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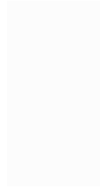
Attribution Statement

The content in this thesis was developed by the Candidate with advice from their supervisory panel. The following individuals contributed to the thesis.

Contributor	Contribution (%)	Concept Development	Data Collection	Data Analyses	Drafting of Chapters
Tara Amin	80	X	X	X	X
Grant Cullen	10	X	X	X	X
Vita Akstinaite	10	X	X	X	X

Contribution indicates the total involvement the student and other contributors (supervisors etc.) have had in the creation of the thesis. Placing an 'X' in the remaining boxes indicates which aspect(s) of the thesis each individual engaged in.

By signing this document, the Candidate and Principal Supervisor acknowledge that the above information is accurate and has been agreed to by all other contributors.



Abstract

In recent years there has been an increase in the expenditure by owners on their pets' care. There is currently limited knowledge as to what motivates pet owners to spend money on veterinary care in Australia. In this study, the spending habits of Australian pet owners and motivations for the increase in spending were investigated to determine if there was a link between behaviour that could signify a close bond between the pet and the owner and spending on veterinary care. To address these themes a survey was design to determine the demographics of owners, their pets, their attachment to their pet and their spending on veterinary care.

Of the 104 pet owners that responded to this study most respondents were owners of dogs (80) while the remainder owned cats (24). It was found that pet owners were motivated to spend more on their pets based on the severity of their pet's condition and attachment behaviours they displayed towards their pet. This research also revealed that many respondents view their pets as their friends or family members. Interestingly, pet insurance status was not found to affect the spending habits of owners however, it shows that the motivation to spend seems to be driven predominately by female pet owners. This study presents the motivating factors behind veterinary expenditure through the lens of Australian pet owners. It also contributes to the continued study of the relationship between attachment theory and pet ownership further supporting the concept that attachment theory can be applied to people and their pets. The research also provides firsthand feedback provided by Australian pet owners about the financial impacts of pet ownership.

Thesis Declaration

I Tara Amin, verify that in submitting this thesis; the thesis is my own account of the research conducted by me, except where other sources are fully acknowledged in the appropriate format, the extent to which the work of others has been used is documented by a percent allocation of work and signed by myself and my Principal Supervisor, the thesis contains as its main content work which has not been previously submitted for a degree at any university, the University supplied plagiarism software has been used to ensure the work is of the appropriate standard to send for examination, any editing and proof-reading by professional editors comply with the standards set out on the Graduate Research School website, and that all necessary ethics and safety approvals were obtained, including their relevant approval or permit numbers, as appropriate.

Signed 

Date: 12/06/2022

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1.0 Introduction

In modern society, pet ownership has become a significant part of day-to-day life. According to a recent survey by Animal Medicines Australia (2019), 90% of Australians have had a pet at some point in their lives. Moreover, as pet ownership grows throughout Australia, spending on pets also grows. The sheer volume of companionship animals creates a tremendous national economic market for pets in Australia and it has been shown that Australian pet owners have spent over AUD 13 billion on their pets' care in the year 2019 (Animal Medicines Australia, 2019). This significant amount of spending may be explained by the fact that humans and their animal-companions have evolved symbiotically and fostered mutually beneficial relationships for thousands of years (Russell, 2011). The bond between humans and their domesticated pets has further evolved into a relationship where pets are now very commonly being looked upon as substitutes for children or other family members (Chen et al., 2012). This concept could then explain the reason for this spending even further.

As pet ownership increases, so does the need for research and technology surrounding pet care. As Animal Medicines Australia (2019) describes, 63% of dog owners and 60% of cat owners consider their pets to be a part of their family, holding significant attachment to their pet and experiencing a deep sense of grief if their pet is missing or dies. With this increased demand and investment in pet wellbeing, veterinarians are now able to offer better and more advanced pet care to the public due to advancements in science. However, this investment comes at a cost. Kipperman et al. (2017) investigated the cost of pet care from a veterinary perspective and how economic limitations can significantly impact the level of care that is provided to clients. This research found that veterinarians believed that more awareness about the potential costs of pet care would be favourable for owners. If pet owners had more knowledge and transparency about costs, they would be able to make more informed decisions on whether they could financially support a pet if it fell ill or had an accident that required veterinary care. Owners would also be able to prepare for these costs by taking out pet

insurance. It was also concluded that this greater awareness and education of owners would allow for the best possible treatment of their animals (Kipperman et al., 2017).

In addition to this, Boller et al. (2020) conducted a study to investigate why pet owners elected for economic euthanasia in certain emergency veterinary situations. It was found that age and pet insurance were the primary motivating factors behind selecting for euthanasia in this emergency circumstance (see Section 2.2.4 for further detail). Similar to the Kipperman et al. (2017) study, Boller et al. (2020) found that the level of care that is provided to pets is significantly limited by the owner's financial situation and that spending on veterinary care in emergency situations is very much a question of finances above anything else. These decisions that are being made bear both a financial and emotional cost. There is a loss of revenue to veterinary centres when life-saving veterinary care cannot be provided along with the emotional toll taken by both the owner and the clinician when hard decisions must be made due to the pet owner's financial circumstances.

For example, a report conducted by the RSPCA (2019) shows that in the 2018-2019 financial year, there were 124,146 animals surrendered to the shelter in Australia, a total of 51,170 cats and 33,863 dogs, the remainder consisting of various other pets. While the report does not disclose the reason for the surrender of these pets, it is possible that costs, time, responsibility, and commitment might have been one of the reasons for abandoning these pets. As discussed in Section 2.4, costs seem to be the primary motivating factor when it comes to deciding to spend money on pets (Boller et al, 2020). To further investigate the costs associated with pet ownership, this research aims to explore the reasons and motivating factors behind spending significant amounts of money on pets and whether the type of medical treatment required influences the pet owner's choice to spend money on veterinary care. Through understanding the economic value of pets, the present research will also provide useful information to current and future pet owners. Such information would allow individuals to make informed decisions about purchasing or adopting a pet into their family.

This study aims to address the lack of information pertaining to pet ownership costs and gain a more profound, comprehensive understanding of the relationships between pets and their owners and how this affects the cost of ownership. There has however been similar research into pet owner spending in Taiwan and surrounding parts of Asia by Chen et al. (2012) and there has also been similar research into the financial side of veterinary care and the impact financial communications with pet owners have on veterinarians by Kipperman et al. (2017). Boller et al. (2020) reported on the impact that pet insurance has on pet owner spending on gastric dilatation and volvulus treatment in Australia. These studies provided a basis for “the economy of pets”.

Due to the multitude of stakeholders in the pet industry, the benefits this research contributes have the potential to affect many individuals and organisations, including veterinary care professionals, pet owners, government bodies and animal-related organisations, such as those offering pet insurance. There is an ongoing public perception that pets benefit one’s physical and emotional well-being (Beetz, 2012; Shiloh, 2013). It could be speculated that this physical and emotional impact that pets have on their owners would result in a motivation to spend and spend significantly should their pets fall ill, further investigation into whether this is the case is needed. Government and various animal-related Australian organisations such as Pet Stock, RSPCA, Cat Haven and other adoption agencies, along with breeders, would find this study insightful. This research provides useful information and a unique perspective into the investment of pet care and the people behind it. In summary, the ‘economy of pets’ is a significant topic, and this project aims to contribute to the creation of knowledge in this field by reporting the key factors that influence pet owners to spend money on their pets in Australia. To the best of the author’s knowledge, such research has not been conducted in Australia.

2.0 Literature Review

This literature review has been separated into four sections: Section 2.1 discusses the factors that led to humans and animals fostering their first known relationships and their subsequent domestication; Section 2.2 examines the benefits of pet ownership to humans; Attachment theory and how it applies to human-animal relationships are discussed in Section 2.3; finally, Section 2.4 reviews the cost of pet ownership in society today.

The aim of this literature review is to explore pet ownership and its costs in Australia while focussing on understanding the underlying reasons why people now see their pets as being lifelong companions or members of the family and furthermore, why individuals are inclined to spend so heavily on pets. Headey (2003) reviewed several research studies considering the benefits of pet ownership. Overall, pet ownership is seen as beneficial to people mentally and emotionally, and is linked to various positive health outcomes, including improved mental wellbeing, reduced stress, lowered levels of blood pressure and good cardiovascular health, as well as encouraging good health habits such as regular exercise (Headey, 2003).

As discussed in Section 1.1, Australian pet owners have spent over AUD 13 billion on their pets' care in the year 2019 (Animal Medicines Australia, 2019). In response to this high level of spending on veterinary care and the demand for high-quality veterinary care, the veterinary industry has increased investment in research and the specialisation of veterinarians to better care for our pets (Kipperman et al., 2017). Commonly, pet insurance has been seen as a requirement for owning a pet due to the high costs that are now associated with pet ownership (Animal Medicines Australia, 2019).

2.1 A History of Human-Animal Interactions

To understand and explain the present, it can often be useful to look to the past. The renowned biologist, naturalist, evolution theorist Edward O. Wilson proposed “the biophilia hypothesis” in 1984. This hypothesis postulates that humans need companionship and close relationships with other species

and are innately attracted to bond with them. Frumpkin (2001) further explores the idea that humans are biologically programmed to be drawn to, and bond with, animal species and shows that human to animal relationships have been woven into our ethology thousands of years ago. These human and animal relationships can be observed from the artwork and illustrations produced by our ancestors around this time, which were heavily influenced by animals and the natural world.

Primate evolution began over 65 million years ago, and our human ancestors began to create the first known domestic relationships with animals around 15,000 years ago, on the cusp of the Neolithic period. The first known accounts of "animal keeping" by human beings were during the Neolithic period, which later evolved and developed further to the point where humans bred animals for their advantage between 600 B.C. - 400 A.D. (Russell, 2011). Clutton-Brock (1994) suggested that wild dogs/wolves and humans were seen to be major competitors during the Paleolithic period. Naturally wolves and humans formed a mutually beneficial relationship in which humans utilized 'tame' wolves during their hunts and the wolves would also benefit from this by having access to food and shelter. Those who fostered close or 'domestic' relationships with animals had significant survival advantages because animals were able to smell water, find food and shelter and provide warning of a threat nearby (Frumpkin, 2001). Russell (2011) highlights a significant difference between taming wild animals and true domestication. Domestication of animals involves a behavioural and biological change that lasts beyond the life of a single animal.

Russell (2011) reported that canines were the first known domesticated animals to exist more than 32 000 years before the present time and that this companionship was initially fostered in Central Europe. Frumpkin (2001) also argues that the biophilia hypothesis can explain why humans are so willing to go out of their way to help animals in need. Russell (2011) also discusses how people have evolved symbiotically in a mutually beneficial relationship through the keeping and domestication of animals. Because of this, traits that were favourable to both species were passed on through evolution, further

strengthening the bond between humans and animals. Throughout the course of time human beings have shifted their perception of domesticated animals. Once, people looked upon animals as an aid and a means to survival. Now, more commonly, individuals look upon them as lifelong companions, members of the family or, for some, to aid in their work or aid in their disability.

Because of this change in the way that pets play a role in people's lives, it is natural to see the health and wellbeing of pets in the same way as one would see another family member or friend. The emotional connection that humans have with their domesticated animals is ever-growing and has played a role in the evolution of our species. For example, Weave (2019) has recently reported that of millennial pet owners in the United States, 82% of the 532 millennials (born between c.1981 and c.1996) that were surveyed would risk their own life for the life of their pet. In addition, 92% of millennials hold their pet's health in the same esteem as their own (Weave, 2019). This fondness for pets and the willingness to sacrifice one's own self for the life of their pet may be due to the thousands of years of cohabitation and symbiotic evolution. Such a notion is supported by Russell (2011), who discusses how humans expend a lot of time, effort, and money to modify their lives in significant ways to accommodate their pet/companion animal.

2.2 Benefits of Pet Ownership

Research conducted around pet ownership reinforces the idea that humans have evolved to desire the companionship of animals (Headey, 2003). Because of one's innate, instinctual habit of seeking out and forming relationships with other animals, it is understandable to think that pet ownership will come with benefits. Saunders (2017) reports that 62% of Australians live with a pet. The finding by Saunders (2017) is largely consistent with the Animal Medicines Australia (2019) who reported that 90% of Australians have owned a pet at some point in their life, and two thirds (66%) of households currently own a pet. These reports also show that Australia has one of the highest pet ownership rates globally, with the country being home to over 29 million pets. For comparison

purposes, the American Pet Products Association (2019) found that in the year 2019, 67% of U.S households owned a pet, a proportion similar to Australia. In the U.S this equates to about 84.9 million homes, whereas, in Hong Kong, the ownership rate is just 36%. Statistics from Animal Medicines Australia (2019) also show that dogs and cats are the most common animals, making up 40% and 27% of the households that own pets. As discussed in Section 2.1, in 2020, pets are seen much differently than they once were, and there is a common belief that owning a pet is beneficial to both one's physical and mental wellbeing (Animal Medicines Australia, 2019).

