Journal of Business and Management Studies
ISSN: 2709-0876
DOI: 10.32996/jbms
Journal Homepage: www.al-kindipublisher.com/index.php/jbms

JBMS
AL-KINDI CENTER FOR RESEARCH AND DEVELOPMENT

| RESEARCH ARTICLE

Mapping the Fur Landscape: A Dual Cluster Analysis of Relationship-Driven and Purchase-Based Segmentation of the Pet Care Market

Emmanuel Paulino, DBA, LPT[1] ✉ Djhoana M. Rington, PhD, MBA, LPT, CGSP, CHRA[2], Noemi C. Gocuyo, MGM, LPT [3], Lalaine A. Isip[4], Paulo Noel A. Mazo, DBA, LPT[5], Ronald P. Romero, Ph.D[6], Ronaldo A. Tan, Ph.D[7] and Lou-Rena S. Boquila, PD, PhD[8]

[1]Ateneo de Manila University, De La Salle University, University of the City of Manila, Jose Rizal University, and San Beda College Alabang

[2]College of Business Administration and Accountancy, De La Salle University Dasmarinas. Marketing Department. DBB-B 4115 West Ave., Dasmariñas, Cavite

[3467]Pamantasan ng Lungsod ng Maynila (PLM), General Luna corner Muralla St., Intramuros Manila, Philippines

[5]Assistant Professor III at the College of Business Administration in Pamantasan ng Lungsod ng Maynila (PLM).

[8]Assistant Professorial Lecturer II at the Pamantasan ng Lungsod ng Maynila

Corresponding Author: Emmanuel Paulino, **E-mail**: eppaulino@dlsud.edu.ph

| ABSTRACT

The growing pet care industry, especially in the Philippines, reflects shifting consumer behaviors as pet ownership rises. This study segments Filipino pet owners by their emotional bonds with pets and spending habits, aiming to reveal how these relationships influence purchasing behavior. Using a survey of 250 dog and cat owners, K-means cluster analysis identified three relationship-based clusters—Attachment-Oriented Owners, Practical Caregivers, and Activity-Focused Interactors—and three spending-based clusters—Active Pet Investors, Minimalist Pet Spenders, and Selective Pet Spenders. Findings suggest a strong link between emotional attachment and spending patterns, providing actionable insights for businesses to develop tailored marketing strategies, products, and loyalty programs to meet diverse customer needs.

| KEYWORDS

Pet ownership, Consumer behavior, Market segmentation, RFM model, Pet Care Market.

| ARTICLE INFORMATION

ACCEPTED: 14 April 2024 **PUBLISHED:** 19 May 2025 **DOI:** 10.32996/jbms.2025.7.3.10

1. Introduction

The rise in pet ownership has led to significant changes in consumer behavior, particularly in Southeast Asia, where interest in pet-related products and services has surged. In 2021, there were approximately 12.9 million pet-related Google searches, marking an 88% increase from 2019 (Grajfoner et al., 2021). This shift has been particularly pronounced in the Philippines, where pet ownership has grown due to the COVID-19 pandemic, leading to an expansion of the pet market (Quing et al., 2022). Kantar (2024) reports that 83% of Filipino households own pets, with dogs (67%) and cats (43%) being the most common, reinforcing the perception of pets as family members.

The increasing human-pet bond is closely linked to changes in consumer purchasing behavior. According to Liu et al. (2024), pet ownership significantly impacts consumer spending, leading to higher expenditures on pet-related products and services due to the emotional attachment owners develop toward their pets. This attachment is further supported by Kanat-Maymon et al. (2021), who found that both giving and receiving emotional support from pets strengthens owners' commitment to providing for their animals' needs, influencing their willingness to spend on pet essentials, accessories, and healthcare. Spending habits in

Copyright: © 2025 the Author(s). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC-BY) 4.0 license (https://creativecommons.org/licenses/by/4.0/). Published by Al-Kindi Centre for Research and Development, London, United Kingdom.

the pet care industry are also shaped by the growing role of digital and offline purchasing behavior. Liu (2023) highlights that online and offline pet product purchases are driven by different motivations, with convenience and accessibility playing a significant role in shaping pet owners' buying decisions. Meanwhile, Hobbs et al. (2023) emphasize that customer post-purchase satisfaction and reviews influence future purchasing behavior, suggesting that pet owners are highly engaged consumers who actively seek quality assurance and peer recommendations before making repeated purchases.

