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## **The Impact of Dog-Human Bond on the Selection Criteria of Dog Food**

Francisco Serpa dos Santos Figueiredo

**Master's in Management**

Supervisor: Professor Mónica Mendes Ferreira, Invited Assistant Professor

Department of Marketing, Operational and General Management

November 2022



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## Resumo

Nas últimas décadas, os cães passaram de uma fonte de proteção ou trabalho a serem vistos como parte da família. Neste sentido, um novo mercado de produtos para cães emerge, nomeadamente na área da alimentação. Com o avanço das tecnologias, há uma quantidade de informação e opções variada que influencia os critérios de seleção na alimentação dos cães. O presente estudo de investigação procura analisar a relação entre ligação cão-humano e os critérios de seleção de comida dos cães, uma área da literatura com crescente atenção na comunidade científica, contudo, insuficiente na população portuguesa. A abordagem quantitativa do estudo utilizou como instrumento de recolha de dados um questionário que mediu o nível de ligação cão-humano e os critérios de seleção da ração. Para responder aos objetivos usaram-se estatísticas descritivas, testes paramétricos e não paramétricos. A amostra foi recolhida online e é constituída por 971 participantes portugueses, 18.2% de homens e 82.8% de mulheres com idades entre os 18 e os mais de 65 anos de idade. Os resultados sugerem que as mulheres e gerações mais jovens têm maiores níveis de ligação com os cães e níveis de educação mais altos correspondem a menores níveis; por outro lado, maiores níveis de ligação com os cães encontram-se associados a uma maior importância na qualidade da alimentação bem como numa maior consciência de preço. Foram encontradas diferenças significativas nos critérios de seleção de comida dos cães entre pessoas com altos níveis de ligação e pessoas com baixos níveis de ligação com os cães.

**Palavras-Chave:** *Relação Cão-Humano; Preferências da Comida do Cão; Nível de Vínculo; Comportamentos do Consumidor Relacionados com o Cão; Despesas com Cães.*

**Classificação JEL:** M31 Marketing; M37 Publicidade.



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## Chapter 1 - Introduction

Thousands of years ago, wolves and humans started to get along, creating a bond that still prevails in the present. Today, the dogs in our homes are very distant from those wild wolves thousands of years ago in aspects such as morphology and lifestyle. Dogs are no longer exclusively chosen for their function benefit as protection or work (Boya et al., 2012) and have climbed the family pyramid, in some cases, being viewed as surrogate children (Boya et al., 2014). In 2016, it was estimated that more than half of Portuguese homes had a pet, with around 6,7 million pets in the country. Dogs were the pets that Portuguese people owned the most, with more than 2,5 million dogs, representing 38% of all pets in the country (Growth from Knowledge [GFK], 2016). With the increased presence of dogs in the daily lives of Portuguese families, another phenomenon occurred - the increase in pet-related spending, especially on pet food. The same study conducted by GFK (2016) reported that 56% of monthly spending on their pets was destined for food.

The creation of the internet allowed consumers access to all sorts of information through social media, blogs, and other websites. The ease of accessing piles of information that does not always come from trustworthy sources has propelled consumers to find information about everything online, and pet nutrition is no exception (American Animal Hospital Association [AAHA], 2021). When it comes to different feeding options, consumers have been bombarded with a wide range of offers that are often very difficult to navigate. From commercial canned and dry foods to new trends like the Biologically Adequate Raw Food diet (BARF diet) (McGill, 2019), with price tags ranging from low-cost to premium, consumers can become overwhelmed with the numerous alternatives available. The average annual expenditure on dog food for USA dog owners in 2020 was 442 U.S. dollars, making it their number one annual dog-related cost (Statista, 2021; Pdsa, 2021).

Concerning the dog-human bond, there are prevalent trends in the dog-human relationship, namely the anthropomorphizing of pets. Anthropomorphism is a trend in which humans see and attribute human-like characteristics, such as emotions or expressions, to their animals or other non-human things like objects (Serpell et al., 2003; Boya et al., 2014). The extension of self is a phenomenon that occurs when people regard their possessions, in this case, their dogs, as a part of themselves, attributing to the animal's personality traits of themselves. This can influence behaviours such as buying or caring for the dog (Belk, 1988).

Although there are several studies regarding the extension of self or anthropomorphism and its impacts on pet-related consumption (Hirschman, 1994; Hill et al., 2008; Tesfom &

Birch, 2010c; Boya et al., 2014), there is a lack in the literature regarding the connection between the dog-human bond and how that impacts the decision in the selection of dog food, in particular on the Portuguese population. This study intends to fulfil this specific gap. Therefore, the research problem is the relationship between the level of attachment in the dog-human bond, the owner's sociodemographic characteristics (gender and age), and the selection criteria of dog food.

### **1.1.Dog-Human Bond**

The relationship developed between a dog and its owner is called the dog-human bond. It has its genesis thousands of years ago when humans started to get close to and domesticate wolves. The role of dogs in owners' lives has been taking greater importance being in some cases treated as fellow humans, friends, or even surrogate children (Hirschman, 1994; Boya et al., 2012; Tsai et al., 2020). One consequence of this enhanced importance was its impact on the daily consuming choices being made by dog owners (Beverland et al., 2008; Kylkiahti et al., 2015; White et al., 2021). This relationship can be explained by anthropomorphism and the extension of the self. Concerning the first one, anthropomorphism is the common tendency of humans to attribute human-like characteristics, such as feeling emotions, thinking, or speaking, to non-human animals, and in the case of this work, specifically to dogs. This can only happen when someone engages in a specific interaction, that is, when the dog impresses the subject with its expressive capabilities to the point that the subject considers it human-like (Serpell, 2003; Servais, 2018).

Regarding the extension of the self, it occurs when a subject sees possession as part of him/herself (Belk, 1988). This phenomenon can have great implications regarding consumer behaviour since individuals do not purchase only for their functional purposes but also for the meaning the possession can reflect the individual. Belk (1988) has categorized types of possessions frequently included in the sense of self and therefore are susceptible to extension from one. Belk (1988) identified special categories: personal collections, other people, and pets. In the world of pets, this trend has been studied several times, often used to explain the relationship between owner and pet (Jyrinki & Leipamaa-Leskien, 2005; Boya, 2012).

### **1.2.Dog Food Selection Criteria**

The growth of the presence and importance of dogs in owners' lives is translated into the growth of pet-related purchases. Food is the biggest expense owners regularly incur (Statista, 2021;

Pdsa, 2021), and it is also the one owners spend more time deliberating about since it impacts the physical health and well-being of the pets (Prata, 2022). The decision on the dog's diet is impacted by the owner's beliefs and perceptions regarding their pets' nutrition. Those feeding beliefs are then translated into purchase behaviours, so studying them is imperative better to understand consumers (Vinassa et al., 2020). The academic field showed that dog owners differ in the criteria used to make feeding choices. Those criteria include the source of information, such as the internet or veterinarians, ingredient list, nutritional value, quality, and price of dog foods (Kienzle et al., 1998; Boya et al., 2014; Dodd et al., 2020; Banton et al., 2021; Prata, 2022).

### **1.3. Research Questions and Specific Objectives**

Being consumer behavior so important in the choices made by dogs (Hill et al., 2008; Ridgway et al., 2008; Tesfom & Birch, 2010c), the research question is: "*What is the relationship between the attachment level of the dog-human bond, owner's sociodemographic characteristics, and their dog food selection criteria in Portugal?*". This dissertation aims to understand the relationship between owners and respective dogs regarding the selection criteria of dog food.

Furthermore, the specific study objectives are: (a) to analyze the difference between gender and attachment level of the dog-human bond; (b) to examine the differences between age and attachment level of the dog-human bond; (c) to explore the relationship between the level of attachment of the dog-human and importance of the price of dog food; (d) to investigate the relationship between the level of attachment of the dog-human and importance of the quality of dog food; (e) to study the relationship between the level of attachment of the dog-human and dog food selection criteria; (f) to analyze the relationship between the attachment level of the dog-human and the owner's level of education.

### **1.4. Thesis Structure**

This project is organized into four chapters. The first chapter incorporates the literature review regarding the existing literature on the dog-human bond, dog-related spending, and dog feeding and alternative diets. After the literature review, the second chapter corresponds to the methodology and describes the research design and context, the conceptual model and hypothesis, data collection, and analysis procedure. It also mentioned the methods and instruments used to collect the data. The third chapter corresponds to the findings according to

the hypothesis developed in the study. The fourth chapter corresponds to the discussion of the results. The last chapter describes and discusses the conclusions, contributions, and limitations.



## Chapter 2 - Literature Review

### 2.1. The Dog-Human Bond

A few studies in the academic community have analyzed how consumers interact with their possessions and how they may serve as a window to better understanding them (Belk, 1988). Consumers can better communicate their identities by allocating symbolic meanings to their possessions. Pets, specifically dogs, can be categorized as possessions and contribute to the capacity of the owners to do things and become someone, for example, to create their own identity (Belk, 1988).

The relationship between humans and dogs has gradually developed into a more emotionally complex one beyond the simple "man's best friend" (Knapp, 2010, p.21). This gradual change could also be seen in how companies and brands used dogs to communicate with consumers, with pets taking on a more intimate role. Over the years, advertisements in women's magazines showed dogs more frequently indoors, more often being touched, and less often on a leash showing the evolution of the dog's role in the lives of families from a distance (Kennedy & McGarvey, 2008).

Dogs enrich the lives of their owners and can have the ability to do it in different manners. Lasher (1998) stated that the human's perceptual ability to be in sync with animals allowed the development of this special relationship humans have with dogs. Because of that connection, owners feel they can be themselves in front of their pets. A study by Cohen (2002) aimed to understand the role of pets in families. Its results supported Lasher's theory of owners feeling they can be themselves in front of their pets when it stated that pets allow their owners to express their deepest feelings of intimate connection. While pets are firmly inside the family circle, Cohen's (2002) research showed that they occupy an overlapping space in the family to a different degree than humans. As several researchers have observed, dogs can be seen as family members, and in that line of thought, Hirschman (1994) conducted a study where three a priori subjects were set out to be studied: animals as friends, animals as family members, and animals as self.

As friends, animals are seen as having the utmost value because of the characteristics that were already mentioned before, of providing unconditional love and loyalty (Lasher, 1998; Cohen, 2002; Knapp, 2010). However, the role of pets was more commonly associated with a deeper connection, with several investigations reporting high percentages of owners who see their animals as family members (Hirschman, 1994; Boya et al., 2012; Tsai et al., 2020). In the studies mentioned, owners more attached to their pets tended to treat their dogs as people and

perceived them as their children and themselves as their parents. After dogs, cats are the companion animals' individuals more frequently have in their homes (Growth from Knowledge [GFK], 2016). Although cat owners viewed their cats as family members significantly less often than dog owners, most owners described their pets as family members (Arañuri et al., 2017). Additionally, when trying to understand how the degree of attachment of Japanese dog and cat owners related to their attribution of emotions to their pets, Su and colleagues (2018) showed that not only dog owners exhibited a higher level of attachment than cat owners but also that higher levels of attachment were associated with a firm attribution of emotions to animals (Su et al., 2018).