To further explain the benefits of the pet ownership mentioned above, Saunders (2017) examined a group of individuals who had never previously owned a pet. As part of the study, a group was given a pet for ten months, from this point the behaviour and physical health of the participants were monitored over this period. The experiment resulted in the owners showing both physical and mental health improvements, experiencing lower symptoms of anxiety and depression, and owners were seen to participate in significantly more physical activity (Serpell, 1991). However, one limitation of this study is that these individuals may have been aware of the objective of their monitoring, which may have introduced a confirmation bias. Adding to the evidence that animal companionship has positive benefits to human wellbeing, Shiloh (2003) found that anxiety and stress in humans have been significantly reduced when in the presence of an animal.

In the Shiloh (2003) study, participants were exposed to a stressful situation, that being in the presence of a tarantula spider/holding the spider in a laboratory. These participants were then assigned to groups who would be either petting a rabbit, a turtle, a toy rabbit or a toy turtle or a control group with no animal/toy. Shiloh (2003) used two questionnaires to assess and measure the level of anxiety and their attitudes towards the animal. From the questionnaire, it was shown that the levels of anxiety and stress experienced by those petting an animal were significantly less than those petting an animal those who were given nothing to pet. Headey (2003) also notes that multiple American studies show

positive effects when observing pet owners and heart disease; however, contrasting this Heady (2003) was unable to find a conclusive relation between pets and anxiety when the blood pressure of participants was used to measure the level of anxiety experienced.

Shiloh (2003) also reported a reduction in stress and anxiety in numerous practical applications, including using pets in workplaces or treating mental health patients. This theory that animals can reduce the state of stress and anxiety experienced by people is further supported by Beetz (2012), who measured a wide array of human functions such as heart rate, blood pressure, social behaviour, stress, mood, and anxiety. In addition to this, Headey (2003) concluded that pets do have a positive effect on our health; however, specifics of this positive effect are not clear, and concluded that further exploration of this topic is needed. Similar research by Marr et al. (2000) found that psychiatric inpatients who participated in dog-assisted therapy showed a significant improvement in their quality of life in relation to social interactions, compared to an alternative therapy group that did not involve animals. Patients in this study demonstrated increased smiling, sociability towards other patients, helpfulness toward others, and general responsiveness. Beetz (2012) findings were much more conclusive and revealed that the bodily functions (heart rate, blood pressure, social behaviour, stress, mood, and anxiety) showed a reduction in negative behaviour and emotions when the participant was in the presence of a pet. Moreover, Beetz (2012) found that animals can have a significantly positive impact on human functions and measures of behaviour such as empathy, aggression, trust, and providing sensory relief to those experiencing stress.

Beetz (2012) hypothesised that the positive effect on human functions and behaviour was due to the human body producing the hormone oxytocin, the so-called 'happiness hormone' (Ishak et al., 2011) when interacting with animals. According to a study by Olivier et al. (2011), oxytocin has long been linked with a variety of positive health outcomes. The above-mentioned results from the studies linking animal contact with positive benefits contrast with Heady (2003) findings, which found

insufficient evidence to conclude that pets provide measurable benefits to their human owners. It was reported by Serpell (2003) that the absence of social support structures can be detrimental to human health, both mental and physical and that pets can provide a sense of support to their owners. Saunders (2017) argues that the long-term benefits of pet ownership remain inconclusive due to the short timespan covered by these studies.

The Australian Bureau of Statistics (2018) reported that 15% of Australians between the ages of 16 to 85 had experienced an affective disorder (i.e., anxiety, depression, PTSD) at some point in their lifetime. The survey by Animal Medicines Australia (2019) also reflects people associating pet ownership with a better state of being, particularly relating to mental health but also to physical health benefits. As this equates to approximately 2.83 million people, it can be speculated that the increase in our affection towards our pets would be beneficial to many people in our community, particularly those who may be experiencing emotional turmoil. As further discussed in Section 2.3 below, pets can provide a sense of relief to individuals currently experiencing distress (Zilcha-Mano et al., 2011). According to Animal Medicines Australia (2019), the primary motivation for owning a pet was the affection, companionship, and loyalty that owners believed came from pet ownership. Moreover, many owners hold the opinion that pet ownership positively affects their mental health (Animal Medicines Australia 2019).

Interestingly, the Animal Medicines Australia (2019) survey also explores the reasons behind owning different types of pets. The reasons for owning dogs, cats, other small mammals, and birds were companionship and affection. In contrast, relaxation was the rationale for the ownership of fish and reptiles. Small mammals were also considered to be an important developmental tool for children, teaching them the concept of responsibility. Additionally, from this survey, 88% of pet owners described their experience of pet ownership as predominantly positive. The 3% of owners who cited a negative pet ownership experience attributed this to the cost of pet care, maintenance, cleaning, lifestyle limitations

such as restricted travel, and lastly, the grief they experienced when their pet passed away (Animal Medicines Australia, 2019).

Research conducted by Chur-Hansen et al. (2008) reported similar reasons for the negative implications of owning a pet. Participants in this study named several reasons for not owning a pet, including maintenance, accommodation regulations and lifestyle limitations. Additionally, participants cited their own health limitations, the grief if the pet passed away, and the issue of what would happen to the pet if they could no longer care for it as reasons for not owning a pet (Chur-Hansen et al., 2008). While companionship is one of the main reasons discussed by Animal Medicines Australia (2019) as to the benefit of owning an animal, the participants in the Chur-Hansen et al. (2008) study said that they were quite content with the companionship they feel with their children and grandchildren.

2.3 Attachment Theory

In the 1970's, Ainsworth et al. (1978) used the concept of attachment to conceptualise child-parent relationships, where the child is dependent and in need of care and attention, with the parent playing the role of an attachment figure. Building on this theory, Bowlby (2005) claimed that the concept of attachment can be relevant to all stages throughout the human lifespan and that this theory could apply to many different human relationship structures. Research by Bowlby (2005) identified four prerequisites for an attachment relationship and argued that a form of attachment would exist if these prerequisites were fulfilled. These prerequisites being proximity seeking, safe-haven, secure base, and separation distress. In the research conducted by Ainsworth et al. (1978), attachment figures involve a human relationship with the ability to aid and have discussions, whereas a pet does not have the ability to do so. Additionally, Ainsworth et al. (1978) argue that the attachment figure is one of care and is regarded by the dependant as being more physically and mentally adept.

Bowlby (2005) takes an ethological approach (this being the study of animal behaviour) to attachment, and reports that the attachment figure can be a figure of care. However, the attachment

may also be mutually dependent, as in the case of many adult friendships or romantic relationships. Bowlby (2005) further argues that proximity-seeking behaviours were a result of evolution to ensure there is physical and emotional closeness to attachment figures in times of need. This behaviour serves as a source of security, comfort and enhanced physical and emotional wellbeing (Sabel, 2000). One study conducted around anthropomorphism (the attribution of human emotions, traits or behaviour to non-humans) shows that 70% of pet owners consider their pet to be a substitute for children, friends or family (Serpell, 2003). Pets substituting as human children is shown to be something that has existed throughout the ages and across many various cultures. Russell (2011) reports that the Indigenous Amazonian tribe the Achuar, consider the dogs in their tribe as quasi-human, caring for them when sick with traditional herbs and healing medicines, involving them in their rituals and ceremonies and feeding them home cooked meals similar to how they care for their own children. Hamilton (1972) also discusses how some Australian Aboriginal groups also kept pet dogs as a substitute for children.

Zilcha-Mano et al. (2011) argues that in both research and real-world scenarios, these concepts are confirmed when humans and their pets are observed enjoying the company of one another and actively seeking out this close interaction. The research explores how anxious or avoidant attachment relationships in human-to-human relationships can also exist in human to pet relationships. Human beings are comforted by their pets and are provided with relief, affection, and support, particularly in times of great stress or require a figure of support to rely upon. In these cases, the pet provides support for the owner. This close relationship between the two allows for self-development for the person experiencing that support provided by their pet. When a person feels secure, they are more likely to experience an increase of exploration and risk-taking behaviours outside of their usual comfort zone, which promotes their development.

Additionally, when a pet is lost, humans experience some degree of grief and sadness - akin to how they would feel if they lost a member of their family. In a study undertaken by Brockman et al.

(2008), owners are willing to pay for their pet's expenses because they perceive the pet to be the same as a member of their family. Holak (2008) also found that in addition to the above, many owners participated in festive or religious ceremonies for their pets similar to those held for their human counterparts as they assigned the same value to their pets as they did themselves.

2.4 Cost of Pet Care

Animal Medicines Australia (2019) has produced a comprehensive report that summarises the costs of pet care in Australia and the demographics of pet owners. According to this survey, in 2019, Australians have, on average, spent AUD13 billion on their pets, which is significantly less than the United States, where AUD95.7 billion was spent during 2019 (APPA, 2019). However, for a comparison purpose, on a per capita basis, Australians spend 75% more than Americans (Worldometer, 2020). Animal Medicines Australia (2019) reported the three highest categories of expenditure were food (AUD3.9 billion), veterinary services (AUD2.6 billion) and pet healthcare products (AUD1.4 billion). These categories encapsulated expenditure on dogs, cats, fish, birds, small mammals, and reptiles in the year 2019. Although the research conducted by Animal Medicines Australia (2019) is very broad, it provides a lot of useful statistical information relating to pet cost breakdown such as clipping/grooming, pet insurance, alternative treatments, food, veterinary services, transport, products, and accessories, boarding and care and miscellaneous.

Chen et al. (2012) reported how pet-related products and services such as grooming, pet products, boarding and veterinary care, to name a few, have grown on a global scale to ten times the size it was in the late 1990s. The report by Animal Medicines Australia (2019) detailed that the veterinary care expenditure category experienced the largest growth since 2016, with a 0.4 billion increase in the three-year period. Pet healthcare products and pet accessories remained relatively static, which Animal Medicines Australia (2019) attributes to the uptick in online pet care retailers setting their prices to be very competitive. Dog food unsurprisingly accounts for the highest percentage of spend on

pet food sitting at 57% of total spend; this is followed closely by cat food accounting for 32% of total spend. Such a finding is not surprising given that dogs and cats make up the largest amount of the pet population in Australia, 39.9% and 27%, respectively (Animal Medicines Australia, 2019).

2.4.1 Cost of Acquiring and Caring for a Pet

The breakdown of the cost of pet care shows that the cost of owning a pet commences when the pet is first acquired. The average cost to acquire a dog is approximately AUD627, and the cost of a cat is AUD308 (Animal Medicines Australia, 2019). This cost can vary depending on where the pet was purchased from a pet refuge, a neighbour, or a reputable breeder. Moreover, the number of dog owners who spent more than AUD1000 purchasing their dog has increased from 9% to 15% since the year 2016 (Animal Medicines Australia, 2019). Similar trends of increasing acquisition cost can be seen in the purchase of cats, as there has been an increase in the cost of purchasing a cat from 5% and 9% since 2016. Moreover, both cats and dogs purchased from a breeder can cost over four times the amount of those purchased from a shelter (Animal Medicines Australia, 2019). It can be speculated that the increase in spending to obtain a pet is from the current popular trend to own a “designer” breed such as French bulldogs, and dachshunds, amongst others. These animals are much more likely to come from a breeder and, therefore, more likely to be significantly more expensive to purchase than a rescue animal. For example, since 2016, there has been an increase in “designer” breed dogs, increasing from 8% to 14% of dogs in Australia. Although there is no comparison data provided for “designer” cats, it has been reported that a quarter of all cats in Australia are designer breeds, while the remainder is unknown breeds acquired from shelters (Animal Medicines Australia, 2019).

A study conducted by Chen et al. (2012) examines Taiwanese pet owners and discusses both the owners' economic consumption and the behaviour that owners displayed towards their pet. It has been found that individual Taiwanese owners spend between USD9000 and USD14500 (between AUD12800 and AUD20700 equivalent) on their dogs over the life of the pet, 40% of this expenditure is said to be on

veterinary care. This expenditure can be compared to the findings by Animal Medicines Australia (2019) who reported that the national spending on veterinary care in 2019 was 20%, the highest percentage of expenditure on pet care was food sitting at 30%. This difference in Australian and Taiwanese spending habits could be due to cultural reasons. During recent years Taiwan has ranked as one of the world's lowest birth rates. Chen et al. (2012) believes that the reason for the increase in pet care consumption can be linked to the declining birth rates and the growing aging population of Taiwan where pets are being considered as substitutes for children.

In view of Serpell's (2003) research into animals possessing human traits and characteristics, anthropomorphism supports the idea that the low birth rate in Taiwan is an influencing factor when investigating the high spending on pets. Chen et al. (2012) argues that due to similar cultural values and similar trends in relation to the population, this study can be used to analyse many cities in the People's Republic of China. The attachment has been shown as one of the key variables in many various anthrozoology studies, including the research conducted by Chen et al. (2012). However, a thorough analysis is needed to investigate whether there is a link between the pet owner's demographics and expenditure on veterinary care for their pets and what factors motivate a pet owner to do so. To date, there is also no research surrounding the role of attachment and the choice of the types of veterinary care that owners are willing to spend money on. In addition, the research conducted to date in relation to the measurable benefits of owning a pet is conflicting. While some research found pets provide considerable mental, emotional and physical benefits to their owners (Bowlby, 2005), other studies do not support such findings or have severe limitations that compromise their conclusions (Saunders, 2017). Therefore, a comprehensive understanding of the factors motivating spending on pet medical care has not been achieved.