Beyond basic pet care, consumer interest in pet fashion and lifestyle products is also rising. Chung (2023) found that consumer consciousness around pet fashion products, such as dog clothing, reflects an evolving trend where pet owners perceive their pets as extensions of their identity. This phenomenon aligns with psychographic segmentation, where pet owners' lifestyle choices influence their pet-related spending. While these studies offer insights into pet ownership and its effects on consumer behavior, there remain key gaps that need further exploration. Prior studies have examined the emotional bond between owners and pets (Kanat-Maymon et al., 2021) and its influence on spending behavior (Liu et al., 2024), but these studies do not segment pet owners based on spending patterns—a crucial factor in predicting market trends.

Existing research has also tended to focus on psychological motivations, such as pet attachment and identity expression or purchase frequency and expenditure, without exploring how these factors intersect to define distinct consumer groups. While Chung (2023) explored fashion-conscious pet owners and Liu (2023) analyzed digital purchase behavior, neither study examined how consumer segments vary across pet-related spending categories. Moreover, much of the current literature focuses on pet food choices and veterinary expenses (Widmar et al., 2020; Hobbs et al., 2023; Liu et al., 2023), while other aspects of pet-related spending, such as grooming, accessories, and lifestyle products, remain understudied in the context of consumer segmentation.
Another critical gap in the literature is the need for a data-driven approach to market segmentation. Traditional consumer behavior research relies heavily on qualitative insights, but quantitative clustering methods such as Recency, Frequency, and Monetary (RFM) analysis have been underutilized in segmenting pet owners. The RFM model has been successfully applied in other industries (Wei et al., 2017, 2019) but remains largely absent in pet consumer studies. Addressing this gap would provide a more precise understanding of how pet owners allocate their spending and which segments contribute the most to market growth.

To address these gaps, this study aims to segment Filipino pet owners based on their psychographic attributes (attachment, interaction, and human-substitute relationship with pets) and their behavioral spending patterns (purchase frequency, spending levels, and product preferences). By applying RFM analysis to cluster pet owners into distinct consumer groups, the study seeks to provide data-driven insights into Filipino pet consumers' spending behaviors, filling the research gap on how different consumer segments prioritize various pet-related products and services. Understanding these behavioral patterns will contribute to the academic discourse on pet-related consumer behavior and offer valuable insights for businesses seeking to tailor marketing strategies for different segments of pet consumers.

2. Review of Related Literature

2.1 Human-Pet Relationship

The human-pet relationship has evolved in understanding from early attachment-focused perspectives to more recent explorations of mutual benefits and psychological effects.

Older studies, such as those by Zilcha-Mano, Mikulincer, and Shaver (2011), conceptualized human-pet relationships through an attachment theory lens, showing that pets could serve as attachment figures, providing comfort and security much like human relationships. Gray and Young (2011) further highlighted that human-pet dynamics vary cross-culturally, with pets playing diverse roles based on social and cultural contexts. Verga and Michelazzi (2009) emphasized the welfare implications of companion animals, suggesting that the quality of care provided to pets also impacts the human-pet bond. This focus on attachment and the importance of pet welfare forms the foundation of human-pet relationship studies, emphasizing emotional connections and psychological need fulfillment (Kanat-Maymon et al., 2016).

Newer research shifts towards understanding how human-pet relationships contribute to human well-being, especially in times of crisis. Hawkins and Brodie (2020) and Applebaum et al. (2020) observed that pet attachment offered emotional support during the COVID-19 lockdowns, serving as a buffer against stress and isolation. Rodriguez, Herzog, and Gee (2021) noted variability in human-animal interaction research, which has expanded beyond attachment to explore aspects like mutual support and psychological resilience. Studies such as those by Amiot and Santerre-Bélec (2022) even advocate for more balanced, reciprocal human-pet relationships, suggesting that viewing pets as equal companions can foster a healthier bond.