Animals self-constitute a different genre of human-pet relationship since they represent an extension of their owner's selves. This happens because the owner projects the pet how he/she wants to be seen. Boya (2012) reported this when firmly attached owners stated that their dogs would be just like them if they were human. This projection is ubiquitous in males who own large, aggressive male dog breeds that are very much against neutering the dog because it represents their virility and masculinity (Hirschmann, 1994).

Regarding the impact dogs have in the day-to-day lives of their owners, besides the unconditional love and companionship dogs provide, they positively impact the owner's health and well-being, possibly explaining part of the evolution of the relationship. A study led by Cavanaugh and colleagues (2007) found that the owners who had their dogs for a longer time and whose relationship was closer reported higher levels of well-being. This suggests that viewing the dog as a household member increases the level of closeness with the dog and positively impacts the owner's well-being. The results of this study are supported by the findings of Payne et al. (2015), which demonstrated that owners who exhibited their affection by kissing their dogs reported higher levels of oxytocin concentration. These levels are crucial to developing the bond between humans and dogs. The study found a bidirectional effect - not only the owner's well-being increased, but the dog's cortisol, which is the stress hormone, concentrations decreased in the presence of a familiar human when the dog was exposed to a new environment (Payne et al., 2015).

On the other side, dogs can impact our social behavior. They do that by making owners interact with different people who otherwise they would not or make people adjust their behavior towards someone because of the presence of a dog. This idea is defended by the study of Guéguen and Cicchetti (2008), in which they proved that a dog's presence positively influenced how people have it. They proved this through an experiment where individuals were

confronted with a stranger asking for money to buy a bus ticket in a mall. On some occasions, that stranger had a dog with him in others, he did not. Participants were more open to social interactions and behaved more altruistically when the dog was present. In this line of thought, results pointed to the fact that dogs enhance social interactions, supporting previous literature (McNicholas & Collis, 2000). Therefore, these investigations proved that the mere presence of a dog increased the frequency of social interactions, especially when the individual was interacting with strangers.

The social value can also explain the dog-human relationship development that dogs bring into our lives. Previous research has suggested that owners could use pets as social lubricants because they help them interact with other people (Veerers, 1985). A study conducted by Beverland and colleagues (2008) found that this type of ownership requires a sense of proprietorship and treating pets as toys. On one side, owners who sought social approval and status recognition acquire "designer breeds", such as Labradoodles and cockapoos, or expensive accessories like diamond-encrusted collars.

Both owner and dog-related factors influence the type and strength of the relationship. In the study developed by Serpell (1996), the author asked owners to compare their "ideal" dogs and their "actual" dogs. The results showed that no owner characterized themselves as having no attachment to their pets and that differences between "actual" dogs and "ideal" dogs were larger in less attached owners. This means owners whose dogs fall short of the expected ideal behaviors are less strongly attached to them (Serpell, 1996).

Another study conducted by Calvo and colleagues (2016) that aimed to identify the perceived bond people have with their dogs was able to distinguish different types of patterns of dog ownership. Owner-related factors were relevant in the quality of the dog-owner bond, such as the owner's maximum level of education had a positive influence on the relationship. This is consistent with previous findings by Dotson and Hyatt (2008) – they found that participants who had been introduced to some level of university education were more likely to see their dogs as companions instead of pets. In their study regarding dog owners' attachment levels, social support, and perceived mental health, Netting and colleagues found that younger dog owners showed higher levels of attachment to their dogs than older owners did.

Furthermore, Meyer and Fokman (2014) found that the owner's perception of emotional closeness to their dog is higher if they have other dogs than the one that was evaluated. This contrasts with the findings of Marinelli et al. (2007), which showed that the amount of care an

owner had for their dog was negatively impacted by the existence of other dogs in the household.

A study conducted by Coy and colleagues (2021) intended to comprehend how owners' attachment anxiety and avoidance levels were good for predicting factors associated with dog and cat obesity, like treat giving, pet weight, or daily interactions. For dogs, the study showed that individuals' levels of attachment anxiety were a good predictor of pet obesity. Owners with higher levels of attachment anxiety were concerned with being negatively evaluated by their pets. That concern led them to increase caregiving behaviors and attentiveness, like treat-giving, which could eventually lead to pet obesity. On the contrary, owners that scored higher on attachment avoidance showed lower factors of pet obesity. Higher levels of attachment avoidance resulted in the tendency to avoid interactions and intimacy, and fewer treats were given daily (Coy et al., 2021).

Dog obesity is related to how owners view and interact with their dogs. Kienzle and colleagues (1998) aimed to understand the feeding behaviors of the owners of obese dogs and compare them to the ones of "normal" dog owners. Obese dogs tended to sleep more on the owner's beds, were more "humanized", and were more often fed kitchen scraps and their owners viewed feeding them as a satisfying and practical way of communicating with them. The fact that owners of obese dogs were often obese themselves could explain those behaviors. Through the extensions of their health and eating habits, owners disregarded the dog's nutritional and health needs, leading them to obesity.

These findings support the discoveries of Jyrinki and Leipamaa-Leskien (2005) that revealed that owners who viewed their pets as extensions of themselves used feeding as a way of giving pleasure to their pets and were more concerned with the price and quality of pet food than owners who did not. Also, a recent investigation developed by Apaolaza and colleagues (2022) on consumer motivations when buying fashion pet clothing showed that the level of attachment to the pet positively influenced the intention of buying fashion pet clothing. The authors explained that by buying fashion pet clothing, consumers were indulging in the humanization, or anthropomorphization, of their pets since, like what happens with humans and their fashion clothes, the functional benefit is no longer the essential characteristic in the purchase decision because fashionable clothing does not bring any additional functional value for the pet (Apaolaza et al., 2022).

## **2.2. Dog Related Spending**

Pet-related expenditures are currently hitting hundreds of billions of dollars annually in the United States of America (USA) (American Pet Products Association, 2021; Economic Research, 2021). Once looking from a global standpoint, we can observe that, for example, just the pet care market is valued at almost 180 billion dollars (Markets, 2021). Taking into consideration the importance and growth of this increasing trend of owners spending more money with their dogs, several authors have studied it and its relation and impact on consumer behaviors (Ridgway et al., 2007; Beverland et al., 2008; Kylkiahti et al., 2015; White et al., 2021).

The way owners spend money on their pets has been displayed to be an interesting approach for investigators to study the identity construction of consumers. Jyrinki (2011) found six different constructs where owners developed their identities around their pet-related consumption: Character Developer, Source of Well-Being, Mean to Connect, Status Communicator, Object of Devotion, and Pet as an Intermediary.

The first construct, Character Developer, illustrates how pet owners' character is tested. In this line of thought, taking care of pets demands a significant amount of time as well as money, and because of it, not only the relationship with the dog is developed, but also the owners develop their self-concepts into someone who comprehends what their pets want and what is best for them (Ramirez, 2001). Gillespie and colleagues (2002) focused on people who participated in serious leisure involving dogs. The authors referenced several examples of such activities as breed shows or agility competitions. This interest in organized dog sports builds more informed owners than the usual pet owners, who make decisions on their behalf because they know what is best for the pet to accomplish their goals. For example, moving to the countryside so the dogs could live more comfortably. A participant reported that even though her husband did not like fences in the yard, they had to install some because of their benefits for the dogs. Another participant reported having thousands of dollars' worth of dog training equipment in the garage (Gillespie et al., 2002). These owners take pride in being more knowledgeable and making the right decisions and accomplishments with their dogs despite some judgment from outside lookers. In this type of relationship, pet owners develop themselves to be subjects that understand best what their demanding pets need and proceed to consume accordingly (Gillespie et al., 2002).

The second construct Jyrinki (2011) identified is the Pet as a Source of Well-Being. In this scenario, the pet becomes the object being consumed since it is the owner's well-being provider.

As previously mentioned, several authors have concluded that dogs positively impact owners' well-being and health (Cavanaugh et al., 2007; Payne et al., 2015). The study developed by Jyrinki (2011) showed that owners reported that pets gave them support in terms of mental health and an incentive to exercise and be outdoors. In a study conducted by Heuberger (2017) that intended to understand the relationship of pet ownership with older adults' health and eating patterns, it was found that owning a pet was associated with fewer health problems and less prescribed medication. These results point to the inherent health benefits pets bring to their owners, in this case, older adults, with dog ownership reporting greater health advantages (Heuberger, 2017).

Moreover, another study conducted by Kylkilahti and colleagues (2015), who intended to understand the roles pets played in how owners consume, found that pets can function as the producer of consumption. In this role, pets generate events for the owners that enhance his/her well-being. This study suggested that this could happen in the form of motivation to engage in physical activities or sports and as a way of providing mental health support. The effects of this role, the pet as a possession that delivers well-being, have been recorded in different studies such as Salmon et al. (2010), in which the authors indicated that dog owners walked and engaged in more physical activities than non-dog owners, and the study of Bao and Schreer (2016) in which pet-owners displayed more life satisfaction than non-pet-owners.

A more recent study by White and collaborators (2021) wanted to comprehend if spending money on pets promoted happiness. The results demonstrated that participants that recalled giving their pets a gift were happier than the ones who recalled spending money on themselves. Furthermore, when the participants were given money to spend either on their pets or themselves, those who spent on their pets reported higher levels of happiness than the ones who spent on themselves. These studies demonstrated that the presence of a pet makes the owners engage in consumption experiences that enhance his/her well-being. It happens either when they use the pet as the object of consumption, as a provider of mental health support, as a promotor of physical activities or when they consume the pet when buying treats, toys, or presents (White et al., 2021)

The third construct involves pets as a Mean to Connect (Jyrinki, 2011) with different species, nature, and/or other pet owners. For these owners, the type of bought products is focused on improving the relationship with the pet and the strength of the connection, such as incentive toys and dainty food. This is emphasized by the special connection dog people create among themselves and how meaningful that is when they meet other dog owners every time.

This concept follows the same line of thought of two out of the seven themes Holbrook and colleagues (2001) described. They reflect the opportunities dogs bring to their owners, such as strengthening bonds with other human beings or appreciating nature and experiencing wildlife.

The fourth way pet-related consumption can be exploited is by using the pet as a Status Communicator. This construct defends that the pet can be helpful to build up an external image of the owner to society – the line of thinking is that external opinions are important, and the perception that other people have of the pet is translated into the perception they have of the owner (Jyrinki, 2011). The way pet owners consume to get attention and awareness from external environments can involve the breed of the pet itself or the purchase of items like food, toys, and pet clothing that could make people associate a certain status from the pet to the pet owner (Beverland et al., 2006). Beverland and associates (2006) conducted this study focused on the negative side of pet ownership through interviews with pet owners, such as owning specific designer breeds or buying dog products that only benefit the owner and not the animal.