2.4.2 Cost of Veterinary Care

The cost of obtaining a pet is seemingly the least expensive part of being a pet owner. The high cost of pet care is commonly discussed and debated when it comes to the veterinary treatment of pets (Animal Medicines Australia, 2019). A survey conducted by Limb (2019) showed that millions of pets across the UK were not being vaccinated in line with standard veterinary advice leaving animals susceptible to preventable diseases. As such, when pets are not adequately protected from these preventable diseases by being vaccinated, the financial and emotional cost of treating/losing the animal must be borne by the owner. In the study conducted by Boller et al. (2020), it is discussed how the decisions that are made by pet owners in relation to the medical treatment of their pets are very much financially motivated. These motivations were found to be specific to emergency treatment situations. Limb (2019) reported that from 2016, the proportion of dogs, cats and rabbits receiving their early vaccinations has fallen from 84% down to 66% between 2016 and 2019. This report also shows that one third of these pets are not receiving regular “booster” vaccinations or antibody testing to ensure they are adequately protected against common diseases. Other experts predict surges in feline and canine diseases, which are preventable through vaccination. Limb (2019) reports 17% of pet owners who chose not to vaccinate their animals have cited cost constraints. Many veterinarians and the animal welfare organisation PDSA (People's Dispensary for Sick Animals) have responded to these results by urging communities to vaccinate their animals and by highlighting the importance of doing so (Limb, 2019).

As discussed above in Section 2.4.1, acquiring a pet can be very costly, however the cost of the pet's care can be even more expensive. Because treatment for pets can be so inflated, it is not uncommon for those owners to consider other options. The most common consideration amongst owners when the cost of treating a pet is deemed unaffordable is the decision to euthanise a pet. Dunn (2006) found that one in three US pet owners would seriously consider euthanasia if the cost of the veterinary treatment was above USD500 (AUD700). For this cost, proper diagnostic testing would not be

covered, and the cost of any surgical or emergency treatment would exceed this figure significantly. Boller et al. (2020) investigated the rate of pre-surgical euthanasia for dogs with gastric dilatation-volvulus. It was found that the rate of euthanasia was only 10% when the dog was insured but 37% in uninsured dogs. Age was also found to be a contributing factor when it came to the decision to euthanise the animal.

Boller et al. (2020) consider the economic reasons of euthanasia that impact dogs that experience the emergency condition gastric dilatation-volvulus (GDV), and how pet insurance influences the decisions made in relation to this. GDV is a life-threatening condition that affects multiple body systems in dogs and typically involves emergency surgical intervention. The success rates of surgical treatment for this condition have been reported to be between 79% and 90% (Mackenzie et al., 2010; O'Neill et al., 2017). However, the high cost of surgical treatment of this disease causes owners to choose pre-surgical euthanasia. This causes significant emotional turmoil and moral conflict for both the owner of the pet and the veterinarian who is caring for the animal (Bussolari et al., 2018; Kipperman et al., 2018; Kondrup et al., 2016; Moses et al., 2018). Boller et al. (2020) reported that 77% of dogs who did not survive, died before surgery due to the decision made by the owner to euthanise the dog. The remaining non-survivors were recorded as dying during or after the surgery itself via complications or were euthanised during the surgery.

In a survey conducted by American Veterinary Medical Association (2019), it was reported that approximately 30% of pets do not visit their veterinarian each year. The lack of regular veterinary visits equates to an economic value of approximately 7 billion USD (9.9 billion AUD) worth of veterinary care services that are not being provided. As such, not only does the health of many household pets suffer, but the future sustainability of the veterinary care industry relies on this (American Veterinary Medical Association, 2019). The reason for these owners not taking their pets to receive veterinary treatment was a matter of economic limitations. One possible way to address this issue is more awareness around

pet insurances as well as the methods of treatment being offered at both primary care clinics and referral practices. Due to the rising number of pet owners and the increasing cost of pet care, researchers are investigating more cost-effective methods of both diagnosing and treating pets (Sullivant et al., 2020). In the Sullivant et al. (2020) study, it has been found that in complex cases referral to specialist practices by the general practitioner veterinary is often required. However, this referral frequently bears a high cost to pet owners.

Sullivant et al. (2020) found that expense was the most common reason pet owners refused referral to a specialist. After this offer of referral was declined, the most prevalent outcome was euthanasia of the animal or unsuccessful treatment conducted by the general practice veterinarian. When studying the costs of veterinary care and the financial communications between practitioners and clients, Kipperman et al. (2017) found that 30% of veterinary specialists and 16% of general practising veterinarians believed that more education, awareness, and transparency about the costs of pet ownership would significantly decrease the frequency of economic euthanasia. Kipperman et al. (2017) suggested that and the higher proportion for referral/specialist veterinarians is because specialist treatments, such as oncological treatment, surgery or dermatology, cost significantly more than general practice care. This is supported by the findings from (Sullivant et al., 2020).

Kipperman et al. (2017) found 72% of those who responded to the survey in their study believed that veterinarians should be trained to discuss general future costs of pet care with their clients. In response to customers declining referral, Sullivant et al. (2020) investigated alternative methods to the provision of veterinary care and concluded that these approaches should be introduced into the veterinary curriculum to combat the need for pets to be referred to a specialist practice in the case of cost constrained clients. These approaches allow the use of patient signalment, history and clinical examination findings to narrow down the possible cause of the ailment, followed by simple, affordable, in-house diagnostics to allow further refinement. A limitation in this investigation is that the study

focused on one specialist area of treatment protocols, small animal internal medicine, the researchers acknowledge that the program that they have developed within small animal medicine has the potential to be expanded into other areas such as surgery, dermatology, and other areas of animal referral (Sullivant et al., 2020).

The survey conducted by Sullivant et al. (2020) found 57% of 1,122 veterinary practitioners reported that their ability to provide adequate medical care to their patients was heavily impacted by the owner's economic position and their financial limitations. Kipperman et al. (2017) concludes that there is limited education provided to veterinarians throughout their course of study to give them the appropriate tools and guidance to discuss the costs of pet care with pet owners. This hinders the veterinarian's ability to provide proper care to the animal as the owner is not properly informed about the current or future costs of care. Sullivant et al. (2020) solution to this issue is suggesting alternative methods of treatment and diagnosis which will mean that those who are experiencing financial limitations still be able to receive veterinary treatment and therefore veterinarians will be able to provide adequate care and not face the same issues when it comes to cost communication. Following the implementation of the alternative and more affordable methods of diagnosis Sullivant et al. (2020) found that half of the participating veterinarians have seen economic euthanasia rates halved, and 100% of the participants believed that the quality of life of their patients significantly improved. This provides a solution to the issue raised by Kipperman et al. (2017) regarding the pressure veterinarians face informing clients about unforeseen costs and subsequently, the inability to perform their jobs effectively due to cost constraints stemming from the lack of awareness surrounding the cost of pet care. Through this study on the costs associated with pet ownership, the present research aims to provide greater awareness on the '*economy of pets*', which in turn can improve the education provided to veterinarians either during their studies or once they enter the workforce.

2.4.3 Cost of Insurance

Dunn (2006) discusses how the high cost of diagnosis alone can be several thousands of dollars. Because of the high costs of diagnosis and the rising demand for quality and life-saving veterinary care, we have seen the rise in services such as pet insurance and third-party credit providers. The North American Pet Health Insurance Association (2019) reported that the adoption rate for pet insurance in the United States (US) has increased by 0.6% for dogs and 0.1% for cats since 2017. In a survey conducted by the American Veterinary Medical Association (2015), 65% of respondents confirmed that they had purchased pet insurance for their animal on the recommendation of their veterinarian. In addition to this, it was also found by the North American Pet Health Insurance Association (2019) that pet owners are more likely to purchase pet insurance if this was recommended to them by their veterinary provider. This is further supported by Sprinkle (2019), who reported that 70% of pet owners look to their veterinarian as their most trusted source of information when it comes to information and advice to do with pet care.

Similar trends can be seen across other developed economies. The Veterinary Record (2017), reported that a consumer intelligence spokesperson highlighted that the growing cost of pet insurance is simply due to the growing costs of pet care. Dunn (2006) found many pet insurance consumers see this as a financial investment rather than protection from any high future veterinary costs that they may incur, unexpectedly or unexpectedly. He also found that insured pets see their veterinarian 30% more often than uninsured pets, and the clients that do have pet insurance spend on average 42% more on veterinary treatment than clients who do not have pet insurance. The Veterinary Record (2017) research showed that most pet owners that participated in the research actually paid for their pet's treatment themselves, with 17% of owners claiming that their excess in insurance was too high and another 15% discovering that their chosen pet insurance did not cover the specific cost of their pet's treatment. Williams et al. (2020) found that of the dog owners observed, 67.6% were covered by pet insurance, this

investigation reported that nearly half of the dog owners observed participated in a preventative wellness care plan for their pet which would help to manage the costs of visits. Further to this, Boller et al. (2020) discusses that although pet insurance is beneficial to pet owners, it does not entirely remove all out-of-pocket expenses. In the research by Williams et al. (2020) it was concluded that having pet insurance did not affect the frequency of veterinary visits, however, the amount that owners spent at the visit was impacted. Owners who had pet insurance spent USD211 (AUD300) more per annum than owners who did not.

Boller et al. (2020) discusses how the development of modern technology has allowed for significant developments in more sophisticated treatments such as specialist surgeries, endoscopies, intensive care practices, dermatological services, and advanced imaging (computed tomography and magnetic resonance imaging). These treatments often come at a higher cost to consumers, for instance, a computed tomography (CT scan) can cost upwards of AUD2000. Consequently, expenses relating to pet insurance increase along with the costs of veterinary treatment. However, the modern and well-developed nature of these treatments or “packaging” of treatments will likely produce a far better outcome for the pet (The Veterinary Record, 2017). In the Kipperman et al. (2017), 82% of veterinary clinics in the study are seen to combat financial issues by having policies in place that allow for either internal payment plans or refer their clients onto an external credit provider, for instance, VetPay, Zippay or Afterpay. This is supported by Boller et al. (2020), who states that with veterinary treatment more generally, other financial interventions are often considered. These include payment plans, lower deposits required by clinics, external credit providers and preventative treatments such as prophylactic gastropexy (used to prevent GDV) which are far less costly than the emergency treatment required to treat the condition.

Williams et al. (2020) found that owners who had wellness/preventative plans with their veterinarian visited their practitioner 20% more than those who did not. This could be due to the nature

of “wellness” care plans as they are created to encourage pet owners to come in for preventative care visits such as vaccination, check-ups, worming, and flea treatment throughout the year (Williams et al., 2020). Kipperman et al. (2017) reported that pet insurance providers typically cover visits for things such as annual check-ups and vaccinations. These wellness plans are a proactive way to encourage owners to regularly take their pets to visit the veterinarian and allow veterinarians to provide preventative care and treat problems before they manifest into something costly. Boller et al. (2020) support this, discussing that preventative treatments, while still costly, allow pet owners to plan adequately how they will finance the cost of treatment rather than experiencing a sudden, unexpected expense that comes with life-threatening consequences to the pet (Boller et al., 2020). Furthermore, Kipperman et al. (2017) discusses that 84% of participants in the study believed that there should be an increased effort to improve client awareness and encourage owners to consider pet insurance to help offload financial burdens.

The Boller et al. (2020) study revealed that the choice to euthanise in cases of GDV was predominantly motivated by the financial costs of the treatment. Boller et al. (2020) also identified other considerations in this decision, such as the severity of the condition, any other underlying conditions the pet might have, but most prominently, the age of the pet was a very strong consideration. For example, if the dog was older, the owner would be more likely to euthanise the pet. It was concluded that having pet insurance significantly decreased the risk of economic euthanasia by owners suggesting that decisions pet owners make in the case of emergency expenditure are very much financially motivated (Boller et al., 2020). This is also supported by Kipperman et al. (2017) research into the financial implications of veterinary care and the motivations behind opting for euthanasia and by Williams et al. (2020), who, as discussed above, found that the total amount paid on pet care (excluding pet insurance) was significantly reduced if the owner had pet insurance.

As seen in the Dunn (2006) study, veterinary care providers work to combat these financial challenges by providing payment plans for those facing hardship or otherwise working with third-party credit providers (Sullivant et al., 2020). Boller et al. (2020) note several limitations to their research, many of which referred to the specifics of the animals and the retrospective nature of the study. A limitation of the Boller et al. (2020) study is that owners who are willing to pay for pet insurance are also more inclined to spend on their pet's treatment, so the fact that they do have pet insurance, while helpful, may not have been the deciding factor. Additionally, in the Boller et al. (2020) study, all participating veterinary hospitals required a deposit of several thousands of dollars upon admission of the animal, and the owner was liable for this cost irrespective of whether they had pet insurance.

2.4.4 Conclusion

As discussed in Section 2.1, there is significant evidence to suggest that human and animal relationships have been developing for thousands of years. The domestication of animals over time has offered both humans and animals a significant survival advantage in mutually beneficial relationships. Due to the nature of the relationships between domestic animals and humans, people have now come to value the life of their animals in similar esteem to that of other family members or friends. Multiple researchers have examined the benefits of pet ownership, reporting contradicting findings on whether owning a pet improves the physical and/or mental health of pet owners.

