Ander

8. Watter van die volgende beskryf jou verhoudingstatus die beste?
   Enkellopend
   In ’n verhouding
   Getroud
   Ongetroud, maar woon saam
9. Watter van die volgende opsies beskryf u hoogste vlak van opvoeding die beste?
   Geen formele opvoeding
   Graad 9
   Matriek
   Diploma
   Graad
   Honneurs graad
   Meesters graad
   PhD
10. Het u op die oomblik ’n troeteldier? Ja, Nee
11. Indien u nie op die oomblik ’n troeteldier besit nie, het u in die verlede een besit? Ja, Nee
12. Besit u tans (of het u al in die verlede) ’n hond, ’n kat of albei?
    Slegs ’n Hond(e)
    Slegs ’n kat(tte)
    Albei
    Nie een nie
    Ander
13. Hoeveel troeteldiere besit u op die oomblik?
14. Watter troeteldiere besit u tans? Kies almal wat van toepassing is.
    Hond
    Kat
    Vis
    Voël
    Reptiel
    Knaagdier
    Perd
    Ander

15. Watter tipe dier is u mees geliefde dier?

    Hond

    Kat

    Vis

    Voël

    Reptiel

    Knaagdier

    Perd

    Ander

16. Watter van die volgende psies beskryf jou eetgewoontes die beste

    Karnivoor (eet slegs vleis)

    Omnivoor (eet alles)

    Vegetariër (eet vrugte, groente, eiers en suiwelprodukte)

    Vegan (eet vrugte en groente, maar geen diere producte soos eiers en suiwelprodukte)

Appendix G: Coleman Dog Attitude Scale (C-DAS)

The following statements are indicative of your attitude towards your dog. Please select the option that best describes your attitude towards your dog, with .1= *strongly disagree;* 2= *disagree;* 3= *neither agree nor disagree,* 4= *agree;* 5=*strongly agree.* Remember there are no correct or incorrect answers.

		Strongly disagree 1	Disagree 2	Neither agree nor disagree 3	Agree 4	Strongly agree 5
1	When I see a dog I want to play with it.					
2	I love dogs.					
3	I like to walk dogs.					
4	I enjoy having a dog as a pet, or would if I had one.					
5	When I see a dog I smile.					
6	Dogs comfort me.					
7	I like to pet dogs.					
8	Dogs make me feel loved.					

		Strongly disagree 1	Disagree 2	Neither agree nor disagree 3	Agree 4	Strongly agree 5
9	I like to play with dogs.					
10	I wanted to have a dog when I was a child.					
11	I think dogs are cute.					
12	Dogs make me happy.					
13	I avoid dogs.					
14	I think dogs are fun.					
15	Dogs calm me down.					
16	I would like to live with a dog.					
17	Dogs reduce my stress.					
18	Interacting with dogs makes me feel excited.					
19	I talk to dogs.					

		Strongly disagree 1	Disagree 2	Neither agree nor disagree 3	Agree 4	Strongly agree 5
20	I like being around dogs.					
21	I will share my bed with my dog, or would if I had one.					
22	I think dogs are adorable.					
23	I like to cuddle with dogs.					
24	I hate dogs.					

Appendix H: Coleman Houding Teenoor Honde Skaal (C-DAS)

Die volgende stellings dui op jou houding teenoor jou hond. Kies asseblief die opsie wat jou houding teenoor jou hond die beste beskryf met 1= *verskil sterk;* 2= *verskil;* 3= *stem nóg saam nóg verskil,* 4= *stem saam;* 5=*stem sterk saam.* Onthou daar is geen regte of verkeerde antwoorde nie.

		Verskil sterk 1	Verskil 2	Stem nóg saam nóg verskil 3	Stem saam 4	Stem sterk saam 5
1	Wanneer ek ’n hond sien, wil ek met hom speel.					
2	Ek is lief vir honde.					
3	Ek hou daarvan om met honde te gaan stap.					
4	Ek geniet dit om ’n hond as troeteldier te hê, of sou as ek een gehad het.					
5	Wanneer ek ’n hond sien, glimlag ek.					
6	Honde vertroos my.					
7	Ek hou daarvan om honde te streel.					
8	Honde laat voel my geliefd.					
9	Ek hou daarvan om met honde te speel.					