The pandemic context has also spurred a deeper look into specific benefits, with Morgan, Protopopova, and Birkler (2020) noting increased dog adoptions as individuals sought companionship, while Kanat-Maymon et al. (2021) demonstrated that giving and

receiving support in pet relationships enhanced well-being. More recent works, such as Amiot and Bastian (2023), examine psychological factors driving human-pet bonds, revealing that pets contribute not only comfort but also a sense of purpose and reciprocal support, especially crucial during challenging times. Together, these findings reflect a shift from viewing pets solely as attachment figures to recognizing their broader role in human mental health and social support systems.

Chen et al. (2012) identified three consumer clusters based on the human-pet relationship's impact on consumption values: anthropomorphic owners focused on quality, attached owners valuing epistemic service, and owners seeking economical, functional service. They suggest that the type of human-pet relationship shapes these consumption behaviors. Similarly, Boya et al. (2012) found three groups of dog owners—attached, moderately attached, and essential—based on relationship intensity. Tang et al. (2022) noted that pet owners with strong attachment are most likely to travel with their pets due to perceived benefits and bonding. Positive human-animal relationships can foster well-being through mechanisms like habituation and bonding (Rault et al., 2020).

The concept of attachment in human-pet relationships emphasizes the deep affection owners feel for their companion animals, often treating them as family members. This attachment drives owners to prioritize their pets' needs, leading to thoughtful purchasing decisions that ensure quality and safety, especially regarding health-related products (Park et al., 2019).

Interaction between humans and pets is another key factor shaping consumer behavior. Defined as a reciprocal relationship, the interaction involves behaviors that strengthen the bond between pet and owner, often leading owners to invest in products that facilitate this connection, such as training sessions or pet-friendly activity equipment (Wei et al., 2024). This dynamic goes beyond mere ownership; it serves as part of the owner’s socialization process, where the pet becomes an integral part of daily life and even influences the owner's regulatory orientations and lifestyle choices (Priya et al., 2018).

Human substitution on the other hand, describes how many pet owners anthropomorphize their animals, viewing them as child or friend substitutes. This perception often leads to spending behaviors similar to those of human family members, such as paying for costly medical treatments. This tendency to humanize pets encourages owners to prioritize their well-being, choosing high-quality products and remaining loyal to brands they trust, reflecting the deep, human-like relationships that have become a routine part of their lives (Chen et al., 2012; Veevers, 2016).

2.1.1 Human-Pet Relationship and Spending Habits

Studies show that strong human-pet bonds significantly influence pet owners' purchasing behavior, with many treating pets as family members and prioritizing their well-being. Due to this attachment, Brockman et al. (2008) found that owners often spend considerable amounts on high-cost veterinary care. Ridgway et al. (2008) observed that owners with indulgent buying habits often extend these behaviors to pet-related purchases, opting for premium products to improve their pets' quality of life. Similarly, Schleicher et al. (2019) noted that health and nutrition drive pet food choices, aligning with owners' dedication to their pets' welfare.

White et al. (2022) stated that the emotional bond, nature of the relationship, and role of pets in the household determine how much their owners spend on them. It was supported by Liu et al. (2024), who conclude that the time and money spent on pets depends on the bond between pets and pet owners and their role in the family. In the study of Boya et al. (2012), the greater love people have for their dogs is reflected in a number of significant market developments, including a steady rise in pet-related spending. Another study stated that pet owners' retail purchase decisions are directly influenced by their relationship with their animals. The attachment level of the pets influences the willingness of people to spend (Zhang et al., 2022).