In the 1970s attachment theory was created to conceptualise the relationships between parents and their children. According to this theory, certain criteria must be met for the attachment to be seen to exist. In 2011 researchers reported that certain attachment styles could be applied to relationships between owners and their pets. Research has also been conducted across many different countries and cultures, which point to human and animal relationships being very similar to those between humans and their family members. However, this research does not explicitly examine whether humans and pets fulfill the requirements for attachment theory to be applied. It has been shown in Section 2.4.1 that the

cost of pets and their care is quite significant; it also shows varying levels of pet insurance uptake across different countries. With the exception of a study that examines the effects of pet insurance on decision making, while only considering one specific medical condition that affects only dogs, there is no prior research examining the effects that pet insurance has on veterinary spending. Similarly, no research has been conducted to determine if Australian pet owners who display attachment seeking behaviour are likely to spend more on their pet's veterinary care. This research project addresses these gaps.

3.0 Methodology

3.1 Research Aim and Questions

The core aim of this research project is to investigate the underlying reasons why pet owners choose to spend money on veterinary care.

To address the gaps identified in the literature review, the first research question will form the foundation for this project. It was not yet known what factors are influencing Australian pet owners to spend money on their pets. Once this has been addressed, one will be able to build upon these factors to narrow down the behaviours and circumstances that drive spending on veterinary care for household pets. This leads to the first research question:

1. What factors influence pet owners to spend money on veterinary care?

Because of the existing literature and from general experience and observations of human behaviours, it is presumed that attachment often plays a role with most decisions that are made by owners regarding their pets. It is important to determine whether individuals or families who display more attached behaviour (for instance, fulfilling some or all the prerequisites that Bowlby (2005) deemed to be indicative of attachment in humans) are more likely to spend than those who do not fulfil this framework. Therefore, the following research question was included:

2. Are pet owners who display more attached behaviours more likely to spend more on their pet's care?

Boller et al. (2020) examine the relationship between pet insurance and the medical outcome of one singular condition affecting dogs. It is important to differentiate between owners who spend money knowing that this will be compensated by insurance, and those who spend knowing that the costs will not be recovered. This way, it will be clear to see what factors influenced their spending and how much each spend. The following research question allows for comparison between the decisions pet owners make and their insurance circumstances:

3. Does pet insurance affect the decision to follow through with veterinary treatment?

After reviewing the literature surrounding human and pet interactions and seeing how animals can adopt similar attachment styles to children and adults (Zilcha-Mano et al., 2011), it became apparent that attachment theory may also be applied to the relationship between pets and their owners. Answering the final question would be very important and beneficial to many stakeholders from not only animal care industries but psychologists and government bodies.

4. Can attachment theory be applied to human-pet relationships?

This research hypothesises that owners who display attachment behaviours such as allowing their pet on furniture, buying their pet gifts, and talking to them as if they can understand them, will be more likely to spend more on their pet's veterinary care or be more inclined to spend on elective or ongoing care/costs than someone who does not engage in such behaviours. Additionally, the open-ended questions are analysed through thematic analysis, and themes such as attachment and justifications for spending have been identified by looking at the language that was used by the respondents. These themes are used to provide context to the answers that the survey provided, as well as the choices they have made in relation to their pets' care. This was done to ensure that any mitigating factors or circumstances that influenced the owner's decision-making could be identified.

3.2 Research Method

This research project aims to answer the research questions pertaining to expenditure on pet care using an online survey that has been designed to gain insight into the gaps identified in the literature (see section 2.0 for the Literature review). The survey consisted of 33 multiple-choice questions and three open-ended questions (see Appendix 2). An online survey was deemed to be the most appropriate method to gather data for this research project. This allowed clients to comfortably answer the questions to the survey in their own time. It also allowed for anonymity as some questions within the survey may have been uncomfortable to answer should they have participated in an

interview. There was another possibility of gathering data directly from the veterinary hospitals however, this created issues with client/patient confidentiality. This method would also not have allowed for data to be collected about the client, their circumstances, and their feelings. The format and the nature of the questions asked were loosely modelled on a survey conducted by Kipperman et al. (2017). The Kipperman et al. (2017) study explored the costs of the treatments from the veterinarian's perspective and was used as a basis for the structure of the survey used in this research project. No questions from Kipperman et al. (2017) were used in the questionnaires for this project as the research conducted by Kipperman et al. (2017) related to a different topic and addressed a different audience. However, the survey was structured in a similar manner by gathering the details and circumstances of the individual, before moving on to more detailed questions that would provide insight into their relationship with their pet and their pet's clinical circumstances. After the input from veterinarians and their customers (who were consulted as part of the survey development process in this study), the questions and structure of the research were developed to fulfill the research aims. The feedback provided included clinical insight into the different treatment types and varieties of specialist care that could be received by pets. It also included feedback around behaviours that people display toward their pet, such as talking to their pet and purchasing their pet's gifts on special occasions.

Questions 1 through to 11 in the survey aimed at understanding the owner, their circumstances, and the pet. These survey questions have been piped so that owners completing the survey were not asked questions unrelated to veterinary treatment that their pet would be receiving. This information obtained from the open-ended questions is vital to understanding the decisions that the owner has or is going to make, as some owners may display very attached behaviour towards their pet but cannot financially afford the options of treatment. Questions 11 through to 18 aimed to determine the level of attachment the owner has to the pet through a range of questions that were developed with attachment theory in mind (Bowlby, 2005). For instance, a family whose pet is not allowed indoors and

onto furniture is expected to be 'less attached' than a pet who is allowed indoors and on household furniture. It was also assumed that should the pet be allowed onto furniture; it is highly likely that the owner would also spend more time with the pet. This survey then addressed questions about the most recent diagnosis of the pet or the concerns of the animal's condition, the expected treatment that the pet will/did receive, and the anticipated outcome.

Lastly, the multiple-choice questions 28, 29 and 30 probed the insurance circumstances that affect the owner's decision to spend on their pet's care, including the proportion of veterinary expenses covered by pet insurance. At the end of the survey, there are several open-ended questions (questions 34, 35 and 36) where owners were able to elaborate (if they chose to do so) on why they have made their decisions in relation to their pet's treatment, including how they financed the treatment. This provided greater depth and understanding to the decision-making process owners faced as well as their current circumstances that led them to make the decisions they made.

The survey designed and used in this study was anonymous, voluntary, and was distributed to clients by veterinary clinics who have consented to participate in this study. The list of the veterinary clinics that agreed to participate has been added as Appendix 1. To reach the target audience, clinics distributed the survey via their social media accounts and/or displayed a QR code linked to the survey in the reception area of their clinics. This allowed for participation to be "owner led" and not requiring any interaction between clinic/veterinarian/owner (see 'Sample' section below for more details). The survey was completely anonymous, and owners had the option to skip any question that they did not want to answer. The survey has been added as Appendix 2. Strong consideration was given to the sensitivity of the questions asked of participants to ensure the least possible distress or upset to the participant.

3.3 Sample

The respondents in this study included any current cat and/or dog owners or carers in Australia (age 18 and above). Besides the age and dog/cat ownership, there were no other specific inclusion

criteria for this study. In the time period that the survey was made available to respondents (6 February 2021 - 4 April 2021) the survey received 105 responses.

3.4 Analysis Procedure

Categorical data has been analysed using frequency tables and cross-tabulations. Additionally, qualitative analysis was used to analyse the open-ended questions that participants responded to. All statistical analyses were performed using the statistical software SPSS Statistics 27.

4.0 Results

4.1 Descriptive Statistics

4.1.1 Description of Owners

In total, 105 Australian pet owners responded to the “Economy of Pets” survey between 6 February 2021 and 4 April 2021. Table 1.A shows the distribution of the demographics of the owners who participated in this study. Respondents' ages ranged from 18 years to 50+ with 56.7% being aged between 25 – 35, and 76.9% of respondents were female with only 23.1% being male. Many respondents (48.1%) earned a household income of over AUD100 000, and most respondents (75.7%) did not have dependents. This large proportion of respondents without dependents possibly have a higher disposable income than people with dependents who require financial support. Of the responders, 79.4% were owners of dogs and 20.6% were owners of cats. Most owners (76.7%) considered their pet to be a “family pet” (owned by the family rather than the individual). Given the large number of female respondents and dog owners in this sample population, this study will likely be biased towards the opinions of women and those who own dogs as pets.

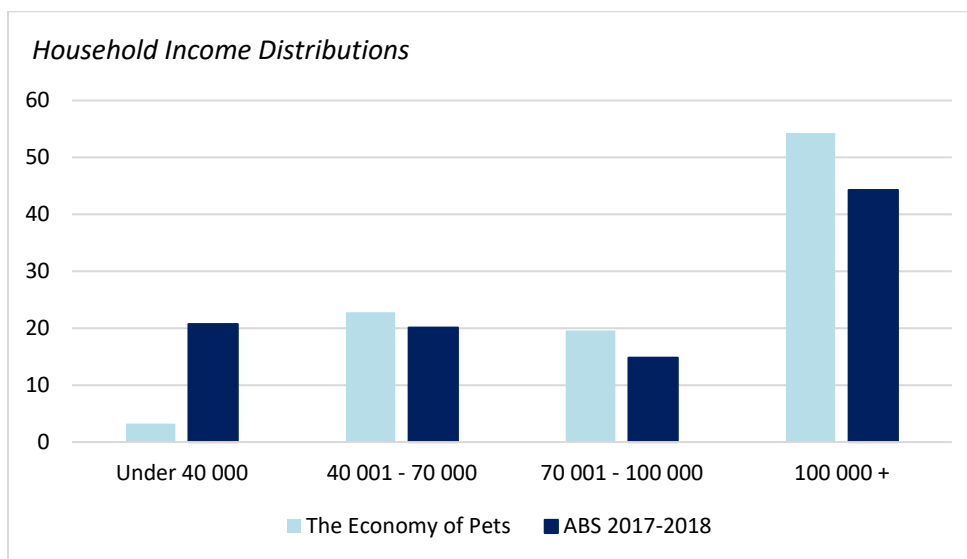
Table 1.A
Descriptive Statistics of Owners

	Variable	Frequency	%
Owners Age	18-24	10	9.6
	25-35	59	56.7
	35-50	21	20.2
	50+	14	13.4
Owners Gender	Male	24	23.1
	Female	80	76.9
Annual Income	Under 40 000	3	2.9
	40 001 - 70 000	21	20.1
	70 001 - 100 000	18	17.3
	100 000 +	50	48.1
	Prefer not to disclose	12	11.5
Major Liabilities	Car Loan	23	22.3
	Personal Loan	13	12.6
	Home Loan	22	21.4
	I have no liabilities	31	30.1
	Other (specify)	7	6.8
	Prefer not to disclose	7	6.8
Do you have any dependents	No	78	75.7
	Yes	25	24.3
Species of pet being treated	Dog	81	79.4
	Cat	21	20.6
Would you consider the pet apart of the family	No	24	23.3
	Yes	79	76.7
Do you allow your pet on any of the following household furniture	Couch	69	67
	Bed	3	2.9
	All furniture	15	14.6
	None	16	15.5
Do you speak to your pet as if it can understand you	Yes	87	84.5
	No	1	0.9
	Sometimes	15	14.6
Do you buy your pet birthday and/or Christmas presents	Birthday presents only	2	1.9
	Christmas presents only	17	16.5
	Both birthday and Christmas presents	53	51.4
	Neither	31	30.1

Table 1A shows 67% of owners allowed their pets onto the couch, 14.5% of owners allowed their pets onto all furniture and 15.5% of owners said they did not allow their pets on any furniture at all. With over half of the respondents (87) reporting that they allow their pets up onto household

furniture, it can be concluded that pets and owners are actively participating in proximity seeking behaviours. This behaviour fulfils one of Bowlby's (2005) four prerequisites for attachment to exist. This physical and emotional closeness between owners and pets can be seen as a source of security, comfort and enhanced physical and emotional wellbeing. This is supported by the research conducted by (Sabel, 2000). Zilcha-Mano et al. (2011) also discussed how we often see owners and their pets actively seeking close interaction and proximity to one another. Owners have regularly been seen to be comforted by their pets and are provided with emotional relief, affection, and support. In this study, almost all of pet owners (99.1%) said that they speak to their pet as if the pet can understand them in some capacity, and 69.8% of pet owners buy their pets either birthday presents, Christmas presents or both. For the full table of the descriptive statistics of owners, refer to Appendix 3. However, since almost all of those who participated in this study showed attachment behaviours to their pets, it is difficult to test whether those who do not have attachment-like behaviours were likely to spend less on their pets as was intended in this investigation.

Figure 1



Of the participants in this survey, 54.3% earned a household income of over AUD 100 000, which may be a contributing factor when looking at their willingness to spend on their pet's care. However,

when the incomes reported by respondents are compared to household averages reported by The Australian Bureau of Statistics (2020) (Figure 1), the distribution of income in the survey was very similar to the Australian average. Therefore, based upon the reported information, the participants within this survey are representative of the Australian population.