This study emphasized some owners' criteria when choosing their dogs, such as cuteness, appearance, or as a "good-looking pug". Additionally, some participants also detailed that they had purchased various dog breath fresheners to improve the breadth of their pugs. This type of consumer behaviour was also narrated in the study of Ridgway and colleagues (2007), who aimed to understand if the tendency to excessive buying for oneself also translated into excessive buying for pets. The results from this study showed a positive relationship between owners' excessive buying for themselves, the total pet spending, and the frequency of the purchases. It also emphasized that owners who indulged in excessive buying behaviours spent almost double the amount compared to non-excessive buyers. These excessive buying owners reported that overspending on their pets meant they took better care and made them feel better about themselves (Ridgway et al., 2007).

The fifth construct was called by Jyrinki (2011) the Object of Devotion. The study explained that it englobes all pet-related consumption, allowing owners to cultivate their identity through emotional attachment to their pet. An example of consumer behaviour that displays this construct is buying a new car to better transport the pet or making changes to the house exclusively because of the pet. This concept is based on the trend of anthropomorphizing pets, which was already described and mentioned before in this literature review.

When owners humanize their pets, they tend to see themselves as the pet's caregivers and protectors (Hirschamn, 1994; Topál et al., 1998; Holbrook et al., 2001; Payne et al., 2015), which translates into consumption actions that may not be rational. This construct also emerged

in the study of Brockman and colleagues (2006) – the study reviewed how consumers made decisions when facing expensive healthcare treatments for their pets. The investigation found that for consumers devoted to their pets, who viewed them as cherished others or as perpetual babies, the decision was always to pursue the medical treatment, despite the recovery expectations or financial sacrifices they had to make. However, for less attached owners, the decision was different. Since the pets were perceived as possessions with a low level of attachment, the decision was primarily made based on the financial costs it brought. Moreover, a group of owners was the middle ground between the two previous groups. This group can be defined as owners attached to the pets that consider them as family members but do not refer to them in a spiritual context and reasonably make health care decisions. The decision was based on a balanced equation between financial costs, expectations regarding recovery, and their attachment to the animal (Brockamn et al., 2006).

Another study conducted by Boya and colleagues (2014) showed the previous idea, but this time regarding dog food. The study aimed to apprehend the different types of dog owners by segmentizing them based on key dimensions of anthropomorphism, understanding the dog food selection criteria, and comprehending the similarities between purchasing food for themselves and their dogs. The results showed that segmentizing owners based on the dog-owner relationship were valid and that different levels of the dog-human bond produced different criteria for choosing dog food. For example, more attached owners scored higher on the importance of health, nutrition, and quality than less attached owners. Also, another discovery was that the importance of dog food price was not significantly different amongst the different levels of the dog-human bond.

An additional study found that people who were more likely to identify with their dog tended to evaluate a product package with a dog on it in a more positive manner when compared to people that were less likely to identify with their dog (Par & Kim, 2020). Additionally, for owners of obese dogs, the availability of commercial dog food in the nearby store was more important, so much that Kienzle and colleagues (1998) found that premium or better-quality food was not fed more often to obese dogs. On the contrary, obese dog owners considered more important low-price food than ordinary dog owners (Kienzle et al., 1998). Different owners, with diverse attachment levels, have distinctive decision-making processes concerning consumption decisions for their pets. Furthermore, the way owners decide is transversal to different categories of consumption experiences, as we observed in healthcare treatments (Brockamn et al., 2006) or feeding the pet (Kienzle et al., 1998; Boya et al., 2014).



The last construct was defined as an Intermediary, in which the pet is perceived in a non-emotional way. One common way consumers have pets as intermediaries are by tolerating their presence in their lives on behalf of others like family members, a spouse, or friends. For example, in the study by Jyrinki (2012), one participant stated that they only tolerated their pet because his family loved the cat. Regarding consumption decisions, intermediary owners have low involvement, are price-oriented, and seek convenience when shopping for the pet. In this line of thinking, pet products are bought as cheaply as possible, sometimes even by accident, or made using homemade food and toys. For some owners, the possibility of choosing from several brands and price points is nonexistent due to their financial problems. A recent investigation conducted by Arluke (2021) studied pet food insecurity and found several mechanisms developed by these owners. For instance, when facing this problem, one coping strategy was "Sacrificing". It is best described as a way for owners to feed their dogs by being willing to make financial sacrifices, like buying cheaper and worse food for themselves or giving a portion of their food to the dog.

### **2.3. Dog Feeding and Alternative Diets**

Dog owners are spending extra quantities of money on their pets and where they spend the most money, besides vet services, is on dog food (GFK, 2016; Pet Industry Market Size, Trends & Ownership Statistics, 2022). It has been shown in studies above mentioned the importance of food in the relationship between dog and dog owner (Kienzle et al., 1998; Jyrinki, & Leipamaa-Leskinen, 2005; Boya et al., 2014). Although commercial dog foods are still the most purchased and fed, new trends in dog diets are becoming relevant in the sector.

In 2017 around 10% of dog owners abandoned traditional commercial diets for alternative diets that are gaining much following, like plant-based foods or raw meat diets (Vandendriessche et al., 2017). This shift in preferences could be explained in part by the increasing concern consumers have regarding their environmental impact and how conscious they are regarding what they feed their pets and the availability of information on the internet. Also, the 2007 pet food crisis, which led to the death of several dogs, had a negative impact on the perception and increased distrust of dog owners regarding some major dog food brands like Purina, Hills, and Eukanuba (Lancendorfer, 2014). To be able to respond and fulfil owners' requests, some studies in the academic field have studied the pros and cons of these new diets.

In a study developed by Parr and Remillard (2014), alternative diets were described "to encompass the dietary options available to pet owners today that are not commercially

manufactured kibble or canned foods with a nutritional claim of complete and balanced". These alternatives include homemade, natural, or human-grade foods, plant-based or vegetarian, and raw food diets (Michel, 2006; Wambacq, 2017). One of the owner's biggest concerns about commercial kibble is its processed ingredients. A key argument that owners, who feed homemade diets to their dogs, make in favour of homemade diets is that when they make their dogs' food, they assure of the quality of the ingredients (Morgan et al., 2017). However, there are some drawbacks regarding this dietary option. Formulating a proper and complete pet food requires special knowledge that most owners do not possess, with several reports of malnutrition in pets fed homemade food (Roudebush & Cowell, 1992; Niza et al., 2003; Michel, 2006; Parr & Remillard, 2014).

A survey by Just Right Purina in 2015 aimed to understand the main concerns dog owners had about their dog's health and wellness and to comprehend their decisions on dog food. This study was conducted with 900 dog owners in the United States of America in September 2015. The study found that nearly 50% of dog owners stated that choosing the food for their dogs was the most challenging part of pet ownership. Furthermore, 52% of the sample agreed that dog nutrition is more puzzling than human nutrition - this percentage increases in millennial pet owners (about 68%), and 50% acknowledged that they often think about their dog's diet. 70% of the participants reported that the food selected for their dog fits into the dog's need, but not perfectly. Also, 25% of the sample described that the number of choices available was tremendous and overwhelming. 25% explained that they spend more than 10 minutes deciding between different products, brands, tastes, and combinations - this percentage increases in millennial pet owners (about 37%).

A recent survey conducted by the Association for Pet Obesity Prevention (APOP) (2021) with 865 pet parents and veterinary professionals between October and December 2021 found that there was enormous concern about pet obesity as it was considered a disease by 72% of pet's owners and 87% of veterinary professionals. Regarding the food choices, the leading preferences included "no by-products" (29%), "high in protein" (28%), products made in the USA (28%), and "grain-free" (25%) (APOP, 2021). Additionally, 39% of dog owners considered their pets overweight or having obesity, contrasting with reports of over 50% of dogs and cats being overweight.

It is also relevant to reflect on the pandemic period and the changes in behavior patterns concerning pet purchases. This survey found that 27% of pet owners stated getting on extra walks with their dogs, and 23% stated they offered more treats. 17% of the sample declared

they altered pet food brands during the pandemic. The survey found that 15% of pets displayed behaviour changes, and 7% of the sample planned more home-cooked meals for their pets (APOP, 2021).

Moreover, 38% of dog owners agreed that grain-free diets were unhealthy for their pets. Likewise, 77% of dog owners acknowledged they fed dry pet food "exclusively" or "most of the time". Canned foods were consumed "exclusively" by 11%, and 17% of dog owners responded, "most of the time". Finally, 13% of dog owners said they supplied "fresh commercial" food "exclusively" or "most of the time". Raw diets (both commercial and home-prepared) and homemade pet foods were "never" fed to over 61% of dogs.

A study conducted by Dodd and colleagues (2020) intended to analyze dog feeding habits between 2008 and 2018 in the English population. 51% of the sample had only dogs as pets, and although 78% of the dogs were fed conventional, only 13% consumed exclusively conventional foods. Additionally, 8% of the dogs had prescription diets. Regarding the consumption of unconventional diets, only 9% said to exclusively feed a diet of Raw Animal Products (RAP). An even smaller number of owners said they gave their pets only vegetarian foods, although 22% of the sample incorporated these into the diet in some way these types of foods.

It is also interesting to understand the differences between geographies. In Australia, it was more prevalent to feed exclusively Homemade and RAP foods; the US was the geography with the highest value for Inclusive Conventional, and although New Zealand had a high prevalence for conventional inclusive feeding behaviors, it was also one of the highest geographies in terms of owners feeding RAP exclusively.

Furthermore, the same problem exists with raw food diets. These are diets where the ingredients, especially meat, are served to the pet uncooked. Advocates of this option state that it brings health benefits, like shinier coats, cleaner teeth, increased muscle mass, and helped with preexisting conditions (Morelli et al., 2019; Empert-Gallegos et al., 2020). Demand for raw meat diets has increased over the last few years, making them very popular among pet owners. However, there is a risk associated with these diets, with the existence of salmonella, if they are not cooked properly. The study by Withenshaw et al. (2020) showed that the number of plants licensed to manufacture raw meat pet foods increased from 21 to 42 between 2011 and 2015, reaching 109 plants in 2018. Also, the number of salmonella isolations, from raw meat diets, in said plants increased, rising from 3 plants in 2008 to 37 in 2018. If in certified plants, salmonella isolations are not that uncommon as seen above, pet owners providing their

pets with homemade raw meat diets may contribute to the spread of these bacteria and put at other pets and humans.

Another argument in favor of raw meat diets is that dogs have evolved from wolves and ate raw meat centuries ago, so this diet is a way for owners to keep the wild nature of their dogs active (Michel, 2006). Morgan and colleagues (2017) conducted a report about owners' motivations for feeding raw animal products to their pets. The most common reason dog owners chose a raw diet was that it was healthier and more natural. Despite these beliefs, there is a lack of evidence in the literature that supports those statements. The problem with this type of diet is beyond pet nutrition, though the risk of it is still accurate. The significant concerns regarding that type of diet related to the possibility of dogs who are fed raw animal products develop infections from pathogenic bacteria and the transmission of antibiotic-resistant organisms to humans (Lenz et al., 2009; Leonard et al., 2011; Freedman et al., 2013; Dodd et al., 2020).