Meng et al. (2024) and Xia et al. (2024) expand on this by examining spending on pet-friendly travel and the influence of political identity on pet product purchases, suggesting that sociopolitical values may shape pet-related consumer behaviors. During COVID-19, Rombach and Dean (2021) and Kwak and Cha (2021) found that heightened pet food spending reflected increased anxiety about pet care, reinforcing the perception of pets as family members.

Niche markets, like pet fashion, also reveal this attachment-driven spending, with Chung (2023) and Apaolaza et al. (2022) noting that pet anthropomorphism and self-expansion encourage owners to buy items like pet clothing that reflect personal style. Hobbs et al. (2023) even studied the post purchase behavior of pet-related products which may have impact on marketing strategies. These findings suggest that a strong emotional bond with pets drives diverse spending behaviors, from essentials to luxuries, underscoring the influence of attachment in the pet care market.

2.2 Hypothesis Development

Therefore, this study assumes that:
H1 : Clusters of Pet owners can be formed based on human-pet relationship variables.
H2 : Clusters of Pet owners can be formed based on the recency, frequency, and monetary amount of purchases.
H3 : There is a relationship between these formed clusters.

3. Methodology

3.1 Research Participants

The participants are male and female pet owners aged at least 18 years old and above who reside in selected cities in Metro Manila and regularly purchase pet-related products and services. Respondents are limited to those who own or adopt cats or dogs, which are common household pets and were recruited from social media groups of pet owners. To control for the effect of the number of pets, the respondents included in this study should only have not more than three pets.

The respondents are regular buyers of pet products such as pet food, treats, toys, or services such as grooming and spas.

A study conducted by Dolnicar et al. (2014), found that a sample size of 70 times the number of variables is adequate for reliable and valid segmentation studies. Therefore, 210 is the minimum number of respondents needed as this research has three variables: attachment, interaction, and human substitute. The survey was conducted from July to September 30, 2024, and yielded 250 respondents.

3.2 Instrumentation

Table 1 shows how each variable is measured through Likert items and verbal scale which is adapted from the literature mentioned in column 1.

Table 1: Variable Measurement

Variables	Questionnaire Items / Indicators	Scale
Attachment (Chen et al., 2012)	• Owning a pet has helped my health • Owning a pet adds to my happiness • My pet understands me • I am very attached to my pet • My pet and I have a close relationship.	1 – Strongly Disagree to 4 – Strongly Agreee
Interaction (Chen et al., 2012; Luh et al., 2014; Meier & Maurer, 2022)	• I play with my pet quite often • I often travel with my pet • I often take my pet along when I visit my friends or relatives. • I get comfort from touching my pet • I love to take care of my pet	
Human Substitute (Chen et al., 2012; Luh et al., 2014; Meier & Maurer, 2022)	• Quite often I confide in my pet • I love my pet because he/she is more loyal to me than most of the people in my life. • I love my pet because it never judges me. • My pet is like a friend that can keep me from being lonely • My pet give me companionship	
Recency (Pollfish, 2021)	When was the last time you bought pet related products? 1. This week 2. Within the previous 2 weeks 3. Last month	1 – lowest score 4 – highest score

	4. More than a month ago
Frequency	How frequently do you buy pet-related products? 1. Once a week 2. Twice a month 3. Once a month 4. More than a month
Monetary	How much are you spending on pet-related products? 1. Less than 5% of my monthly income 2. Around 10% of my monthly income 3. Around 15% of my monthly income 4. Around 20% or more of my monthly income

3.3 Statistical Analysis of the Data

Cluster Analysis and Nominal Tests were used to analyze the data. K-means Cluster Analysis through the Lloyd algorithm was used to identify the optimal number of clusters and to generate clusters based on human-pet relationship and purchasing behavior (Chiang & Mirkin, 2010; Brunet-Saumard et al., 2022; Steinley & Brusco, 2011; Nie et al., 2022). The chi-square test was used to identify the relationship between the two formed clusters based on the human-pet relationship and spending patterns. It compares the differences between actual and expected observed data. Furthermore, the Contingency Coefficient and Cramer's V were utilized to determine the effect sizes of this relationship (Weisburd et al., 2020; Siedlecki & Bena, 2021)