4.1.2 Description of Pets

Table 1.B shows the various descriptors of pets and their veterinary treatment in this study. These questions were asked of the owner to provide additional insight and to further understand their circumstances and their pet's treatment. There are many factors that may affect the type of treatment that the pet may receive as well as the willingness of the owner to spend on the pet's care, as discussed in Boller et al. (2020). There was a combination of both rescue pets and non-rescue pets, making up 38.8% and 61.2% respectively. The age of the pets varied from under one year of age to over 12 years of age. The majority (39.8%) of respondents' pets were in the 1 – 4-year age range, and 46.6% of owners had owned their pet for between 1 and 5 years. Most of the pets (84.5%) received regular veterinary care, including vaccinations. Given that most of the pets in this study have received their vaccinations and regular veterinary care, one would expect that many diseases would be detected in the early stages, and therefore less costly treatments would be required. It can also be speculated that their willingness to undergo regular veterinary treatments indicates that these owners would be more likely to spend money on their pets.

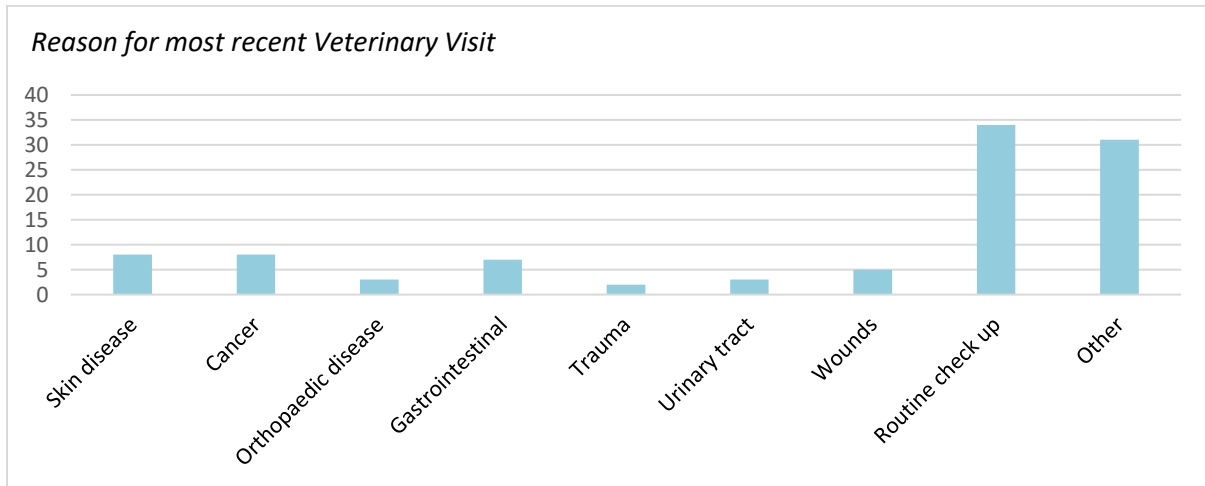
Table 1.B
Descriptive Statistics of Pets

	Variable	Frequency	%
Was the pet a rescue	No	63	61.2
	Yes	40	38.8
Age of the pet	Under 1 year	6	5.8
	1 – 4	41	39.8
	5 – 8	27	26.2
	9 – 12	14	13.6
	12 +	15	14.6
How long has the pet been owned by the owner	Under 1 year	13	12.6
	1 – 5	48	46.6
	6 – 10	21	20.4
	10 +	21	20.4
Does the pet receive regular veterinary check-ups (including vaccinations)	No	16	15.5
	Yes	87	84.5
How long has the pet had the condition for	1 week or less	24	35.8
	1 – 3 months	9	13.4
	6 – 12 months	6	9
	1 + years	18	26.9
	Unknown	10	15
Has the pet received treatment for this condition before	No	42	62.7
	Yes	25	37.3
Has the pet received treatment for a non-related condition?	No	21	31.3
	Yes	46	68.7
Is the current condition life threatening	Yes	22	33.8
	No	43	66.2
Is the current treatment emergency, elective/preventative or palliative	Emergency	17	27.4
	Elective/preventative	18	29
	Ongoing	19	30.6
	Palliative	8	13
Is the treatment expected to prolong the life of the pet	Yes under 1 year	4	6.3
	Yes 1 – 3 years	5	7.9
	Yes 3 + years	12	19
	No	19	30.2
	Unknown	23	36.5

Figure 2 shows the distribution of conditions, showing that 33.7% of owners listed their pets' current condition as "Routine check-up (including vaccination and sterilisation)". "Other" was the next most frequent answer (30.7%), with respondents citing diabetes, kidney disease, seizures, snake bites, rodent bait poisoning, pancreatitis, dentistry, ophthalmology, ear infection, autoimmune disorder,

endocrine disorders, reaction to flea treatment, allergies, and arthritis as the pet’s condition. Many of these conditions relate to an ongoing disease process or require ongoing treatment, often from referral hospitals, which made up a large proportion of the sample population. Therefore, it could be concluded that this survey has captured owners who are dedicated to their pet’s treatment and well-being.

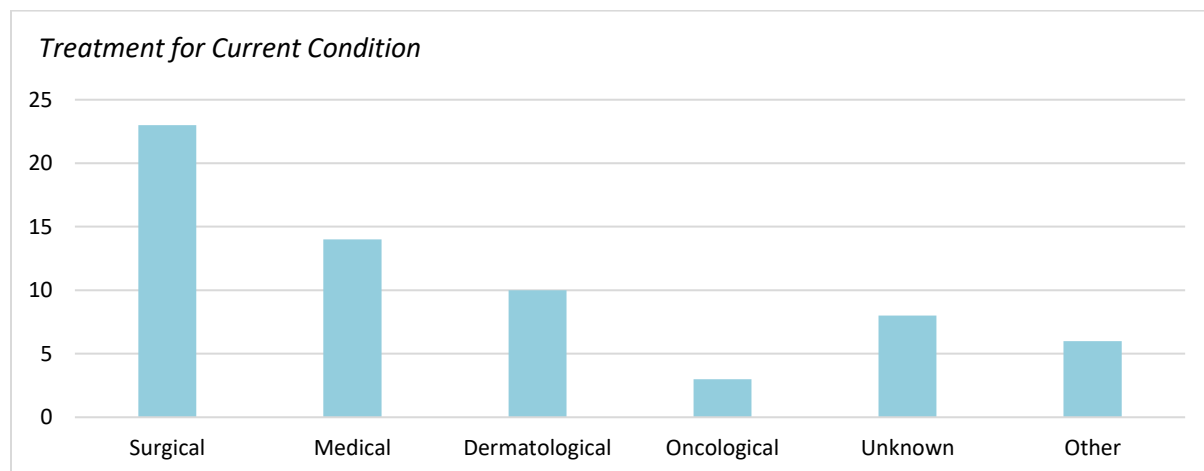
Figure 2



Surgery was the most common method of treatment for the pet’s condition (35.9%), followed by medicine (21.9%); this distribution of disciplines of treatment is displayed in Figure 3. It could be theorised that these distributions mean that most respondents were likely referred to these specialist departments, and therefore were also prepared to spend the money needed for their pet’s treatment. The clients who go onto referral are typically briefed by their general practice veterinarian about the type of costs to expect upon referral and therefore they would be more likely to accept this increased cost, otherwise referral may have been declined. This theory is supported by Kipperman et al. (2017), who found that referral veterinarians do not face as much difficulty when discussing costs of treatment with the client in comparison to general practice veterinarians. The theory that those who have accepted a referral are more prepared to spend money on their pets is further supported by the research conducted by Sullivant et al. (2020). Sullivant et al. (2020) reported that referral to specialist

practices was typically refused if there were financial limitations that the client was facing, therefore acting as a filter, and reducing the likelihood of treatments being declined in the referral setting.

Figure 3



To gauge the preparedness for spending, along with the likelihood of opting for economic euthanasia, owners were asked how long the pet had the condition for. Table 1.B also shows that the most frequent response from owners (35.8%) was 1 week or less, while 26.9% of owners reported their pets for having the condition for one or more years, and 15% didn't know how long the pet had the condition. Of the pets in this survey, 62.7% had not received prior treatment for their condition and 68.7% had received treatment for a non-related condition prior to their recent vet visit. The owners were then asked if their pet's condition was life threatening or not; the findings showed that 33.8% of pets had a life-threatening condition. The nature of treatments was mostly evenly distributed across three categories, with 30.6% of treatment being ongoing, 29% elective/preventative and 27.4% being emergency; however, only 13% of treatment was found to be palliative.

When the owners were asked how many years the treatment would prolong the pet's life, 30.2% of respondents did not expect it to extend the life of the pet at all, this could be due to the condition that the pet was being treated for. If the condition had no risk of affecting the longevity of the pet's life, the treatment would likely not extend the life of the pet. It was revealed that 33.2% of pet

owners expected that the treatment would prolong the life of their pet. It was surprising to see the number of owners who would still spend a significant amount of money even though the life of their pet would not be extended more than one year. There were 36.5% of respondents who did not know if the treatment would prolong the life of the pet, this also may have been due to the nature of the pet's condition, but it could also mean that they were taking a chance on the treatment in the hopes that it would extend the life of their pet. These results allow assessment of the severity of the illness and under what circumstances the owner would be willing to spend the required amount of money. The information gained from these questions allowed for further exploration of the motivations behind pet owner spending through cross tabulations in Section 4.1.3, Section 4.2.1 and Section 4.2.2. It was important to know, particularly in the case of life-threatening conditions, what the nature of the pets' treatments were (for example: unexpected emergency treatment, a cure or palliative care) as it was hypothesised that this would strongly impact the willingness to spend.

4.1.3 Description of Costs

This section explores the nature of the costs incurred by the participants in this study and provides insight into the financial circumstances of the participants in the study. It was found that 46.9% of owners who participated in this study did not have insurance for their pets, while 32.7% had insurance that did not cover the full cost of the pet's treatment. This can be seen in Table 1.C, which shows the distribution of owners' insurance status and circumstances, as well as descriptive statistics about the out-of-pocket costs they incurred after insurance has been considered (if they had insurance). It is not fully clear why nearly half of the participants did not have the pet insurance and there might be a range of reasons for that, such as cost saving, irresponsibility, the pets eligibility, or other reasons. Of those with pet insurance, 30.2% spent between AUD51 - AUD70 monthly on insurance, and 18.9% spent between AUD21 - AUD35 monthly on insurance. This differentiation could be due to cat insurance costing less than insurance for dogs. This is discussed further in section 3.2.1. When asked about the

nature of the costs of the pets' treatment, most respondents reported that the cost incurred was a one-off cost for the treatment of their pet (52.6%).

Table 1.C
Descriptive Statistics of Costs

	Variable	Frequency	%
Does pet insurance cover the cost of the treatment	No	17	17.3
	Yes but not 100%	32	32.7
	Yes	3	3.1
	I don't have pet insurance	46	46.9
How much do you spend on pet insurance on a monthly basis	\$20 or under	6	11.3
	\$21 – \$35	10	18.9
	\$36 – \$50	8	15.1
	\$51 – \$70	16	30.2
	Above \$71 please specify	13	24.5
Excluding pet insurance, is the cost of the pet's treatment likely to be ongoing	Yes, the pet's treatment will incur lifelong costs	36	37.1
	Yes, but the costs not extending beyond a year	10	10.3
	No, this as a one-off cost of treatment	51	52.6
How much does/will the upfront component of the pet's treatment cost?	\$500 or under	19	43.2
	\$501 – \$1000	5	11.4
	\$1001 – \$4000	6	13.6
	\$4001 – \$8000	4	9.1
	Above \$8001 please specify	4	9.1
	There is no upfront cost	6	13.6
How much does will the regular treatment cost you on a monthly basis	\$100 or under	27	62.8
	\$101 – \$300	9	20.9
	\$301 – \$500	5	11.6
	Above \$501 please specify	2	4.7
How much does will the regular treatment cost you as a one off cost?	\$500 or under	30	57.7
	\$501 – \$1000	6	11.5
	\$1001 – \$4000	8	15.4
	\$4001 – \$8000	7	13.5
	Above \$8001 please specify	1	1.9

It was found that 37.1% of owners reported that the pet's treatment would leave them with lifelong, ongoing costs, and only 10.3% of owners reported that the costs would be ongoing, however, not extending beyond a year. Identifying the upfront or ongoing nature of the costs could provide a more thorough understanding of motivations of spending on veterinary care. It was hypothesised prior

to this investigation that owners would be more inclined to spend a significant amount of money if the treatment would cure their pet versus an ongoing condition that required regular costly treatment. These results show that over half of the owners who participated were in the situation where a one-off treatment was expected to cure their pet of their ailment.

Those who answered “yes” to any type of ongoing costs were directed to two questions relating to the “upfront component” and the “regular ongoing treatment”. Of respondents with ongoing costs, 43.2% of participants spent AUD500 or less on upfront costs, and 62.8% spent AUD100 or less on the regular monthly treatments. Those who answered “No, this was a one-off cost of treatment” were directed to a different question which asked for only the upfront component of the treatment. Again, most owners (57.7%) spent AUD500 or less on the upfront component of their pet’s treatment, while 15.4% of owners who spent between AUD1001 - AUD4000, 13.5% spent between AUD4001 - AUD8000 and only 1.9% of owners spent more than AUD8000 on their pet’s treatment. These data did not allow for adequate analysis due to the low number of people in each category, so the cost categories were merged into three categories: under AUD500, AUD501 - 4000 and above AUD4000. Section 4.2.1 cross-tabulates these costs with the treatment outcome on the pet’s mortality.