Moreover, with the humanization of pets, trends in the pet food market have developed the propensity to mimic human food movements (Altitude Marketing, 2020), and with the growing quest by humans to consume more natural foods, another growing pet food segment is the natural, or holistic, pet foods (Business Wire, 2021) The European Pet Food Industry Federation (FEDIAF) (2011) states that

*"The term "natural" should be used only to describe pet food components (derived from plant, animal, microorganism, or minerals) to which nothing has been added and which have been subjected only to such physical processing as to make them suitable for pet food production and maintaining the natural composition."* (FEDIAF, 2011).

As stated before, consumers pay more attention to what is in their pet's bowl. They consider additives, synthetic ingredients, or preservatives to be not natural. Furthermore, it was pointed out by consumers that they considered pet food to be natural when they believed it to be high in protein, more expensive and when it was not available at the supermarket (Swanson, 2010). Lastly, another more recent trend is plant-based pet food (Evans, 2022). The proteins in these pet foods come from plants instead of meat or meat byproducts, as in most other pet foods. The drivers for this trend are owners' vegetarian or vegan diets, their ethical beliefs, and their concern regarding the environmental impact of pet food (Fox & Ward, 2008; Dodd et al., 2019; Salehi et al., 2020). When dog owners are vegetarian or vegan, that could lead to a moral predicament for the owner. It is called the vegetarian's dilemma, in which the pet owners are vegetarian or vegan, but most pet foods they have available to them have meat as the major

source of protein. They see themselves in a dilemma since they abstain from eating meat, but they feed their pets food that has meat (Rothgerber, 2013).

When studying the perception of the health of dogs fed meat-based diets versus plant-based several conclusions were made. Around 30% of respondents stated that they fed their dogs a plant-based diet (Dodd et al., 2022), a greater number than previously reported in other pet diet-related studies (Dodd et al., 2019; Knight et al., 2022). Like dog owners who feed raw meat diets to their dogs, owners who feed plant-based diets rely more on information found on the internet than information from their veterinarian (Kierner, 2019; Morgan et al., 2019). This supports claims that the internet is a propeller for these types of alternative diets. Although the rise in popularity and availability of these diets, the concern regarding their nutritional adequacy has also risen. Several studies have found plant-based pet foods to be frequently not nutritionally complete and balanced. (Kanakubo et al., 2015; Zafalon et al., 2020).

We can observe that this theme is current and relevant. Dogs are increasingly occupying an intimate role inside owners' circles. That intimacy propels the owners, conscious or unconsciously, to behave differently than they would if they did not have a dog. This can be seen in how they make purchases for the dog, especially in the item they spend the most money on dog food. In this line of thought, this study intends to comprehend what motivates dog owners when they are faced with the choice for their dog's food, if their relationship impacts that decision and if trends of new alternative diets are relevant and have chances of succeeding in the future.



## **Chapter 3 - Methodology**

### **3.1. Conceptual Map and Hypotheses Formulation**

#### **3.1.1. Conceptual Map**

This model represents an overview of this dissertation's purpose and the study's hypotheses. We have suggested a conceptual framework relating the level of the dog-human bond and the consumer behaviour of the owners. Its importance has also been shown by how it has progressively been considered and studied by different authors, allowing us to understand consumers and their behaviours better. This last aspect is very important for academic purposes and companies that operate in this market.

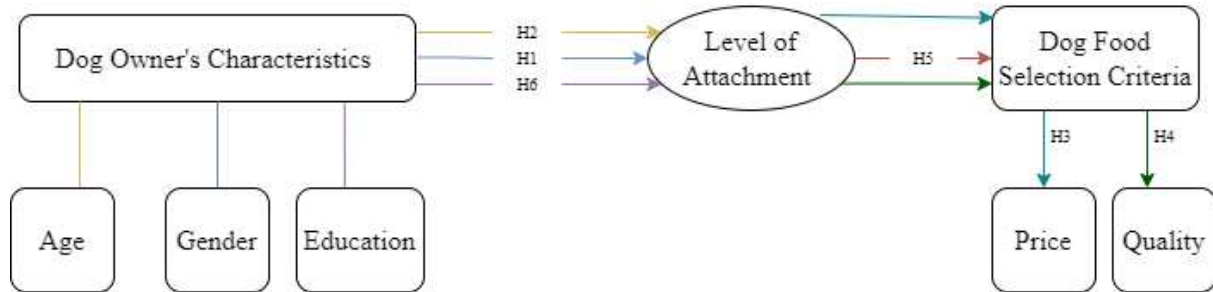
The new role of dogs in consumers' daily lives has made them alter their behaviours, including how they contemplate and prioritize purchases related to their dogs. The technological advancements of the last two decades have also allowed these owners to reach amounts of information that previously were only accessed via books or veterinarians, further developing their capabilities of commitment and investment in their pets. It is increasingly more difficult for companies to communicate with these new owners. Considering that it is paramount to have a deeper understanding of the influences of their purchase behaviours.

To make more comprehensible the relationship between the level of attachment of the dog-human bond, owners' sociodemographic characteristics, and the selection criteria of dog food this model has been developed and inspired by the literature review. There are three main concepts in the model: dog-human bond (level of attachment of the dog-human bond), sociodemographic characteristics (age, gender, and education level), and dog food selection criteria (importance of price, the importance of quality and overall importance of the selection criteria).

Below is presented the designed model, with the hypotheses that will be described in the next section.

**Figure 1.**

*Conceptual Map*



Source: Cohen (2002); Dotson & Hyatt (2008); Boya et al. (2014); Calvo et al. (2016).

### 3.1.2. Hypothesis Formulation

Some hypotheses were created to verify how the dog-human bond affected the criteria for choosing dog food. Based on the conceptual framework presented before, the development of the hypotheses was based on previous literature and is fundamental to comprehending the impact of dog-human bonds and sociodemographic characteristics on the food selection criteria.

#### **Hypothesis 1: Women Are More Attached to Dogs than Men.**

Studies showed that women were more likely to be more attached to dogs than men (Cohen, 2002; Dotson & Hyatt, 2008). It is expected that the results from this study will go accordingly to the findings of these previous studies. Dotson and Hyatt showed that women outscored men in all the dimensions of their study, from anthropomorphic to symbiotic and Cohen (2002) found that one of the most influential factors in studying intimacy with pets was the owner's gender.

#### **Hypothesis 2: Younger Generations Are More Attached to Their Dogs than Older Generations.**

A generational difference could explain the increased involvement of dogs in the lives of owners in how they view their dogs. Owners under 35-year-olds scored the highest in the Symbiotic dimension, and over 65 scored the lowest in the Anthropomorphism dimension. Overall older owners scored lowest on all dimensions (Dotson & Hyatt, 2008). This is



supported by Netting and colleagues (2013) findings, which concluded that younger owners had a stronger attachment to their dogs than older owners.

**Hypothesis 3: More Attached Owners Are Less Price Conscious Than Less Attached Owners.**

Regarding purchasing decisions, one of the most influential factors is price. Brockman and colleagues (2008) studied how different pet owners made decisions regarding high-priced medical care for their pets. Their study demonstrated that the type of relationship owners had with their pets altered the type of decision made when confronted with the possibility of costly medical treatment. Also, more attached owners made emotionally oriented decisions and often did not consider the costs, while less attached owners were more logical, and the price was fundamental in the decision made. Price was listed as the third most important factor when choosing dog food (Banton et al., 2021).

**Hypothesis 4: More Attached Owners Emphasize the Quality of Dog Food than Less Attached Owners.**

The quality of pet food products has gained importance in the last few years. The 2007 pet food crisis, which led to the death of several dogs and cats, is one of the many drivers of that increased importance. Boya and colleagues (2014) found that the Dog people segment with higher levels of attachment was more concerned with quality than the other segments (Boya et al., 2014). A study on how consumers choose pet-related services showed that the group of owners that scored highest on attachment was the one who gave more emphasis on service quality (Chen et al., 2012). Another study was able to support these findings regarding the purchase of pet food. Owners who were part of the extended-self group, i.e., that viewed their pets as an extension of themselves, emphasized quality more than the owners in the non-extended-self group (Jyrinki & Leipamaa-Leskinen, 2005).

**Hypothesis 5: There is a Significant Difference Between More Attached and Less Attached Owners Regarding Dog Food Selection.**

Many dog owners view feeding their dogs as a way of communicating with them and caring for them (Chen et al., 2012). Several studies have shown that different dog-human dyads have different ways of dealing with the feeding of the dog (Jyrinki & Leipamaa-Leskinen, 2005; Boya et al., 2014). In the study conducted by Boya and colleagues (2014), different segments

of owners had different priorities regarding numerous criteria, while Jyrinki's and Leipamaa-Leskien (2005) found that owners who believed their dogs to be an extension of themselves had different pet food consumption patterns. Therefore, the fifth hypothesis is that there are significant differences between more attached owners and less attached owners regarding their dog food selection criteria.

**Hypothesis 6: People with Higher Degrees of Education are More Attached to Their Dogs than People with Lower Degrees of Education.**

The level of education has been associated with pet attachment. Studies have shown that the higher the level of education, the higher the attachment owners have with their pets (Dotson & Hyatt, 2008; Calvo et al., 2016). Calvo and colleagues (2016) study aimed to explore the different dog ownership patterns one of the variables significantly associated with Group 1, the group with the highest attachment levels, was the level of education of the owner. This hypothesis was developed with the expectation that individuals with higher levels of education are more attached to their dogs than individuals with lower levels of education.

**Table 1.**

*Hypothesis Description*

<b>Hypothesis</b>	<b>Description</b>	<b>Based on</b>
H1	Women are more attached to their dogs than men.	Cohen (2002); Dotson & Hyatt (2008).
H2	Younger generations are more attached to their dogs than older generations.	Dotson & Hyatt (2008); Netting et al. (2013).
H3	More attached owners are less price-conscious than less attached owners.	Brockman et al. (2008); Banton et al. (2021).
H4	More attached owners emphasize the quality of dog food more than less attached owners.	Jyrinki & Leipamaa-Leskinen (2005); Chen et al. (2012); Boya et al. (2014).
H5	Regarding dog food selection, there is a significant difference between more attached and less attached owners.	Jyrinki & Leipamaa-Leskinen (2005); Chen et al. (2012); Boya et al. (2014).