		Verskil sterk 1	Verskil 2	Stem nóg saam nóg verskil 3	Stem saam 4	Stem sterk saam 5
10	Toe ek ’n kind was wou ek ’n hond hê.					
11	Ek dink honde is oulik.					
12	Honde maak my gelukkig.					
13	Ek vermy honde.					
14	Ek dink honde is pret.					
15	Honde kalmeer my.					
16	Ek sal graag saamet ’n hond wil lewe.					
17	Honde verlaag my spanningsvlakke.					
18	Interaksie met honde laat my opgewonde voel.					
19	Ek praat met honde.					
20	Ek hou daarvan om naby honde te wees.					

		Verskil sterk 1	Verskil 2	Stem nóg saam nóg verskil 3	Stem saam 4	Stem sterk saam 5
21	Ek sal my bed met my hond deel, of sou as ek ’n hond gehad het.					
22	Ek dink honde is dierbaar.					
23	Ek hou daarvan om honde te vertroetel.					
24	Ek haat honde.					

Appendix I: Pet Attitude Scale – Modified (PAS-M)

Please answer each of the following questions as honestly as you can, in terms of how you feel right now. This questionnaire is anonymous and no one will ever know which answers are yours. So, don't worry about how you think others might answer these questions. There aren't any right or wrong answers. All that matters is that you express your true thoughts on the subject. Please answer by selecting one of the following seven numbers for each question.
For example, if you slightly disagree with the first item, you would select the number 3 for slightly disagree.

		Strongly Disagree 1	Moderately Disagree 2	Slightly Disagree 3	Unsure 4	Slightly Agree 5	Moderately Agree 6	Strongly Agree 7
1	I really like seeing pets enjoy their food.							
2	My pet means more to me than any of my friends (or would if I had one).							
3	I would like to have a pet in my home.							
4	Having pets is a waste of money.							
5	House pets add happiness to my life (or would if I had one).							
6	I feel that pets should always be kept outside.							
7	I spend time everyday playing with my pet (or would if I had one).							

		Strongly Disagree 1	Moderately Disagree 2	Slightly Disagree 3	Unsure 4	Slightly Agree 5	Moderately Agree 6	Strongly Agree 7
8	I have occasionally communicated with my pet and understood what it was trying to express (or would if I had one).							
9	The world would be a better place if people would stop spending so much time caring for their pets and started caring more for other human beings instead.							
10	I like to feed animals out of my hand.							
11	I love pets.							
12	Animals belong in the wild or in zoos, but not in the home.							
13	If you keep pets in the house you can expect a lot of damage to furniture.							
14	I like house pets.							
15	Pets are fun but it's not worth the trouble of owning one.							
16	I frequently talk to my pets (or would if I had one).							
17	I hate animals.							
18	You should treat your house pets with as much respect as you would a human member of your family.							

Appendix J: Troeteldierhoudingskaal—Gewysig (PAS-M)

Beantwoord asseblief al die volgende vrae so eerlik as moontlik volgens hoe jy op die oomblik voel. Hierdie is ’n naamlose vraelys en niemand sal ooit weet watter antwoorde joune is nie. So, moenie jou bekommer oor hoe jy dink ander hierdie vrae mag beantwoord nie. Daar is nie enige regte of verkeerde antwoorde nie. Al wat saak maak is dat jy jou ware gedagtes oor die onderwerp uitdruk. Antwoord asseblief deur een van die volgende sewe nommers te omkring.

Byvoorbeeld, as jy in ’n geringe mate nie met die eerste item saamstem nie, kies jy nommer 3 vir stem in geringe mate nie saam nie.

		Stem beslis nie saam nie 1	Stem deels nie saam nie 2	Stem in geringe mate nie saam nie 3	Onseker 4	Stem in geringe mate saam 5	Stem deels saam 6	Stem beslis saam 7
1	Ek hou regtig daarvan om te sien troeteldiere geniet hulle kos.							
2	My troeteldier beteken meer vir my as enige van my vriende (of sou as ek een gehad het).							
3	Ek sal daarvan hou om ’n troeteldier in my huis te hê.							
4	Om troeteldiere aan te hou, is geldmors.							
5	Troeteldiere in die huis dra by tot my geluk in die lewe (of sou as ek een gehad het).							
6	Ek voel troeteldiere moet altyd buite gehou word.							