4. Results

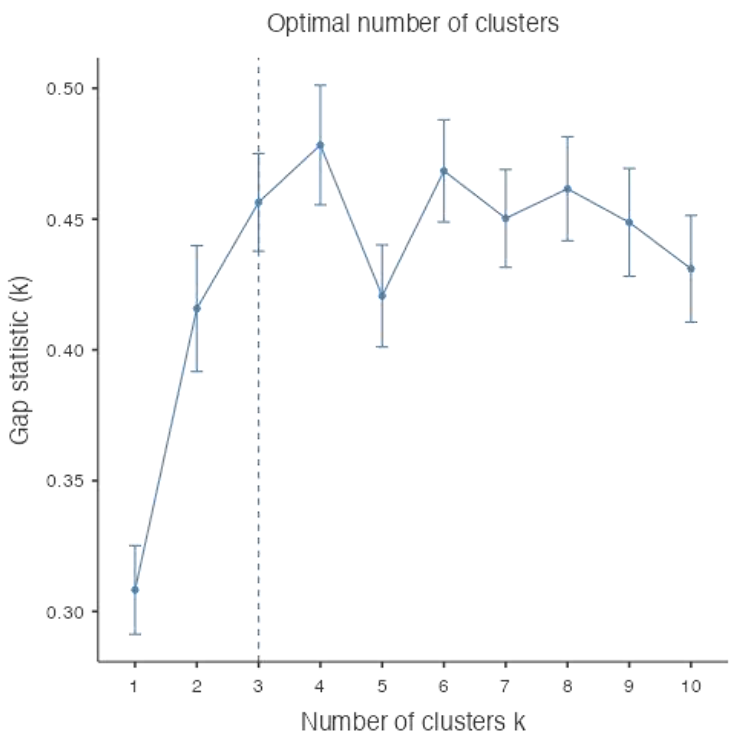

Figure 1. Optimal Number of Clusters

Figure 1 shows that the optimal number of clusters is three based on the complexities and relationships of the three input variables (Steinley & Brusco, 2011). This is the same for the cluster analysis using the human-pet relationship variables (attachment, interaction, and human substitute) and the purchase behavior variables (recency, frequency, and monetary).

Table 2. Centroids of Clusters

Cluster No	n	Attachment	Interaction	Human-Sub	Name
1	138	3.809	3.313	3.713	Attachment-Oriented Owners
2	67	2.642	2.576	3.188	Practical Caregivers
3	45	2.644	3.658	2.684	Activity-Focused Interactors

Table 2 shows the results of K-Means cluster analysis using Lloyd algoritm. Cluster 1 (n = 138) demonstrates high levels of Attachment (3.809), Interaction (3.313), and Human Substitute (3.713), reflecting a deep emotional connection with pets, regular engagement, and perceiving pets as intimate companions. This group might be referred to as Attachment-Oriented Owners (Serpell, 1996; Cohen, 2002).

Cluster 2 (n = 67) shows moderately high Attachment (2.642) and Interaction (2.576), along with a high Human Substitute score (3.188), indicating pet owners who appreciate companionship while maintaining balanced engagement. This group might be called Practical Caregivers (Albert & Bulcroft, 1988; Hirschman, 1994).

Cluster 3 (n = 45) shows moderate levels of Attachment (2.644) and Human Substitute (2.684) yet exhibits high Interaction (3.658), suggesting that individuals frequently engage with pets as activity partners instead of relying on them for emotional support. This group could be referred to as Activity-Focused Interactors (Hirschman, 1994; Dotson and Hyatt, 2008).

This can also be well understood in Figure 2.