H6	People with a higher degree of education are more attached to their dogs than people with lower degrees of education.	Calvo et al. (2016); Dotson & Hyatt (2008).
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Considering that the present dissertation aims to analyze the relationship between the attachment of the dog-human bond, the consumer behaviour, and the sociodemographic characteristics of their owners, a quantitative study was conducted. This investigation presents a quantitative methodology, which means that we tested objective theories and hypotheses by examining the relationship between several variables (Creswell, 2008). The deductive reasoning of this study focused on establishing a hypothesis inspired by the scientific literature and collecting data to answer the research questions and objectives. This is a quantitative and correlational research because we aimed to clarify the relationship between two variables using statistical data – the variables were not manipulated. The variables in the study are Sociodemographic, Dog-Human Bond, and Dog Food Selection Criteria. It is important to mention that the dog-human bond, in this research, is measured and explained by the level of attachment. The data was collected through a structured questionnaire with closed questions. The purpose of a survey research is to generalize from a sample to a population so that inferences can be made about consumer behaviours of the dog-owners population (Babbie, 1990). We chose to use a survey because it is a rapid turnaround in data collection, and there is an advantage in identifying attributes of a large population from a small group of individuals (Babbie, 1990). This study is cross-sectional, meaning that the data was collected at one point between the 19th of October and the 23rd of October.

### 3.2. Target Population

The target population selected for this study are Portuguese people, more than 18 years old, that live in Portugal and speak Portuguese. Also, the population selected for this study cohabits with at least one dog and is responsible for selecting and purchasing dog food. The sample collected for this study is a random sample, which means that everyone in the population has an equal probability of being selected – this will allow us to have a representative sample from this population and provides the ability to generalize to the population.

### 3.3. Sample Size and Sampling Methods

The sample size was computed under the hypothesis that the percentage of individuals with high attachment is equal to 50% (we do not know the real proportion since no studies exist on the subject in Portugal). This proportion of 50% gives the maximum sample size in the formula below; we consider a 95% confidence level ( $\alpha=5\%$ ) and a 3% margin of error (E):

$$n = \frac{1.96 p(1 - p)}{E^2}$$

n= 1068 individuals

The minimum sample size required for the study is 1068 individuals.

### 3.4. Data Collection

To collect the data, an online questionnaire was created and developed. The questionnaire was developed and put online via Qualtrics, an online survey software. The questionnaire was written in Portuguese, given that it is the language of the target participants. It was distributed online on the 19th of October and closed on the 23rd of October. It was shared with the participants via WhatsApp, Instagram, LinkedIn, and Facebook groups.

### 3.5. Questionnaire Construction

The questionnaire is divided into four different sections, with a total of 56 questions. The first section is a sociodemographic set of questions created to collect relevant information about the participants to comprehend and contextualize the content of the survey. Some questions on the sociodemographic questionnaire include age, gender, professional situation, number of pets, education level, and area of residence.

The second section is composed of questions regarding the dogs' characteristics. These questions intend to allow us to characterize the dogs and to give further understanding and contextualization of the dog-owner relationship with open-ended questions.

The third section comprises the Lexington Attachment Pets Scale (LAPS). It is a quantitative instrument developed and validated by Johnson and colleagues (2015). This scale is not validated for the Portuguese population. The research team of the current study translated the items into Portuguese. The questionnaire asks the participants to answer 23 items accordingly with their degree of agreement. Some items examples included: "My pet means

more to me than any of my friends"; "I believe my pet is my best friend"; "I think my pet is just a pet"; "My pet knows when I'm feeling bad". The answers varied from 0= strongly disagree; 1=somewhat disagree; 2=somewhat agree and 3= strongly agree. This scale revealed excellent psychometric properties, and the internal consistency of the scale was moderate.

The fourth and final section of this questionnaire is composed of a set of 12 items regarding dog food selection criteria. On the questionnaire, participants were asked to answer according to the degree of importance of the criteria. The 12 items have been adapted from the research of Boya et al. (2014), in which the authors developed a questionnaire with a set of 18 items whose objective was to measure the importance of dog food selection criteria. Some examples of criteria items are "Price"; "Quality of ingredients"; and "Being recommended by a family member/friend". The Likert scale used was the five-point Likert scale (Not important at all = 1; Very important = 5) (Boya et al., 2014).

### 3.6. Research Objectives

**Table 2.**

*Research Objectives, Research Questions, and Instruments*

<b>Research Objectives</b>	<b>Research Question</b>	<b>Instrument</b>
To analyze the difference between gender and level of attachment in the dog-human bond.	Is there any difference between women and man in the attachment level in the dog-human bond?	Sociodemographic Questionnaire Lexington Attachment Pets Scale (Johnson et al., 2015)
To comprehend the relationship between age and level of attachment in the dog-human bond.	What is the relationship between age and the level of attachment in the dog-human bond?	Sociodemographic Questionnaire Lexington Attachment Pets Scale (Johnson et al., 2015)
To explore the relationship between the level of attachment in the dog-human and the importance of dog food price.	What is the relation between the level of attachment in the dog-human bond and the	Lexington Attachment Pets Scale (Johnson et al., 2015) Dog Food Selection Criteria Questionnaire

	importance of the price of dog food?	
To investigate the relationship between the level of attachment in the dog-human bond and the importance of the quality of dog food purchased.	What is the relationship between the level of attachment in the dog-human bond and the importance of the quality of dog food purchased?	Lexington Attachment Pets Scale (Johnson et al., 2015) Dog Food Selection Criteria Questionnaire
To study the relationship between the level of attachment in the dog-owner bond and dog food selection criteria.	Is there any relationship between the level of attachment in the dog-owner bond and the dog food selection criteria?	Lexington Attachment Pets Scale (Johnson et al., 2015) Dog Food Selection Criteria Questionnaire
To analyse the relationship between the level of attachment in the dog-human bond and owner's level of education.	What is the relationship between the level of attachment in the dog-human bond and the owner's education level?	Sociodemographic Questionnaire Lexington Attachment Pets Scale (Johnson et al., 2015)

## Chapter 4 - Results

### 4.1. Procedure

After closing the questionnaire in *Qualtrics*, 1229 responses were extracted from there and submitted to the *IBM SPSS Statistics 28* program. In total, only 971 were considered valid, considering the existence of incomplete responses.

### 4.2. Data Analysis

#### 4.2.1. Sociodemographic Analysis

The data used in this study were collected between the 19<sup>th</sup> and 23<sup>rd</sup> of October 2022. A total of 1229 participants were recruited in Portugal. Of the 1229 participants, 258 were not included in the study because they did not agree with the consent form or did not conclude the questionnaire. The final sample consists of 971 participants. Table 3 shows the participants' socio-demographic characteristics with absolute and relative frequencies.

**Table 3.**

*Sociodemographic Characterization*

Variable	Variable classification	Absolute Frequency	Relative Frequency (%)
Gender	Female	794	81.8
	Male	177	18.2
Age	18-25	150	15.4
	26-35	245	25.4
	36-45	212	21.8
	46-55	226	23.3
	56-65	113	11.6
	65+	25	2.6
Education Level	Basic School	21	2.2
	High School	211	21.7
	University Education	739	76.1
Region of residence	North	149	15.3
	Centre	565	58.2
	South	249	25.6
	Islands (Azores & Madeira)	8	0.8
Monthly Income	<1000€	324	33.4

	1000€-2000€	445	45.8
	2000€-3000€	107	11
	3000€-4000€	54	5.6
	>4000€	41	4.2

The sociodemographic variables analysed were **gender, age, education level, geographic area, income,** and the **number of dogs owned** since they were the more relevant ones (*to analyse all social demographic variables, you can find the complete table in the Annex 5*) Among the 971 participants, (18,2%) were male and (81,8%) were female. Concerning participants' age, 150 (15,4%) participants were between 18 and 25 years old, 245 (25,4%) were between 26 and 35 years old, 212 (21,8%) were between 36 and 45 years old, 226 (23,3%) were between 46 and 55 years old, 113 (11,6%) were between 56 and 65 years old and 25 (2,6%) participants were over 65 years old. Regarding their education level, 21 participants (2,2%) had Basic School has their highest level of education, 211 (21,7%) attended High School, followed by 739 (76,1%) who had University level diplomas, meaning Bachelor's, Masters or Ph.D. degrees. When observing the data relative to participants' area of residence, we saw a minority, only 8 (0.8%) responses from the Island of Azores and Madeira. The other 963 participants were distributed throughout the Portuguese mainland in the following manner, 149 (15.3%) participants were from the North, 565 (58.2%) lived in the Centre of the country, and 249 (25.6%) were in the South of Portugal. Regarding participants' monthly income, the questionnaire data showed that 324 (33.4%) earned less than 1000 euros per month, almost half of the participants, 445 (45.8%), earned between 1000 and 2000 euros, 107 (11%) earned between 2000 and 3000 euros, 54 participants earned between 3000 euros and 4000 euros and finally 41 (4.2%) participants earned more than 4000 euros.

#### 4.2.3. Dog's Characteristics Analysis

In this section, we briefly describe the dog's characteristics of our sample. Regarding the first question: "*How many dogs do you have?*" of the 971 total responses obtained, the number of dogs from the participants ranged from 1 to 6, with a median of 1 dog (*To analyse all social demographic variables, you can find the complete table in the Annex 6*).

Concerning the sex of the dog, 54.8% were male and 45.2% were female. Regarding the breed of the dogs, the most common response was mixed breed (28.5%), Labrador Retriever (10.2%), Beagle (5.7%), Bouvier Bernois (5.1%) and Miniature Schnauzer (4.5%) (See Annex



2). Concerning the age of the dogs, 8.7% were less than one year old, 36% were between one year and three years, 35.3% were between 4 and 8 years and 20% were more than 8 years old. For the question: “*Is your dog neutered?*”, 53.3% of the sample answered “Yes” and 46.7% “No” and for the question: “*Where did your dog come from?*”, 5.7% answered from the kennel, 43.7% from a breeder, 19.6% from friends or family, 26.9% were rescued and 4.2% answered “other”. Concerning the dogs diet composition, 83,3% answered dry kibble, 4.4% barf diet/raw food, 2.7% homemade food, 2.3% of the participants answered, “Wet Food” while 7.2% responded “other”. Concerning the monthly expenditure of the owners on their dog’s food, 2.5% reported spending less than 10€, 13.0% reported spending between 10€ and 20€, 19.3% spent between 20€ and 30€, 15.2% spent between 30€ and 40€, 18.0% reported expenditures between 40€ and 50€ while 32.0% stated a monthly expenditure on food above 50€.