		Stem beslis nie saam nie 1	Stem deels nie saam nie 2	Stem in geringe mate nie saam nie 3	Onseker 4	Stem in geringe mate saam 5	Stem deels saam 6	Stem beslis saam 7
7	Ek spandeer elke dag tyd om met my troeteldier te speel (of sou as ek een gehad het).							
8	Ek het soms met my troeteldier gekommunikeer en verstaan wat hy probeer sê het (of sou as ek een gehad het).							
9	Die wêreld sal ’n beter plek wees as mense ophou om so baie tyd aan die versorging van hul troeteldiere te spandeer en in plaas daarvan meer begin omgee vir ander mense.							
10	Ek hou daarvan om diere met my hand te voer.							
11	Ek is lief vir troeteldiere.							
12	Diere hoort in die natuur of in dieretuine, maar nie in die huis nie.							
13	As jy troeteldiere in die huis aanhou kan jy baie skade aan die meubels verwag.							
14	Ek hou van troeteldiere in die huis.							
15	Troeteldiere is pret maar om een aan te hou, is nie die moeite werd nie.							
16	Ek praat dikwels met my troeteldiere (of sou as ek een gehad het).							
17	Ek haat diere.							
18	’n Mens behoort die troeteldiere in jou huis met net soveel respek te behandel as wat jy ’n menslike lid van jou gesin sou behandel.							

Appendix K: Owner-Pet Relationship Scale- Modified (OPRS-M)

The following statements indicate your attachment to your dog. Choose any of the options that best describes your attachment to your dog with 1= *strongly disagree* and 4= *strongly agree.* Remember there are no correct or incorrect answers.

At statement 15 you must choose either 0= *none of the options (a,b,c) present;* 1= *one of the options present*; 2= *two of the options present*; 3= *all three of the options present.*

		Strongly disagree 1	2	3	Strongly agree 4
1	My dog enjoys my company				
2	My dog is a member of my family				
3	I love my dog				
4	My dog helps me get through rough times				
5	My dog relies on me for love and care				
6	I have got to know other people through having this dog				
7	My dog gives me a reason to get up in the morning				
8	I think about my pet when it is not with me				
9	I do not like leaving my dog in someone else's care when I travel				
10	My dog is more loyal to me than the people in my life.				
11	I want to take my dog along when I go to visit friends or relatives				
12	My dog knows when I am upset and tries to comfort me				
13	My feelings toward other people are affected by how they react to my dog				
14	Dogs should have the same rights and privileges as family members				
15	I have a photo of my dog in my a) purse or wallet, b) cellphone, or c) on display in my office or home	0 of the options	1 of the options	2 of the options	All of the options

Appendix L: Eienaar-Troeteldier Verhoudingskaal-Gewysig (ETV-G)

Die volgende stellings dui op jou gehegtheid teenoor jou hond. Kies enige van die opsies wat jou gehegtheid teenoor jou hond die beste beskryf met 1= *stem glad nie saam nie* en 4=*Stem heeltemal saam*. Onthou daar is geen regte of verkeerde antwoord nie.

By vraag 15 moet jy 'n keuse maak tussen 0=*geen van die opsies (a, b, c) teenwoordig*; 1=*een van die opsies teenwoordig*; 2=*twee van die opsies teenwoordig*; 3=*al drie van die opsies teenwoordig*

		Stem glad nie saam nie 1	2	3	Stem heeltemal saam 4
1	My hond geniet my teenwoordigheid.				
2	My hond is 'n lid van my gesin.				
3	Ek is lief vir my hond.				
4	My hond help my deur moeilike tye.				
5	My hond maak op my staat vir liefde en sorg.				
6	Ek het ander mense leer ken omdat ek hierdie hond het.				

		Stem glad nie saam nie 1	 2	 3	Stem heeltemal saam 4
7	My hond gee my ’n rede om soggens op te staan.				
8	Ek dink aan my troeteldier as hy nie by my is nie.				
9	Ek hou nie daarvan om my hond in iemand anders se sorg te laat as ek weggaan nie.				
10	My hond is meer lojaal aan my as die mense in my lewe.				
11	Ek wil my hond saamneem as ek by vriende of familie gaan kuier.				
12	My hond weet as ek ontsteld is, en probeer my troos.				
13	Hoe ek oor ander mense voel word beïnvloed deur die manier waarop hulle teenoor my hond reageer.				
14	Honde behoort dieselfde regte en voorregte as gesinslede te hê.				
15	Ek het ’n foto van my hond in my a) handsak of beursie, b) selfoon, of c) in my kantoor of huis.	0 opsies	1 opsie	2 opsies	3 opsies