4.2 Statistical Analysis

4.2.1 Non-emotive Factors

As shown in Table 1C most participants fell into the lower spending brackets with 57.7% spending less than AUD500, 26.9% spending between AUD501 - AUD4000 and 15.4% spending more than AUD4000. As discussed in Section 4.1.3, certain categories of data were re-coded into new categories to increase and balance the number of observations in each category. This uncovered some statistically significant relations that were previously obscured. These cross-tabulations are shown in Tables 2A and 2B. The “upfront cost” and “upfront one-off component” variables were re-coded from five categories into three. These re-coded categories were under AUD500, AUD501 - 4000 and above

AUD4000. Table 2A cross-tabulates the nature of the pet’s condition and the amount spent by the owner. It shows that a higher proportion of pet owners are inclined to spend more on their pet’s treatment if the pet’s condition is life threatening. Relative to the ‘expected’ frequency of 5.1¹ owners, 10 out of the 65 owners that responded (15.4%) spent over AUD4000 for the treatment. Correspondingly higher than expected frequencies of spending less than AUD4000 were recorded when the condition was not life threatening. A Pearson Chi Square test confirmed that the proportions were statistically different from their expected values, significant at 0.005.

Table 2.A

Crosstabulation of seriousness of condition by treatment cost

This table presents a crosstabulation on Life threatening Condition * Treatment Cost

	Treatment Cost			
	Under \$500	\$501 - \$4000	Above 4000	Total
Not life threatening	23	15	5	43
Life threatening	5	7	10	22
Total	28	22	15	65

Pearson Chi-Square 10.454 (2 df, significant at 0.005).

Bold denotes values exceeding expectations

Table 2.B shows the cross-tabulation analysis of owner’s spending when considering the treatment’s ability to extend the life of the pet, this provides insight into whether the pet’s mortality is a motivating factor in spending on veterinary care. Seven out of 63 (11.1%) owners spent over AUD4000 when the treatment would extend the life of the pet by more than 3 years, with another 2 (3.2%) would do so if it would extend life by more than a year. Both proportions are statistically above (chi-square significant at 1%) the expected frequencies of 2.9² and 1.2 respectively and compare with the absence of

¹ The expected frequency 5.1 = 22 / 65 * 15 is the row total divided by grand total multiplied by column total.

² The expected frequency 2.9 = 12 / 63 * 15.

any owners prepared to spend this amount when the treatment would not extend the life of the pet or extend it for less than 12 months. The expected frequency for the occurrences of spending more than AUD4000 yet not extending or minimally extending the pet’s life is 1 and 4.5 respectively. While this strongly suggests that owners are prepared to spend more when life will be extended, consistent with attachment theory, it is recognised that the result may follow from treatment that extends life, by its nature, being more expensive. When it was unclear whether the treatment would extend life, the outcome was similarly ambiguous with more owners than expected spending more than AUD4000, but also spending less than AUD500.

Table 2.B

Crosstabulation of treatment outcome condition by treatment cost

This table presents a crosstabulation on Treatment Prolonging the Life of Pet* Treatment Cost

	Treatment Cost			
	Under \$500	\$501 - \$4000	Above 4000	Total
Yes under 1 year	2	2	0	4
Yes 1 – 3 years	0	3	2	5
Yes 3 + years	4	1	7	12
No	9	10	0	19
Unknown	11	6	6	23
Total	26	22	15	63

Pearson Chi-Square 20.626 (8 df, significant at 0.008)

Bold denotes values exceeding expectations

Pet insurance status was cross tabulated across the two species of pets. Table 2C displays the categories of pets in relation to pet insurances. We can see that of the 76 dog owners, just over half (40) of these dogs were covered by pet insurance. Very similarly, it was found that the insurance status of

cats was evenly distributed with 10 cats not being insured and 11 cats who were insured. These results are in line with the findings reported by Williams et al. (2020).

From this cross tabulation, it could be concluded that there is no difference between the propensity of the owners of dogs and the owners of cats to take out pet insurance on their animal.

Table 2.C

Crosstabulation of insurance status by species of the pet

This table presents a crosstabulation on Insurance Status of the Owner * Species of Pet

	Species		
	Dog	Cat	Total
Not Insured	36	10	46
Insured	40	11	51
Total	76	21	97

Pearson Chi-Square .000 (1 df, significant at 0.984)

Bold denotes values exceeding expectations

Insurance for dogs frequently fell into the more expensive categories of pet insurance (over AUD50 monthly), with no cats falling into this same category. This is consistent with pet insurance providers charging between AUD10 - AUD20 more for covering dogs than cats depending on the type of cover. The costs of premiums for cats and dogs are shown in Table 2D. It was found that there were 4 insured cats in the category of AUD20 and under, this exceeded the frequency of 1.3³ that would be expected if insurance costs were unrelated to species. Conversely, there were 15 insured dogs in the AUD51 - AUD70 who also exceeded the expectation of 11.8. The Chi-Squared analysis shows these differences to be statistically significant at 0.021, confirming that dogs are more costly to insure than cats. This is also supportive of what was reported by Animal Medicines Australia (2019) and what was discussed in Section 4.1.3 where dogs are seen as the more expensive pet to both obtain and care for.

³ The expected frequency 1.3 = 6 / 52 * 11

Table 2.D*Crosstabulation of monthly cost of pet insurance by species of the pet*

This table presents a crosstabulation on Insurance Cost (monthly) * Species of Pet

	Species		
	Dog	Cat	Total
\$20 or under	2	4	6
\$21 – \$35	8	2	10
\$36 – \$50	6	2	8
\$51 – \$70	15	0	15
Above \$71 (specify)	10	3	13
Total	4	11	52

Pearson Chi-Square 11.584 (4 df, significant at 0.021)

Bold denotes values exceeding expectations

Pet insurance was not found to have any statistically significant effect on spending on pet care.

Table 2E shows the relationship between pets who were and were not insured, and the amount that the owners had spent on the pet's treatment. Contrary to popular belief, this study has found that there is no statistical difference between the out-of-pocket spending of the pet owners who have invested in pet insurance, and those who have not invested in insurance (significant at 0.878). Of the pet owners who had insurance for their pets only two cost categories exceeded frequency expectations with 14 owners spending between AUD501 - AUD4000 and 9 spending over AUD4000. These frequencies only occur slightly above their expected count of 13.3⁴ and 8.5⁵ respectively. In comparison, the number of owners (28) without pet insurance that spent less than AUD500 also slightly exceeded the expected frequency (26.8⁶). These deviations from the expected frequencies were not statistically significant as indicated by

⁴ The expected frequency 13.3 = 52 / 98 * 25

⁵ The expected frequency 8.5 = 53 / 98 * 16

⁶ The expected frequency 26.8 = 46 / 98 * 57

the Chi-Square analysis, significant at 0.878. From this analysis it cannot be proven that pet insurance is an influencing factor when it comes to spending on veterinary care.

Table 2.E

Crosstabulation of insurance status by treatment cost

This table presents a crosstabulation on Insurance Status of the Owner * Treatment Cost

	Treatment Cost			
	Under \$500	\$501 - \$4000	Above 4000	Total
Not Insured	28	11	7	46
Insured	29	14	9	52
Total	57	25	16	98

Pearson Chi-Square .261 (2 df, significant at 0.878)

Bold denotes values exceeding expectations

4.2.2 Attachment Factors

As discussed in section 4, questions were posed to owners to understand the respondents, their pet, their attachment to their pet and the circumstances that would possibly affect their decision-making and willingness to spend on their pet's care. These data were then used to run cross tabulations to determine if relationships existed between the circumstantial and attachment variables and the amount spent on their pet's care.

As shown above in Table 1A, nearly all of those who responded spoke to their pets, bought their pets presents, allowed their pets on some form of furniture, and considered their pet as a part of their family. To further explore the impact of attachment on spending, the cost categories were further compiled into two categories for both ongoing and upfront costs; these categories were under AUD100 and over AUD100 for ongoing and under AUD500 and above AUD500 for upfront costs. Cross tabulations were then run to see the relationship between the owners who bought their pets presents and how much was spent on their pet's treatment and following this, cross tabulations were run to evaluate whether the gender of the owner affected this attachment attribute.

Table 3.A

Crosstabulation of owners who buy presents by ongoing treatment cost

This table presents a crosstabulation on owners who Buy Presents *
Ongoing Treatment Cost

	Ongoing Treatment Cost		
	Under \$100	Above \$100	Total
Doesn't Buy Presents	12	2	14
Buys Presents	15	14	29
Total	27	16	43

Pearson Chi-Square 4.669 (1 df, significant at 0.031)

Bold denotes values exceeding expectations

Those who bought their pets presents were spending more on veterinary care than those who did not buy their pets presents. Table 3A and 3B show that there is a statistical difference in the spending habits of owners who buy their pets presents and those that do not. In Table 3A, the number of owners (12) who did not buy their pets presents and spent less than AUD100 on their pet's ongoing treatment cost exceeded the expected frequency (8.8⁷). Additionally, the number of owners (14) who bought their pets presents and spent above AUD100 also exceeded the expected frequency of 10.8⁸. These differing frequencies were shown to be significant at 0.031. This suggests that owners who do not buy their pets presents are less likely to spend more than AUD100 on an ongoing monthly basis.

Similarly, in Table 3B below, the owners who do not buy their pets presents are less likely to spend more than AUD500 on the upfront treatment of their pet's care. There were 11 owners who did not buy their pets presents and spent under AUD500 upfront (the expected frequency of owners in this category was 7.9⁹). Conversely, 16 owners who bought their pets presents spent over AUD500 on their

⁷ The expected frequency 8.8 = 14 / 43 * 27

⁸ The expected frequency 10.8 = 29 / 43 * 16

⁹ The expected frequency 7.9 = 14 / 44 * 25

pet’s treatment, which was also above the expected frequency of 12.9¹⁰. The differences between the reported and expected values were found to be significant at 0.047. This suggests that those owners who are more emotionally attached to their pets or show more attached behaviour such as purchasing their pets gifts, are more inclined to spend on their pet’s care than those who do not show these behaviours.

Table 3.B

Crosstabulation of owners who buy presents by upfront treatment cost

This table presents a crosstabulation on owners who Buy Presents *
Upfront Treatment Cost

	Upfront Treatment Cost		
	Under \$500	Above \$500	Total
Doesn’t Buy Presents	11	3	14
Buys Presents	14	16	30
Total	25	19	44

Pearson Chi-Square 3.960 (1 df, significant at 0.047)

Bold denotes values exceeding expectations

When separating male and female owners and looking at the amount spent on veterinary care with respect to whether they purchase their pets presents, the spending on veterinary care based upon the inclination to buy presents is predominantly driven by female owners. Male owners do not exhibit any statistical relation between these two variables. This can be seen in Table 3C and 3D below. Table 3.C shows that 12 female owners who buy their pets presents spent above AUD100 on an ongoing basis with an expected frequency of 8.5¹¹. Similarly, the number who did not buy presents but spent under AUD100 (11) also exceeded the expectation (7.5¹²). A Chi-Squared test shows these differences in real and expected counts to be statically significant at 0.011. The frequencies of male owners in each

¹⁰ The expected frequency $12.9 = 30 / 44 * 19$

¹¹ The expected frequency $8.5 = 23 / 43 * 16$

¹² The expected frequency $7.5 = 12 / 43 * 27$

expenditure and present-buying category did not differ statistically from the expected frequencies. The Chi-Squared statistic indicates the differences between the real and expected counts and is statically insignificant at 0.673.

Table 3.C

Crosstabulation of genders of owners who buy presents by ongoing treatment cost

This table presents a crosstabulation on the gender of owners who Buy Presents * Ongoing Treatment Cost

		Ongoing Treatment Cost		
		Under \$100	Above \$100	Total
Male	Doesn't Buy Presents	1	1	2
	Buys Presents	4	2	6
Female	Doesn't Buy Presents	11	1	12
	Buys Presents	11	12	23
	Total	27	16	43

Male: Pearson Chi-Square 0.178 (1 df, significant at 0.673)

Female: Pearson Chi-Square 6.492 (1 df, significant at 0.011)

Bold denotes values exceeding expectations

In Table 3.D, also demonstrates that the result is driven by females. Fourteen females buy presents and spend more than AUD500 upfront on their pet's treatment, which exceeds the expected number in this category of 10.3¹³. Similarly, more than the expected frequency of females that do not buy presents spend less than AUD500. These observed frequencies are statistically different from their expected values, significant at 0.004. For males, the observed and expected frequencies were not statistically different.