**Table 4.**

*Diet Composition of the Dogs*

	N	%
Wet food	22	2.3
Dry kibble	809	83.3
Barf diet/raw food	43	4.4
Human food scraps	1	.1
Homemade food	26	2.7
Other	70	7.2
Total	971	100.0

### 4.3. Hypothesis Testing

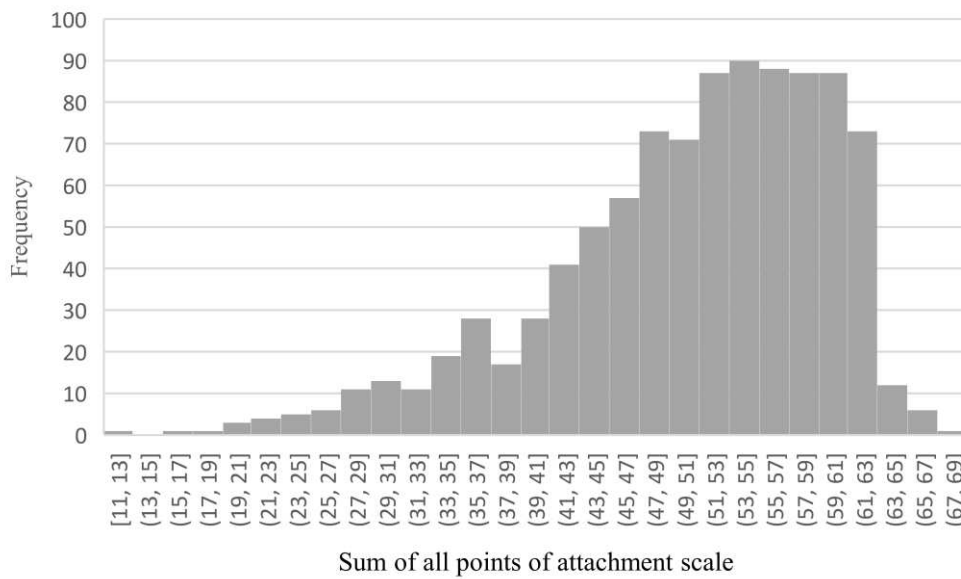
#### 4.3.1. Data Analysis

Preliminary analyses were performed to ensure no violation of the assumptions of normality. The normality of the variable Attachment, represented by the total sum of points of

the attachment scale, was tested by applying a Kolmogorov-Smirnov statistic (See Table 5). The result, with a p-value  $<.001$ , suggested that the variable probably does not follow the Normal distribution and that non-parametric tests are more adequate. Additionally, Cronbach's alpha coefficient was used to verify that the data measured by the scales was of good quality. For the reliability to be accepted, the value of Cronbach's alpha must be more than or equal to  $.7$ , ranging from 0 to 1. The Cronbach's alpha coefficient value was  $.875$  (See Table 6), confirming the consistency of the scale and its reliability. We also organized the sum of All Points of the Attachment Scale into three different groups: Low-attachment, Medium-Attachment and High-attachment, according to the sum of the points of the respective scale.

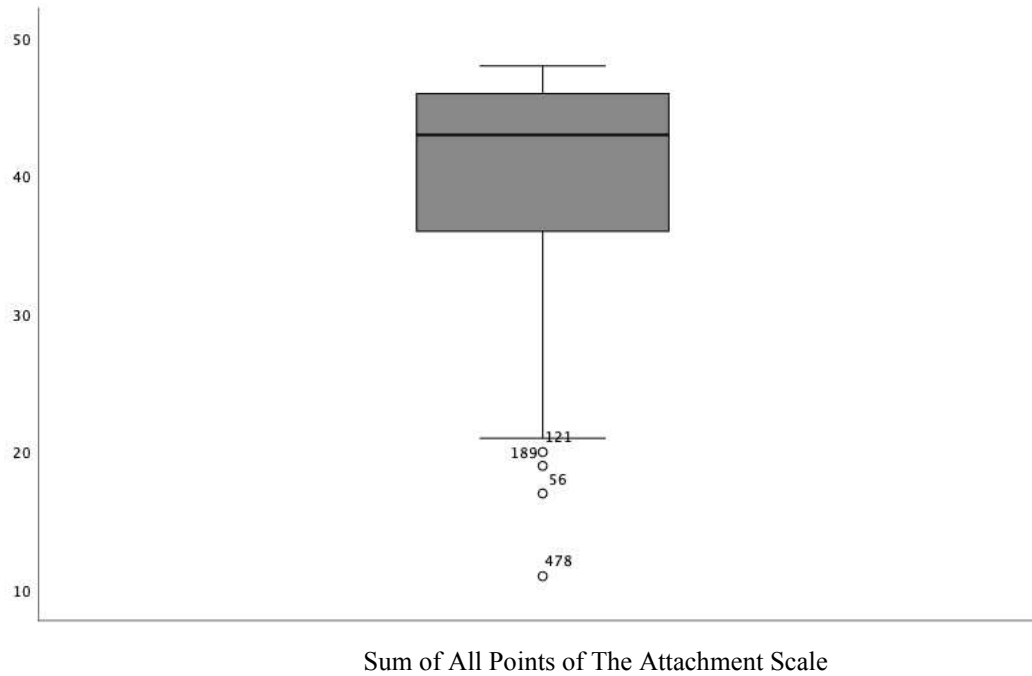
**Figure 2.**

*Histogram of Sum of All Points of the Attachment Scale*



**Figure 3.**

*Box Plot of Sum of All Points of the Attachment Scale*



**Table 5.**

*Tests of Normality of Sum of All Points of the Attachment Scale*

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Sum of All Points of Attachment Scale	.097	971	<.001	.940	971	<.001
a. Lilliefors Significance Correction						

**Table 6.**

*Reliability Analysis of Sum of All Points of the Attachment Scale*

	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of items
Sum of All Points of Attachment Scale	.875	.898	23

**H1: Women Are More Attached to Their Dogs Than Men**

We applied the Mann-Whitney U Test to examine the differences between the independent groups, Female and Male, and the continuous measure of Attachment Level. There was a p-value < 5%, meaning that the median level of attachment is different between males and females. We found that females are more attached to dogs than men because the median is higher for women than for men. This means that the first hypothesis is validated (See Table 7).

**Table 7.**

*Test Statistics of Sum of All Points of the Attachment Scale and Gender*

	Sum of All Points of Attachment Scale
Mann-Whitney U	48342.500
Wilcoxon W	64095.500
Z	-6.503
P-Value	<.001
a. Grouping Variable: Gender of participant	

**H2: Younger Generations Are More Attached to Their Dogs Than Older Generations**

The Kruskal Wallis test statistic was applied to test the differences in the median level of attachment to their dogs between age groups (18-25, 26-35, 36-45, 46-55, 56-65, and 65+). Results suggested that there was a significant difference (p-value < .001). The median of the groups 18-25 years old and 26-35 years old was 55, for group 36-45 years old was 52, for group 46-55 years old was 50, for group 56-65 years old was 49 and for group 65+ years old was 48 (See Annex 7). The median level of attachment of the dog-human bond of the different age groups decreased as the age group increased. With this information, we conclude that younger generations are more attached to their dogs than older generations, this means that the second hypothesis is validated (See Table 8).

**Table 8.**

*Test Statistics of Sum of All Points of the Attachment Scale and Age*

	Sum of the Attachment Scale
Kruskal-Wallis H	47.051
df	4

P-Value	<.001
a. Kruskal Wallis Test	
b. Grouping Variable: Age of participant	

**H3: More Attached Owners Are Less Price Conscious Than Less Attached Owners**

The relationship between the importance of price and level of attachment was investigated using the Spearman product-moment correlation coefficient. We did not find a significant relationship between the importance of price and level of attachment,  $r_s = -.043$ ,  $p = .185$  (See Annex 7). Based on these results, no relationship exists between level attachment and price-conscious; the third hypothesis is invalid in our sample.

**H4: More attached owners emphasize the quality of the dog food more than less attached owners**

The relationship between the importance of the quality of the ingredients of dog food and the level of attachment was investigated using the Spearman product-moment correlation coefficient. We found a positive and significant relationship between the importance of the quality of ingredients of dog food and the level of attachment,  $r_s = .238$ ,  $p < .001$  (See Annex 8). Based on these results, more attached owners emphasize the quality of dog food more than less attached owners, this means that the fourth hypothesis is validated.

**H5: There is a Significant Difference Between More Attached and Less Attached Owners Regarding the Criteria for selecting Dog Food.**

The variable dog food selection criteria are composed of the total sum of points of all the variables of the dog food selection criteria section of the questionnaire, except for the price variable since we drew a hypothesis, in this case, hypothesis two, where we have tested its specific correlation with the level of attachment. In this variable, dog food selection criteria, more points mean, and higher overall importance given to the selection criteria of dog food.

The relationship between the importance of dog food selection criteria and the level of attachment was investigated using the Spearman product-moment correlation coefficient. We found a significant relationship between the importance of the quality of ingredients of dog food and the level of attachment,  $r_s = .221$ ,  $p < .001$  (See Annex 9). Based on these results, we conclude that there is a significant difference between more attached and less attached owners

regarding the dog food selection criteria. More attached owners give more importance to the dog food selection criteria than less attached owners, this means that the fifth hypothesis is validated.

**H6: People with Higher Degrees of Education Are More Attached to Their Dogs Than People with Lower Degrees of Education.**

The relationship between the level of education and the level of attachment of the dog-human bond was investigated using the Spearman product-moment correlation coefficient. We found a small negative and significant relationship between the owners' level of education and the level of attachment to their dogs,  $r_s = -.092$ ,  $p = .004$  (See Annex 10). Based on these results, owners with higher degrees of education are less attached to their dogs than owners with lower degrees, meaning that the sixth hypothesis is invalid.

### Chapter 5 - Discussion

Following the statistical analysis, currently, it is the moment to reflect on the study's results and to illustrate a few conclusions about the impact of the level of the attachment of the dog-human bond. Some sociodemographic characteristics, of the selection criteria of dog food, in the Portuguese population give some insights into the veterinary and dog food markets. This chapter aims to summarize the main results (confirm or not the hypothesis developed) and to comprehend which studies in the literature confirm our results and which studies do not. Additionally, the study's main limitations will be identified, including its academic and managerial implications, and suggestions for future studies.

**Table 9.**

*Hypothesis validation*

<b>Hypothesis</b>	<b>Description</b>	<b>Validation</b>
H1	Women are more attached to their dogs than men.	Validated
H2	Younger generations are more attached to their dogs than older generations.	Validated
H3	More attached owners are less price conscious than less attached owners.	Not validated
H4	More attached owners emphasize more the quality of dog food than less attached owners.	Validated
H5	There is a significant difference between more attached and less attached owners regarding dog food selection.	Validated
H6	People with a higher education degree are more attached to their dogs than people with lower degrees.	Not validated

As shown in the literature review above, dogs positively impact the well-being and health of their owners, improving their quality of life by providing social support and increasing the

level of daily physical activity. In this line of thought, the dog's role in families has been gaining importance, and consequently, the dog products market has increased exponentially in recent years. All these factors combined make the study of this topic, the dog-human bond, and its impacts on the shopping behaviours and patterns of owners, in the Portuguese population, an even more interesting and important subject.

The first hypothesis, which stated that women were more attached to dogs than men, is validated based on this dissertation's results. These results are consistent with the studies developed by Cohen (2002), Boya and colleagues (2012), Dotson and Hyatt (2008), Poresky and Daniels (2015), Prato et al. (2006), and Smolkovic et al. (2012) – as observed it is a consensual area of the literature - there were significant differences regarding the level of attachment of women and men concerning dogs. Those results go against the findings of Mallon (1993) who stated that both genders "*exhibited what could be described as a very close attachment to their dogs*". Despite that conclusion, Mallon (1993) found that women tended to be related to their dogs as if they were babies, whereas men treated them as a buddy. Moreover, the study observed that men did not dress their dogs in protective clothing, while 20% of observed female participants did.