Appendix M : Lexington Attachment to Pets Scale (LAPS)

The following brief statements are about your favourite pet. Please select the option that best describes how you feel about each statement.
4= *strongly agree*, 3=*somewhat agree*, 2=*somewhat disagree* and 1=*strongly disgaree*

		Strongly agree 4	Somewhat agree 3	Somewhat disagree 2	Strongly disgaree 1
1	My pet means more to me than any of my friends.				
2	Quite often I confide in my pet.				
3	I believe pets should have the same rights and privileges as family members.				
4	I believe my pet is my best friend.				
5	Quite often my feelings toward people are affected by the way they react to my pet.				
6	I love my pet because he/she is more loyal to me than most people in my life.				
7	I enjoy showing other people pictures of my pet				
8	I think my pet is just a pet.				
9	I love my pet because it never judges me.				
10	My pet knows when I am feeling bad.				
11	I often talk to other people about my pet.				
12	M y pet understands me.				
13	I believe that loving my pet helps me stay healthy.				
14	Pets deserve as much respect as humans do.				
15	My pet and I have a very close relationship.				

		Strongly agree 4	Somewhat agree 3	Somewhat disagree 2	Strongly disgaree 1
16	I would do almost anything to take care of my pet				
17	I play with my pet quite often.				
18	I consider my pet to be a great companion.				
19	My pet makes me happy.				
20	I feel that my pet is a part of my family.				
21	I am not very attached to my pet.				
22	Owning a pet adds to my happiness.				
23	I consider my pet to be a friend.				

Appendix N: Lexington Skaal vir Gehegtheid aan Troeteldiere (LSGT)

Die volgende stellings handel oor jou troeteldier. Kies asseblief die opsie wat die beste beskryf hoe jy voel oor elkeen van die stellings.

1= *Stem beslis saam*, 2= *Stem ietwat* saam, 3= *Stem ietwat nie saam nie* en 4= *Verskil sterk.*

		Stem sterk saam 4	Stem ietwat saam 3	Stem ietwat nie saam nie 2	Verskil sterk 1
1	My troeteldier beteken vir my meer as enige van my vriende.				
2	Ek vertel dikswels my harts geheime vir my troeteldier.				
3	Ek glo troeteldiere behoort dieselfde regte en voorregte as gesinslede te hê.				
4	Ek glo my troeteldier is my beste vriend.				
5	My gevoelens oor mense word dikwels beïnvloed deur hulle reaksies of my troeteldier.				
6	Ek is lief vir my troeteldier want hy/sy is meer lojaal aan my as die meeste mense in my lewe.				
7	Ek geniet dit om fotos van my troeteldier vir ander mense te wys.				
8	Ek dink my troeteldier is net ‘n troeteldier.				
9	Ek is lief vir my troeteldier want hy oordeel my nooit.				
10	My troeteldier weet wanneer ek sleg voel.				
11	Ek praat dikwels met ander mense oor my troeteldier.				
12	My troeteldier verstaan my.				
13	Ek glo om vir my troeteldier lief te wees help my om gesond te bly.				
14	Troeteldiere verdien net soveel respek as mense.				

		Stem sterk saam 4	Stem ietwat saam 3	Stem ietwat nie saam nie 2	Verskil sterk 1
15	Ek en my troeteldier het ’n baie hegte verhouding.				
16	Ek sal byna enige iets doen om vir my troeteldier te sorg.				
17	Ek speel heel dikwels met my troeteldier.				
18	Ek beskou my troeteldier as ’n wonderlike maat.				
19	My troeteldier laat my gelukkig voel.				
20	Ek voel my troeteldier is deel van my gesin.				
21	Ek is nie baie geheg aan my troeteldier nie.				
22	Om ’n troeteldier te hê dra by tot my geluk.				
23	Ek beskou my troeteldier as ’n vriend.				

Appendix O: Text Template for text message / Facebook / Social Media/email Invitation.

English: Dear friend, I am conducting research on the attachment and attitudes of South African past and present pet owners towards their pets. If you would like to take part in this study please contact me via email at petssa2016@gmail.com or in a private message.

Afrikaans: Beste vriend, Ek is besig met ’n studie wat die gehegtheid en houding teenoor troeteldiere van Suid-Afrikaanse troeteldier eienaars meet. Indien jy graag sou wil deelneem hieraan, kontak my gerus per e-pos by petssa2016@gmail.com of in ’n private boodskap.