¹³ The expected frequency $10.3 = 24 / 44 * 19$

Table 3.D*Crosstabulation of genders of owners who buy presents by upfront treatment cost*

This table presents a crosstabulation on the gender of owners who Buy Presents * Upfront Treatment Cost

		Upfront Treatment Cost		
		Under \$500	Above \$500	Total
Male	Doesn't Buy Presents	0	2	2
	Buys Presents	4	2	6
Female	Doesn't Buy Presents	11	1	12
	Buys Presents	10	14	24
	Total	25	19	44

Male: Pearson Chi-Square 2.667 (1 df, significant at 0.102)

Female: Pearson Chi-Square 8.229 (1 df, significant at 0.004)

Bold denotes values exceeding expectations

The pattern of attachment leading to increased veterinary spending on pets is further supported by the research undertaken by Brockman et al. (2008), who found that owners are more willing to pay for their pet's expenses if they perceive the pet to be a member of their family. One respondent in the present study expressed their strained relationship with their family and their pet but still chose to spend a significant amount on the pet's treatment, stating: "The relationship between the dog and family has been strained due to the dog's vicious nature, we chose to do what we could to give him the best life. I chose to pay thousands for treatment as he is still part of the family and our responsibility - it felt wrong to let him die due to simply "not wanting to spend the money". It is purely emotional reasoning behind my spending on his pet care." (PP98). There were also many comments made by respondents that agree with the findings reported above; these comments echoing that they strongly consider their pets to be an extension of or a part of their family and that they are very emotionally attached to their pet. PP28 stated about their pet, "He is my child", while PP65 commented, "I love my dogs like my own children". These sentiments were further echoed by PP67, who said: "He was my child

equivalent” and PP74 “She’s my daughter”. These additions by respondents further the narrative that there is a strong familial and even parental connection between owners and their pets. Full quotes are shown in Figure 4.

Figure 4

Full Quotes by Participants

PP28	He is my child. If I needed I would get a loan. I would do anything to help my beautiful boy
PP39	She is part of the family so I wouldn't hesitate in spending whatever is needed
PP65	I love my dogs like my own children. They are absolutely family to me
PP67	He was my child equivalent (he did not survive), so I would have spent as much as I could if it would have saved him
PP74	She’s my daughter, best friend. I never not spend on her
PP81	They're my family/dependents and are cared for as such.
PP100	Would spend anything to look after my pup as if it were my child
PP101	I will go as far to say I would spend a lot on my cats if they needed me. They are my children and I love them SO much

As shown by the examples above, many of the statements made by owners related to pets being a part of the family, best friends and in many cases, substitutes for children. This is consistent with the findings of Serpell (2003), who reported on the topic of animals possessing human traits and characteristics (anthropomorphism). A survey conducted by The American Animal Hospital Association (1996) found that 75% of pet owners considered their pets a part of their family and, in many cases, were considered as a substitute for children. It was reported that nearly half of the women in one survey said that they relied more on their dogs and cats for affection than they did for their partners or their children (The American Animal Hospital Association, 1996).

While not all of the “attachment attribute” questions did not demonstrate a statistically significant influence on pet owner spending, the length of time the pet was owned was a significant

factor in determining people's spending on veterinary care. However, it could be argued that the longer someone owns their pet, the older the pet may be, and therefore the pet is more susceptible to disease or injury that may require veterinary care, thus introducing a bias towards needing more expensive care. When looking at the respondents who spent above AUD4000, 43.8% (7 out of the 16 respondents) had owned their pet for ten years or more. When initially looking at just the age of the pet and the three categories of costs, there was no significance in the findings, but when broadening the cost categories further into just two categories, "under AUD500" and "above AUD500" there proved to be a relationship between the two, suggesting that spending may not be just a result of the length of time the pet is owned but more so the age of the pet and age-related illness. This is supported by the following comments by participants: "When they are older it can get expensive" (PP7), "She is like my child. I will do whatever gives her the best quality of life. She has many issues and pet insurance has been helpful so far, but the costs do go up a lot every year" (PP57) and "I spend what is needed to keep him as healthy as possible. As I have a few pets and two are older it is a bit expensive " (PP7). These open-ended questions and responses are further explored in Section 4.2.3.

Table 4 shows that the length of time in which a pet has been owned is positively related to the amount owners spend on the pet's care. This suggests that the longer someone has owned the pet, the more likely they are to spend on their pet's care. There were seven owners who spent over AUD4000 on their pet and had owned their pet for 10+ years. The expected number of owners in this category was only 3.3. Of the remaining owners that had owned their pets for 10+ years, six spent between AUD501 - AUD4000 which was also above the expected number (5). The 35 owners who spent under AUD500 and had owned their pet between 1 - 5 years also exceeded the expected frequency of 28.9 for this category. These differences between actual and expected frequencies are statistically significant with a Chi-Squared of 0.048. Because the figures found in the study were significantly different to those expected, it can be concluded that the length of time the pet is owned (and therefore age of the pet) will affect the

amount spent on the pet’s veterinary care. Interestingly, Boller et al. (2020) found that the age of the pet was one of the influencing factors leading to euthanasia which may suggest a reluctance to spend on elderly pets, but this was not directly investigated.

Table 4

Crosstabulation of time the owner has owned the pet by treatment cost

This table presents a crosstabulation on Ownership Length * Treatment Cost

	Treatment Cost			
	Under \$500	\$501 - \$4000	Above 4000	Total
Under 1 year	8	4	1	13
1 – 5 years	35	7	6	48
6 – 10 years	11	8	2	21
10 + years	8	6	7	21
Total	62	25	16	103

Pearson Chi-Square 12.677 (6 df, significant at 0.048)

Bold denotes values exceeding expectations

The connection between length of pet ownership (and therefore age) resulting in increased spending on veterinary care contrasts with the findings from the GDV study conducted by Boller et al. (2020). In this study, it was found that there were several considerations in this decision between spending money to treat the pet or making the decision to euthanise the pet for economic reasons as well as Kipperman et al. (2017), who discussed similar findings. Of these factors, the age of the pet was considered to be a strong influencing factor. Boller et al. (2020) found that if the dog was older the owner would be more likely to euthanise the pet. The Boller et al. (2020) study was also conducted in Australia, so the demographic of pet owners is likely to be similar to that in this study and was also conducted between 2017 - 2018 which is within a few years of this study on the economy of pets.

However, the Boller et al. (2020) study looked only at dogs who had presented at emergency clinics for gastric dilatation-volvulus (GDV) and compared the outcome of the case and the decisions

that owners made through veterinary records. Given that this study only covered dogs and purely looked at the decision to treat or euthanise, this may explain the difference in findings. The 'economy of pets' study included both dogs and cats, focused on pet spending as a whole and not for a specific condition. Moreover, it did not include questions about decisions made by the owner to euthanise the pet beyond the general invitation in the "comments" section. The study by Boller et al. (2020) also used pet insurance records alongside veterinary records to determine whether the pet was covered by pet insurance. The study did not allow for any qualitative data to be collected and analysed.

The frequency of participants who did not have pet insurance and those who did have pet insurance were not statistically different when it came to spending on veterinary care. It has been found that pet owners are motivated to spend by their pet's condition; more specifically, whether their pet's condition is life threatening. While not investigated statistically, the comments made by participants reveal that much of the decision-making of participants in this study is emotionally driven. Participants see a kinship between themselves and their pet, many owners comparing them to children or other members of their family and therefore are willing to pursue any methods of treatment at any cost if this was to benefit their pets.

4.2.3 Open Ended Questions

As participants are completely anonymous in this study, their responses were named PP1 to PP105. In this study, it has been found that pet owners with a household income of more than AUD100 000 had the highest rate of insurance. The relationship between pets being covered by insurance and income may be due to the affordability of pet insurance in comparison to household income. This is something that is echoed by P26, who commented: "Couldn't afford pet insurance. Zip pay is offered at the veterinarian, so I was happy to use that for emergency costs". This study found no difference in out-of-pocket spending on veterinary treatment between owners who have pet insurance and those who do not. The findings from this study contrast with Williams et al., (2020), who found that having pet

insurance increased the total amount spent at the veterinarian by USD211 (approximately AUD300) per annum compared to those who did not have pet insurance. Williams et al. (2020) conducted a study in the United States, whereas this study was conducted in Australia; it can be speculated that the differences in spending on veterinary care with pet insurance may be due to the cultural differences between Australia and the United States. The United States may also have varying types of cover for policies compared to those that are offered in Australia.

However, many comments made by participants show that cost of insurance may be a strong contributing factor, for example, PP63: "Both cats have the highest level of insurance cover... And I spend nearly as much on their insurance as I do their food, litter, and other extras. It's all part of owning a pet, taking financial responsibility.", PP72: "Our dogs are family. Willing to spend anything to keep them happy and comfortable. I just wish pet insurance wasn't so expensive." and PP89: "Pet insurance becomes more expensive and less worth it as they get older!". Contrasting this, one participant (PP63) expressed that they would have been unable to provide treatment for their pet if it was not for pet insurance stating, "So I don't ever have to let money be a factor in my decision, I have always had and always will have insurance. I'm so thankful I have insurance for him as he's ended up having multiple chronic illnesses, which sadly, I wouldn't have been able to afford good management if not for his insurance".

Alongside this, some respondents urged pet owners to have pet insurance to cover any unforeseen costs that may arise. This is supported by the study conducted by Boller et al. (2020), who concluded that owners who had pet insurance cover significantly decreased the frequency economic euthanasia and that decisions that pet owners make when emergency and unforeseen expenditure arises, are very much financially motivated. It was also discussed that while pet insurance was beneficial for helping pet owners navigate large and often unforeseen costs, it did not cover the expenses incurred by the owner entirely (Boller et al., 2020). This is also seen in the responses in this research project.

4.2.4 Limitations

Several limitations have been identified in this study. There were insufficient categories of household incomes used in the survey to distinguish high income owners from average income earners. If this survey was to be conducted again, the question about household income could be adjusted to allow for more categories. The highest household income bracket was AUD100 000 +, which falls within the average household income of Australians as discussed in Section 5.1. It would have been more revealing to include higher household income brackets to capture those who are within a high-income category. In addition, the survey was accessed by individuals who were already visiting their veterinarian. Therefore, the information and results found in this study would be biased to those pet owners who have already sought out veterinary care and more specifically, sought out referral veterinary care. Should this study be repeated in the future, participants could be targeted at a variety of other settings including the supermarket, universities, public transport and pet shops so as to ensure that a wide pool of participants are involved and not just those who have already decided to spend on their pet's veterinary care.

This study also did not have many participating veterinary clinics, while it was attempted to gain the support and participation of clinics in Australia wide only five clinics across three states agreed to participate, there was still enough respondents to gain an adequate analysis on motivations behind spending on veterinary care, however, this may have had more of an impact had more people responded to the study. This means that the answers given in this survey may be biased to the opinions and demographics of the states and cities in which participants reside. While contacting possible participating clinics, it was stipulated that the reason many declined to participate was the pressure their clinics and employees were currently under being short staffed, which is a prevalent issue in the industry today (Kipperman et al., 2017). One survey question in relation to the pet belonging to a loved

one was answered by only one respondent whose pet did once belong to a loved one, however given there was only one respondent it did not allow for useful statistical analysis on this question.

While there was not a large population of veterinary clinics who agreed to participate in this study, the ones who did so were predominantly emergency/specialist practices, with only one of five participating clinics being an exclusively general practice veterinary clinic. This issue could affect the findings of this research as those who would be going to a specialist, or emergency practice may already be prepared to spend more money than those attending a general practice veterinary clinic. The findings from the Kipperman et al. (2017) study support the idea that those attending specialist or emergency practices are already more prepared to spend more money than the customers of general practice clinics. It can also be speculated that those pet owners who are not willing to spend on their pets, or are not as emotionally attached to their pets, would not make the effort to complete a survey about their motivations for spending on their pets' care. This study also did not include any observations about their pet's attachment or interactions with their owners. This factor would likely influence how their owner sees, interacts, and bonds with their pets, possibly affecting their willingness to spend on their pet's care.

5.0 Conclusion

The aim of this research was to better understand the relationships between pets and their owners and how this impacts pet owner's propensity to spend on veterinary care in Australia. The current literature covers veterinary spending from the perspective of veterinarians and the veterinary industry along with a generalised analysis of spending on pets in various countries. However, this study arose because there has been very little research conducted on the motivations behind Australian pet owners spending on veterinary care. Through the analysis conducted in this research project, it has been found that humans and their pets fulfill requirements of the framework created by Bowlby (2005) for attachment to exist. Many respondents compared the relationship they feel with their pet to that of a parent/child bond. This finding supports and further adds to what was reported by Chen et al. (2012), who speculated that the increase in pet ownership and pet owner spending could be due to humans having pets as a substitute for children. Furthermore, this is supported by the research conducted by Serpell (2003), who reported that animals possess human-like traits.

It has been found that pet owners are motivated to spend by their pet's condition, especially when this condition is life-threatening. Pet owners were also shown to be motivated by the likelihood of the treatment to extend the life of the pet. Through the comments made by participants and the statistical analysis that has been conducted, it was established that much of the decision making of the participants in this study is emotionally driven. Participants see a kinship between themselves and their pet, many owners comparing them to children or other members of their family and therefore are willing to pursue any method of treatment at any costs provided it was of benefit to their pets. This supports what was hypothesised at the outset of this research project; that owners who display more attached behaviour are more inclined to spend money on their pets' treatment. While not all of the attachment attribute frequencies were statistically different from the expected frequency of expenditure, those such as length of ownership and buying presents were confirmed to be statistically

significant. Additionally, it was found that, in contrast to what was previously thought both by researchers and the general population (Williams et al., 2020), pet insurance has no statistical impact on pet owner spending on veterinary care. When comparing the spending of pet owners who had pet insurance against those who did not have pet insurance, there was no statistical difference between these two groups.