Concerning the second hypothesis, which stated that younger owners were more attached to their dogs than older owners, the results of this study confirmed it. Several studies on the academic field are consensual regarding this topic (Dotson & Hyatt, 2008; Netting et al., 2013). Dotson and Hyatt (2008) counted the participation of 749 dog owners under 35 years old, who scored highest in the symbiotic relationship, while participants over 65 years old scored lowest on the anthropomorphic dimension. However, a study developed by Poresky and Daniels (1998) found no significant age effects on the level of attachment. Our results confirm an association between the owner's age and the level of attachment of their dog-human bond. This means that the attachment level to the dog-human bond of younger owners is greater than that of older owners. As the owners' age increases, the attachment level of the bond decreases (*See Annex 7*).

The third hypothesis, stating that more attached owners were less price conscious than less attached owners, was not validated considering our sample results. Previous studies on the relationship between dog-related purchases and the level of attachment of the relationship found that the greater the relationship was, the less price was a problem of purchase (Brockamn et al., 2008; Banton et al., 2021). In an investigation conducted by Prata (2022) in Portugal, a different result emerged - only 4.1% of participants chose price as a major factor involved in



the choice of pet food, being only the fifth out of seven available factors behind dogs' age and metabolism or list of ingredients in the pet food. The characteristics of the samples might explain these differences since more available income will understandably mean less concern regarding the expenditure of dog food. We suggest that since dogs are becoming more humanized it is natural that their foods also follow this trend. The quality of the dog food purchased has been shown as one of the major key factors in the decision to purchase (Vinassa et al., 2020; Prata, 2022).

In our fourth hypothesis, we proposed that more attached owners would give more importance to the quality of the dog food than less attached owners (Jyrinki & Leipamaa-Leskinen, 2005; Chen et al., 2012; Boya et al., 2014). Our results go in the same direction as those conclusions since we found a significant positive correlation ( $r_s = .221, p < .001$ ) between the level of attachment of the dog-human bond with the importance of the quality of the ingredients in the choice of dog food. Dog owners have several alternatives to feed their dogs. From kibble to homemade and raw foods, the options vary widely. For that reason, and to better understand what drives consumer purchases in this segment, several studies have made it the topic of their research (Jyrinki & Leipamaa-Leskinen, 2005; Chen et al., 2012; Boya et al., 2014).

Regarding the fifth hypothesis, our study found that the criteria for selecting dog food differ between more attached and less attached owners. The most important criteria for the participants were the nutrition of the food, closely followed by the quality of ingredients. The least important criteria were the existence of advertising on the food brand and the type of channel where the food is purchased.

Finally, there are different conclusions in the literature regarding the level of education and how it impacts the relationship between owners and dogs. On the one hand, several more recent studies showed that the higher the level of education, the higher the level of attachment in the dog-human bond (Dotson & Hyatt, 2008; Reid & Anderson, 2009; Calvo et al., 2016). Reid and Anderson (2009) found that participants whose highest degree of education was high school rated their attachment to their pets the lowest, while college graduates rated the highest. These studies' assumptions go against the inferences Stallones et al. (1990) and Poresky and Daniels (1998) make. Both studies found no significant effects of educational achievements on the attachment level. To incite further discussion, based on our collected data and analysis conducted, our results are that there is a slight negative correlation ( $r_s = -.092, p = .004$ ) between the level of education and the level of attachment in the dog-human bond. With this dispersion

of results, a more in-depth study of this theme is required to understand how the different levels of education impact the level of attachment to the dog-human bond.

### **5.1. Limitations**

The present study presents some limitations. First, most of our sample is not representative of the population; the high percentage of women, for example, might have biased the levels of attachment to the dog-human bond since, as previously mentioned in the literature review, several studies showed that women are more attached to dogs and demonstrate more affection and anthropomorphize more their dogs. Another limitation concerns how the study data was collected, i.e., through a non-probabilistic sample. It was mainly shared via social media and Facebook groups dedicated to dog and dog-related content – we hypothesize that people who are members of these groups are already inclined to be more committed and attached to their dogs, which can influence the overall levels of attachment of the sample.

Finally, we only evaluated the dog-human bond through the perception of the owners – in the future would be interesting to develop studies on the attachment levels of dogs regarding their owners.

### **5.2. Contributions**

#### **5.2.1. Managerial Contributions**

As a natural result of this study, some managerial contributions were made regarding dog owners and their respective purchase decisions concerning dog-related purchases, specifically dog food.

There are many factors that successful companies have in common. One of those factors is that they have a clear definition of who their consumers are. That definition is key for a company to develop the product that its consumers are looking for, to manufacture that product in the way its consumers demand it to be and commercialize it in a way that not only notices it but recognizes its benefits but also that they are attracted to. This is especially important when it comes to dog food since it is a product that impacts the dog's health and well-being, but also, it is where owners spend most of their money.

As shown in the literature review, attention and investment in dog-related themes have been rising for the past years, both in academic and business environments. The expectation is for that growth to continue for a while, while dogs assume a more important role in humans'

lives. Considering that, this study helps companies operating in this market of dog-related products understand how dog owners prioritize their purchase decisions. With this information, companies can adjust their product placement to their target audience and how they can more effectively communicate with them.

### **5.2.2. Academic Contributions**

The present study attempts to address multiple gaps and makes important academic contributions. Over the years, much academic research has been done on customer behaviour regarding many different aspects. Although attention to dog ownership and its impact on customer behaviour has increased in recent years, there is still a small amount of literature on it. This study helps to develop this topic, to fulfil this identified gap and its results confirm that the level of attachment of the dog-human bond was an excellent measure to characterize the relationship that dog owners have with their dogs and to help describe their consumer patterns. This study supports previous results regarding dog owners and their relationship with their dogs, validating some of the previous results already gathered.

### **5.3. Future Research**

In the future, it would be important to understand the relationship between dog owners' and dogs' eating habits as they reflect on the consumer's consumption and purchasing behaviours. This topic deserves attention since the phenomenon of dogs being viewed and treated as humans is spreading and becoming more popular and with this study, we could understand if owners are feeding their dogs according to their diets. There is also a possible future matter shown previously in the discussion. Different studies' conclusions regarding the level of attachment in the dog-human bond and owners' demographics point in distinct directions regarding education level. A possible study for the future could analyze more profoundly how the different levels of education have an impact on the level of attachment of the dog-human bond. Another interesting theme to be studied would be to understand the impact of the level of attachment of the dog-human bond on other dogs products besides food, such as toys and accessories. We also suggest including cats in the study of attachment and food selection criteria as they are the second most common companion animals – it would be relevant to understand if there are differences between dog owners and cat owners on their attachment levels and consumer patterns.



## **Chapter 6 - Conclusion**

This research aimed to understand how the type and strength of the relationship between a dog and its owner could affect the consumer decision-making process regarding the dog food purchase decision. The way that we studied how the dog-human bond could impact this was by asking about the owner and dog characteristics and applying a scale that allowed us to measure the relationship and compare it between all different owners. To conclude, we also analyzed the level of importance that the participants gave to each criterion involved in the decision-making process. After analyzing the results, we can affirm that each dog-human bond is unique, and that each owner has a different set of criteria that support their decision regarding their dog's diet. All hypotheses were examined and verified according to our results to get to this affirmation.

In conclusion, this research shows us that there is still much growth in the market for dog products and that the dog-human bond can serve as a means of better understanding consumers and improving communication between dog brands and dog owners. The potential for new findings related to this topic is still very high, and it will undoubtedly be a prevalent matter in the upcoming years of humanity.



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## **Annexes**

### **Annex 1**

#### Consent Form

This research study aims to understand the selection criteria for dog food, carried out by Francisco Serpa dos Santos Figueiredo and with scientific guidance from Professor Mónica Ferreira. It is a dissertation project within the scope of the master's in management at ISCTE Business School. Participants must meet the following criteria: (1) Be over 18 years old; (2) Reside in Portugal; (3) Have at least one dog; (4). Be responsible for feeding the dog.

The Enrolment in the study involves completing the following questionnaire with an estimated duration of 7 minutes. Participation in the study is VOLUNTARY. Participants may withdraw at any time and responses are ANONYMOUS and CONFIDENTIAL. Any doubt or question, do not hesitate to contact me by email: [fssfo@iscte-iul.pt](mailto:fssfo@iscte-iul.pt)

## Annex 2

### Sociodemographic Questionnaire

#### 1. Age

18-25

26-35

36-45

46-55

56-65

+65

#### 2. Gender

Female

Male

Non-Binary

Prefer not to say

#### 3. Education Level

Basic School

Secondary School

University

#### 4. Monthly Income

< 1000 euros

1000-2000 euros

2000 euros - 3000 euros

3000-4000 euros

> 4000 euros

#### 5. Household composition

1

2

3

4

+4



6. Number of Children

- 0
- 1
- 2
- 3
- 4
- +4

7. Marital Status

- Single
- Married
- Divorced
- Windowed

8. Area of Residence

- Centre
- South
- North
- Islands (Madeira and Azores)

9. How many dogs do you have?

- 1
- 2
- 3
- 4
- 5
- +5

If you have more than one dog, please think of just one dog when answering the questions in this section.

10. What is the breed of your dog?

11. Age of the Dog

- < than 1 year
- 1 and 3 years
- 4 and 8 years
- > 8 years

12. Sex of the Dog

- Male
- Female

13. Is it neutered?

- Yes
- No

14. Where did you get your pet?

- Kennel
- Dog Breeder
- Friends and Family
- Adoption
- Other \_\_\_\_\_

15. What is the weight of your dog?

- < than 10kg
- 10kg and 20kg
- 20kg and 30kg
- 30kg and 40kg
- > than 40kg

16. What is the diet of your dog?

Wet Food

Dry Kibble

Barf Diet / Raw Food

Human Food Scraps

Homemade Food

Other

17. Do you have any specific preferable brand?

Yes

No

If yes, what is the brand? \_\_\_\_\_

18. How often are your dog's food shopping made?

Every week

2 times a month

Once a Month

Every two months

Other \_\_\_\_\_

19. What is the average monthly expense you have with feeding your dog?

<10€

10€ and 20€

20€ and 30€

30€ and 40€

40€ and 50€

>50€

**Annex 3**

Lexington Attachment to Pets Scale (Portuguese Translation)

Nesta seção, por favor, avalie as seguintes afirmações, entre 0 e 3 (0=discordo totalmente; 1=discordo parcialmente; 2=concordo parcialmente; 3=concordo totalmente) dependendo da sua concordância.