This research establishes that the attachment framework created by Bowlby (2005) can be applied to pets and their owners, and finds that owners who display more attached behaviours are likely to spend more on their pet's veterinary care. Participants showed that they were more inclined to spend money on their pets if they purchased them birthday and/or Christmas gifts. In addition, people were also more inclined to spend more money on their pets should their condition be life threatening. Building upon this, many participants were willing to spend money even if the treatment was not guaranteed to extend the life of the pet, suggesting they were willing to spend money just for a chance of prolonging their life. Owners were also found to spend more money the longer they had owned their pet. All of the factors mentioned above fit the prerequisites for attachment to exist between pets and owners and suggest that the owners who display more attached behaviours were also likely to spend more on veterinary care. The findings in this study regarding attachment and expenditure is consistent with expectations arising from the application of Bowlby (2005) and demonstrate that this theory of attachment can be applied to human/pet relationships which, to the author's knowledge, has not been done before.

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Appendices

Appendix 1. Participating veterinary clinics

- The Animal Hospital Murdoch University
- Queensland Veterinary Specialists
- Perth Vet Emergency
- Devoted Vets Warragul
- Sydney Veterinary Emergency and Specialists

Appendix 2. Informational letter

Dear participants,

My name is Tara and I am currently undertaking my Masters by Research at Murdoch University. According to a 2019 survey conducted by Animal Medicines Australia, over 62% of Australian households own a pet and spend 12.2 billion dollars per year on their pets. As a pet owner myself, I have often wondered about the various factors that influence this expenditure. This research aims to investigate the reasons why we are so willing to spend money on our furry companions. I would appreciate you taking the time to complete this survey which has been designed to investigate the factors affecting the economy of pets. The collected data will be used for academic purposes only.

- This survey will take no more than 10 minutes of your time.
- Your responses are voluntary and will be confidential and anonymous.
- Responses will not be individually identified.
- All responses will be collated and analysed as a group.
- The data will not be used or made available for any purposes other than this research project.
- You will not be asked to disclose private and sensitive information in this survey. You can skip any question you are not comfortable with answering.
- You will not be identifiable in written reports of this research.
- If you have more than one pet, please answer with the pet who has most recently received treatment.
- You will have access to view the results once the research project is complete at the following LINK

Please take your time, and feel free to contact me if you have any questions, comments, or concerns at: tara.amin@murdoch.edu.au or my below supervisors:

Dr Vita Akstinaite | Primary Supervisor | Vita.Akstinaite@murdoch.edu.au

Associate Professor Grant Cullen | Co Supervisor | G.Cullen@murdoch.edu.au

NOTE:

This study has been approved by the Murdoch University Human Research Ethics Committee (Approval 2020/213). If you have any reservation or complaint about the ethical conduct of this research, and wish to talk with an independent person, you may contact Murdoch University's Research Ethics & Integrity on Tel. 08 9360 6677 (+61 8 9360 6677 for overseas studies) or e-mail ethics@murdoch.edu.au. Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

1. To participate in the survey, please read the following statements and confirm whether you agree with them by ticking the boxes below:

I confirm that I am over the age of 18.

The pet is a cat or a dog.

I confirm that I am the owner or carer of the pet (cat or dog) being treated.

I have visited a veterinarian in the last 12 months

I understand that all information will remain anonymous.

I agree that data gathered in this study being stored anonymously and securely.

I understand that my participation is voluntary and due to the anonymity procedures in place, consent cannot be withdrawn retrospectively.

I confirm that I have read and understand the information above and I consent to participate.

2. What is your age?

18 - 24

25 - 35

35 - 50

50 +

3. What is your gender?

Male

Female

Other

4. What is your annual household income?

Under \$40,000

\$40,001 – \$70,000

\$70,001 - \$100,000

\$100,000 +

Prefer not to disclose

5. Do you have any of the following major liabilities? (Please select all that apply)

Car loan

Personal loan

Home loan

I have no liabilities

Prefer not to disclose

Other (please specify)

6. Do you have any dependents?

Yes

No

7. What is the species of the pet being treated?

Cat

Dog

8. Are you the primary owner of the pet?

Yes

No

9. Was the pet a rescue animal?

Yes

No

10. How old is the pet?

Under 1 year

1 - 4

5 - 8

9 - 12

12 +

11. How long have you owned the pet?

Under 1 year

1 - 5

6 - 10

10 +

12. Did the pet once belong to a loved one?

Yes

No

13. Would you consider the pet a "family pet" (i.e.: considered owned by the family) ?

Yes

No

14. How many other pets do you have in the household?

0 (the pet being treated is the only pet)

1

2

3 +

15. Do you allow your pet on any of the following household furniture? (Please select all that apply)

- Couch
- Bed
- Tables
- All furniture
- None

16. Do you speak to your pet as if it can understand you?

- Yes
- No
- Sometimes

17. Do you buy your pet birthday and/or Christmas presents?

- Birthday presents only
- Christmas presents only
- Both birthday and Christmas presents
- Neither

18. Does the pet receive regular veterinary check-ups (including vaccinations)?

- Yes
- No

19. In relation to your recent veterinary visit/s, what does the current condition relate to?

- Skin disease
- Cancer
- Orthopaedic disease
- Cardiac disease
- Gastrointestinal
- Trauma
- Urinary tract
- Reproduction
- Respiratory disease
- Wounds
- Routine check up (including vaccination and sterilisation)
- Other (please specify)

20. How long has the pet had the condition for?

- 1 week or less
- 1 - 3 months
- 6 - 12 months
- 1 + years
- Unknown

21. Has the pet received treatment for this condition before?

- Yes
- No

22. Has the pet received treatment for a non-related condition?
Yes
No
23. Is this non-related condition chronic?
Yes
No
24. Is the current condition life threatening?
Yes
No
25. Is the current condition treatable by any of the following? (Please select all that apply)
Surgical
Medical
Dermatological
Oncological
Unknown
Other (please specify)
26. Is the current treatment emergency, elective/preventative or palliative? Please select the most appropriate answer
Emergency
Elective/Preventative
Ongoing
Palliative
27. Is the treatment expected to prolong the life of the pet?
Yes Under 1 year
Yes 1 to 3 years
Yes 3 + years
No
Unknown
28. Does pet insurance cover the cost of the treatment?
No
Yes but not 100%
Yes
I don't have pet insurance
29. How much do you spend on pet insurance on a monthly basis?
\$20 or under
\$21 - \$35
\$36 - \$50
\$51 - \$70
Above \$71 please specify

30. Excluding pet insurance, is the cost of the pet's treatment likely to be ongoing?
Yes, the pet's treatment will incur lifelong costs
Yes, but costs not extending beyond a year
No, this was a one-off cost of treatment
31. How much does/will the "upfront" component of the pet's treatment plan cost?
\$500 or under
\$501 - \$1000
\$1001 - \$4000
\$4001 - \$8000
There is no upfront cost
Above \$8001 please specify
32. How much does/will the ongoing component of the treatment plan cost you on a monthly basis?
\$100 or under
\$101 - \$300
\$301 - \$500
Above \$501 please specify
33. How much does/will the upfront/one off component of the pet's treatment cost?
\$500 or under
\$501 - \$1000
\$1001 - \$4000
\$4001 - \$8000
Above \$8001 please specify
34. Please share any comments or experiences you would like to share in regards to the bond that you and your pet share or your motivations to spend/not to spend on your pet's care?
35. If you are comfortable, please comment on how you financed the cost of your pet's care (cash/bank loan/credit card/family assistance/external credit provider etc.)
36. Do you have any other comments relating to the treatment of the animal and/or the cost of pet ownership

Appendix 3. Owner Frequencies

VARIABLE	FREQUENCY	%
Owners Age		
18-24	10	9.5
25-35	59	56.2
35-50	21	20
50+	14	13.3
not recorded	1	1
Owners Gender		
Male	24	22.9
Female	80	76.2
Not recorded	1	1
Annual Income		
Under 40 000	3	2.9
40 001 - 70 000	21	20
70 001 - 100 000	18	17.1
100 000 +	50	47.6
Prefer not to disclose	12	11.4
Not recorded	1	1
Major Liabilities		
Car Loan	23	21.9
Personal Loan	13	12.4
Home Loan	22	21
I have no liabilities	31	29.5
Other (specify)	7	6.7
Prefer not to disclose	7	6.7
Not recorded	2	1.9
Do you have any dependents?		
No	78	74.3
Yes	25	23.8
Not recorded	2	1.9
Species of pet being treated		
Dog	81	77.1
Cat	21	20
Not recorded	3	2.9
Are you the primary owner of the pet?		
No	5	4.8
Yes	97	92.4
Not recorded	3	2.9

Would you consider the pet apart of the family?

No	24	22.9
Yes	79	75.2
Not recorded	2	1.9

How many other pets in the household?

0 (the pet being treated is the only pet)	41	39
1	36	34.3
2	16	15.2
3+	10	9.5
Not recorded	2	1.9

Do you allow your pet on any of the following household furniture?

Couch	69	65.7
Bed	3	2.9
All furniture	15	14.3
None	16	15.2
Not recorded	2	1.9

Do you speak to your pet as if it can understand you?

Yes	87	82.9
No	1	1
Sometimes	15	14.3
Not recorded	2	1.9

Do you buy your pet birthday and/or Christmas presents?

Birthday presents only	2	1.9
Christmas presents only	17	16.2
Both birthday and Christmas presents	53	50.5
Neither	31	29.5
Not recorded	2	1.9

Appendix 4. Pet Frequencies

VARIABLE	FREQUENCY	%
Was the pet a rescue?		
No	63	60
Yes	40	38.1
not recorded	2	1.9
Age of the pet		
Under 1 year	6	5.7
1-Apr	41	39
5-Aug	27	25.7
9-Dec	14	13.3
12 +	15	14.3
Not recorded	2	1.9
How long has the pet been owned by the owner?		
Under 1 year	13	12.4
1-May	48	45.7
6-Oct	21	20
10 +	21	20
Not recorded	2	1.9
Did the pet once belong to a loved one?		
No	102	97.1
Yes	1	1
Not recorded	2	1.9
Does the pet receive regular veterinary check-ups (including vaccinations)?		
No	16	15.2
Yes	87	82.9
Not recorded	2	1.9
How long has the pet had the condition for		
1 week or less	24	22.9
1 - 3 months	9	8.6
6 - 12 months	6	5.7
1 + years	18	17.1
Unknown	10	9.5
Not recorded	38	36.2
Has the pet received treatment for this condition before?		
No	42	40
Yes	25	23.8
Not recorded	38	36.2
Has the pet received treatment for a non-related condition?		
No	21	20
Yes	46	43.8
Not recorded	38	36.2

Is this non-related condition chronic?		
No	33	31.4
Yes	13	12.4
Not recorded	59	56.2
Is the current condition life threatening?		
Yes	22	21
No	43	41
Not recorded	40	38.1
Is the current treatment emergency, elective/preventative or palliative?		
Emergency	17	16.2
Elective/preventative	18	17.1
Ongoing	19	18.1
Palliative	8	7.6
Not recorded	43	41
Is the treatment expected to prolong the life of the pet?		
Yes Under 1 year	4	3.8
Yes 1 to 3 years	5	4.8
Yes 3 + years	12	11.4
No	19	18.1
Unknown	23	21.9
Not recorded	42	40

Appendix 5. Cost Frequencies

VARIABLE	FREQUENCY	%
Does pet insurance cover the cost of the treatment?		
No	17	16.2
Yes, but not 100%	32	30.5
Yes	3	2.9
I don't have pet insurance	46	43.8
Not recorded	7	6.7
How much do you spend on pet insurance on a monthly basis?		
\$20 or under	6	5.7
\$21 - \$35	10	9.5
\$36 - \$50	8	7.6
\$51 - \$70	16	15.2
Above \$71 please specify	13	12.4
Not recorded	52	49.5
Excluding pet insurance, is the cost of the pet's treatment likely to be ongoing?		
Yes, the pet's treatment will incur lifelong costs	36	34.3
Yes, but the costs not extending beyond a year	10	9.5
No, this as a one-off cost of treatment	51	48.6
Not recorded	8	7.6
How much does/will the upfront component of the pet's treatment cost?		
\$500 or under	19	18.1
\$501 - \$1000	5	4.8
\$1001 - \$4000	6	5.7
\$4001 - \$8000	4	3.8
Above \$8001 please specify	4	3.8
There is no upfront cost	6	5.7
Not recorded	61	58.1
How much does will the regular treatment cost you on a monthly basis?		
\$100 or under	27	25.7
\$101 - \$300	9	8.6
\$301 - \$500	5	4.8
Above \$501 please specify	2	1.9
Not recorded	62	59
How much does will the regular treatment cost you as a one-off cost?		
\$500 or under	30	28.6
\$501 - \$1000	6	5.7
\$1001 - \$4000	8	7.6
\$4001 - \$8000	7	6.7
Above \$8001 please specify	1	1
Not recorded	53	50.5