	0 - Discordo totalmente	1 - Discordo parcialmente	2 - Concordo parcialmente	3 - Concordo totalmente
1. O meu cão/cadela significa mais para mim do que qualquer um dos meus amigos.				
2. Confidencio ao meu cão/cadela várias vezes.				
3. Acredito que os cães deviam ter os mesmos direitos e privilégios que membros da família.				
4. Acho que o meu cão/cadela é o meu melhor amigo.				
5. Muitas vezes os meus sentimentos em relação a pessoas são afetados pela forma com elas reagem ao meu cão/cadela.				
6. Eu amo o meu cão/cadela porque ele/ela é mais leal a mim do que a maioria das pessoas na minha vida.				
7. Eu gosto de mostrar fotografias do meu cão/cadela a outras pessoas.				
8. Eu acho que o meu cão/cadela é apenas um animal de estimação.				
9. Eu amo o meu cão/cadela porque ele/ela nunca me julga.				
10. O meu cão/cadela sabe quando eu me estou a sentir mal.				
11. Falo muitas vezes a outras pessoas sobre o meu cão/cadela.				
12. O meu cão/cadela compreende-me.				
13. Eu acho que amar o meu cão/cadela ajuda-me a manter-me saudável.				

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14. Eu acho que amar o meu cão/cadela ajuda-me a manter-me saudável.				
15. Os cães merecem tanto respeito como os humanos.				
16. O meu cão/cadela e eu temos uma relação muito próxima.				
17. Eu faria qualquer coisa para cuidar do meu cão/cadela.				
18. Eu brinco muitas vezes com o meu cão/cadela.				
19. Eu considero o meu cão/cadela um/a grande companheiro/a.				
20. O meu cão/cadela faz-me sentir feliz.				
21. Eu considero o meu cão como parte da família.				
22. Eu não sou muito ligado/ao meu cão/cadela.				
23. Ser dono de um cão/cadela traz-me felicidade.				
24. Eu considero o meu cão/cadela um amigo/a.				

**Annex 4**

Food Selection Criteria Questionnaire (Portuguese Translation)

	<b>1 - Nenhuma importância</b>	<b>2 - Pouca importância</b>	<b>3 - Nem muita nem pouca importância</b>	<b>4 - Alguma Importância</b>	<b>5 - Muita importância</b>
Preço					
Sabor					
Qualidade dos ingredientes					
Saúde/nutrição					
Facilidade de preparação					
Marca					
Estar em promoção/desconto					
Loja onde compra					
Ser orgânica/natural/holística					
Ser recomendada por um amigo/familiar					
Ser recomendada pelo veterinário					
Publicidade					

**Annex 5**

Sociodemographic Characteristics of the Participants (N=971)

		%	N
Gender	Women	81.8%	794
	Men	18.2%	177
Age	18-25	15.4%	150
	26-35	25.4%	245
	36-45	21.8%	212
	46-55	23.3%	226
	56-65	11.6%	113
	+65	2.6%	25
Level of Education	Basic School	2.2%	21
	High School	21.7%	211
	University Education	76.1%	739
Monthly Income	< 1000 euros	33.4%	324
	1000-2000 euros	45.8%	445
	2000-3000 euros	11%	107
	3000 euros – 4000 euros	5.6%	54
	>4000 euros	4.2%	41
Household of the Participant	1	16.3%	158
	2	32.2%	313
	3	23.9%	232
	4	19.7%	191
	5	6.7%	65
	+6	1.2%	12
Number of Children	0	51.1%	496

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	1	19.7%	191
	2	20.9%	203
	3	6.7%	65
	4	1.3%	13
	+4	0.3%	3
Marital Status	Single	46.1%	448
	Married	44.1%	428
	Divorced	8.7%	84
	Widowed	1.1%	11
Region of Residence	Centre	58.2%	565
	South	25.6%	249
	North	15.3%	149
	Islands (Madeira & Azores)	0.8%	8
Number of Dogs	1	62.9%	611
	2	26.3%	255
	3	6.1%	59
	4	2.3%	22
	5	0.7%	7
	+5	1.8%	17



**Annex 6**  
Dog's Characteristics

		%	N
<b>Breed of the Dog</b>	Airedale Terrier	0,1	1
	Akita inu	0,3	3
	American Bully	0,2	2
	American staffordshire terrier	0,2	2
	Barbado da Terceira	0,3	3
	Basset hound	0,1	1
	Beagle	5,7	55
	Bichon Frisé	0,1	1
	Bichon maltês	0,5	5
	Border collie	1,1	11
	Bouvier Bernois	5,1	50
	Boxer	0,7	7
	Braco alemão	0,7	7
	Braco Húngaro	0,2	2
	Bull Terrier	0,2	2
	Bulldog Francês	1,5	15
	Bulldog Inglês	0,3	3
	Bullmastif	0,1	1

Cane corso	0,4	4
Caniche	0,3	3
Cão de água português	0,5	5
Cão de fila de sao Miguel	0,1	1
Cão de Gado de Trás-os-Montes	0,1	1
Cão do Barrocal Algarvio	0,1	1
Cão lobo checoslovaco	0,1	1
Castro laboreiro	0,2	2
Cavalier King Charles Spaniel	0,5	5
Chihuahua	1,0	10
Chow chow	0,1	1
Cocker Spaniel	2,9	28
Collie	0,2	2
Corgi pembroke	0,1	1
Dálmata	0,2	2
Dobermann	0,1	1
Dogue alemão	0,4	4
Dogue argentino	0,1	1
Dogue-de-bordéus	0,5	5
Epagneul Breton	1,1	11
Fox terrier	0,4	4
Galgo	0,2	2
Golden Retriever	3,0	29

Griffon korthals	0,1	1
Husky siberiano	0,3	3
Jack Russell Terrier	2,4	23
Labrador Retriever	10,2	99
Leão da Rodésia	0,4	4
Outro	4,6	45
Parson Russell	0,1	1
Pastor Alemão	2,8	27
Pastor australiano	1,8	17
Pastor belga malinois	0,5	5
Pastor suíço	0,2	2
Pequinez	0,2	2
Perdigueiro	0,3	3
Pinscher miniatura	0,4	4
Pitbull	1,2	12
Podengo	0,3	3
Pointer alemão	0,2	2
Pointer Ingles	0,1	1
Presa canario	0,1	1
Pug	0,4	4
Rafeira alentejana	0,1	1
Ratonero Bodeguero Andaluz	0,2	2

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	Rotweiler	0,2	2
	Samoiedo	0,1	1
	Schnauzer médio	0,1	1
	Schnauzer miniatura	4,5	44
	Sem raça	28,5	277
	Serra da Estrela	0,6	6
	Serra de Aires	0,3	3
	Setter irlandês	0,1	1
	Shar Pei	0,1	1
	Shiba Inu	0,2	2
	Shih-tzu	0,6	6
	spaniel tibetano	0,2	2
	Spitz alemão	0,4	4
	Springer Spaniel	0,1	1
	Teckel	2,8	27
	Weimaraner	0,3	3
	West highland white terrier	0,6	6
	Whippet	0,2	2
	Yorkshire Terrier	2,6	25
<b>Sex of the Dog</b>	Male	54,8	532
	Female	45,2	439
<b>Age of the Dog</b>	< 1 year	8,7	84
	1 and 3 years	36	350
	4 and 8 years	35,3	343
	>8 years	20	194

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<b>Provenance</b>	Kennel	5.7	55
	Breeder	43.7	424
	Friends/Family	19.6	190
	Rescued	26.9	261
	Other	4.2	41
<b>Dogs Weight</b>	< 10 kg	24.6	239
	10kg-20kg	29.7	288
	20kg-30kg	20.9	203
	30-kg-40g	15.9	154
	<40kg	9	87
<b>Diet Composition</b>	Wet Food	2.3	22
	Dry Kibble	83.3	809
	Barg Diet /Raw Food	4.4	43
	Human Food Scraps	0.1	1
	Homemade food	2.7	26
	Other	7.2	70
<b>Preferred Dog Food Brand</b>	Yes	70.1	681
	No	29.9	290
<b>Frequency of Dog Purchase</b>	Every Week	7	68
	Bi-Weekly	16.3	158
	Monthly	55.3	537
	Every 2 months	18.3	178
	Other	3.1	30
<b>Monthly Expenditure on Dog Food</b>	< 10 euros	2.5	24
	10-20 euros	13	126
	20-30 euros	19.3	187

	30-40 euros	15.2	148
	40-50 euros	18	175
	>50 euros	32	311

### Annex 7

Medians of the Sum of All Points of the Attachment Scale in age groups

Descriptives			
	Age of the Participant		
Level of Attachment	18-25	Median	55.00
	26-35	Median	55.00
	36-45	Median	52.00
	46-55	Median	50.00
	56-65	Median	49.00
	+65	Median	48.00

### Annex 8

Spearman's Correlation Sum of All Points of the Attachment Scale and Importance of Price

Correlations				
			Percentile Group of Attachment Level	Importance of price
Spearman's rho	Percentile Group of Attachment Level	Correlation Coefficient	1.000	-.043
		Sig. (2-tailed)	.	.185
		N	971	971
	Importance of price	Correlation Coefficient	-.043	1.000
		Sig. (2-tailed)	.185	.
		N	971	971

**Annex 9**

Spearman's Correlation Sum of All Points of the Attachment Scale and Importance of Price

<b>Correlations</b>				
			Percentile Group of Attachment Level	Perception of quality of ingredients
Spearman's rho	Percentile Group of Attachment Level	Correlation Coefficient	1.000	.238**
		Sig. (2-tailed)	.	<.001
		N	971	971
	Perception of quality of ingredients	Correlation Coefficient	.238**	1.000
		Sig. (2-tailed)	<.001	.
		N	971	971
**. Correlation is significant at the 0.01 level (2-tailed).				

**Annex 10**

Spearman's Correlation on Sum of All Points of the Attachment Scale and Food Selection Criteria

<b>Correlations</b>				
			Percentile Group of Attachment Level	Food Selection Criteria
Spearman's rho	Percentile Group of Attachment Level	Correlation Coefficient	1.000	.221**
		Sig. (2-tailed)	.	<.001
		N	971	971
	Food Selection Criteria	Correlation Coefficient	.221**	1.000
		Sig. (2-tailed)	<.001	.
		N	971	971
**. Correlation is significant at the 0.01 level (2-tailed).				

**Annex 11**

Spearman’s Correlation Sum of All Points of the Attachment Scale and Level of Education

<b>Correlations</b>				
			Percentile Group of Attachment Level	Level of education
Spearman's rho	Percentile Group of Attachment Level	Correlation Coefficient	1.000	-.092**
		Sig. (2-tailed)	.	.004
		N	971	971
	Level of education	Correlation Coefficient	-.092**	1.000
		Sig. (2-tailed)	.004	.
		N	971	971
**. Correlation is significant at the 0.01 level (2-tailed).				

**Annex 12**

Medians of the Sum of All Points of the Attachment Scale in Education

<b>Descriptives</b>			
	Level of Education		
Level of Attachment	Basic School	Median	59.00
	High School	Median	54.00
	University	Median	52.00