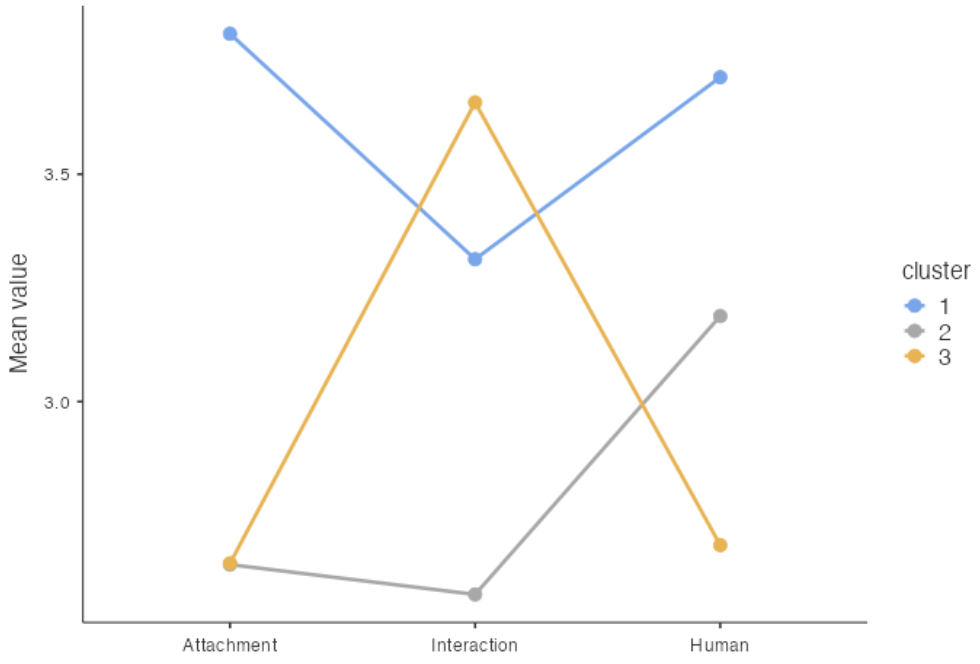

Figure 2. Plot of Means Across Clusters of Human-Pet Relationship Variables

Table 3. Multivariate Test of Human-Pet Relationship Variables based Clusters

Algorithms	value	F	df1	df2	p
Pillai's Trace	1.37	178	6	492	< .001
Wilks' Lambda	0.0971	180	6	490	< .001
Hotelling's Trace	4.49	183	6	488	< .001
Roy's Largest Root	2.73	223	3	246	< .001

The multivariate tests presented in Table 3 (Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root) demonstrate highly significant results ($p < .001$), revealing statistically significant differences in the combined dependent variables (attachment, interaction, and human substitute) among the three clusters of pet-human relationships. The values for Pillai's Trace (1.37), Wilks' Lambda (0.0971), Hotelling's Trace (4.49), and Roy's Largest Root (2.73), combined with high F-values between 178 and 223, clearly indicate a significant impact of cluster membership on these dependent variables. The low Wilks' Lambda value (0.0971) indicates a significant separation between clusters regarding attachment, interaction, and human substitute. This supports the acceptance of H1 that there are significant clusters based on Human-Pet relationship.

Table 4. Centroids of Clusters based on Purchase Behavior

Cluster No	n	Recency	Frequency	Monetary	Name
1	118	3.619	2.78	2.678	Active Pet Investors
2	65	1.723	1.231	1.6	Minimalist Pet Spenders
3	67	2.134	1.388	3.552	Selective Pet Spenders

Table 4 offers a look into the buying habits of pet owners, divided into three groups according to Recency, Frequency, and Monetary values (range 1 to 4).

Cluster 1 (n = 118) boasts the highest Recency score (3.619), showing that these pet owners frequently and recently buy pet-related products and services. Their Frequency score (2.78) indicates that they often purchase these items. The Monetary score (2.678) is moderate, suggesting a balanced approach to spending. This group comprises pet owners who make regular and recent purchases while managing their spending within a reasonable budget. These might be viewed as Active Pet Investors.

Cluster 2 (n = 65) exhibits low scores in all three variables, with Recency at 1.723, Frequency at 1.231, and Monetary at 1.6. This group comprises pet owners who buy pet-related products and services rarely, with minimal spending. The low recency score shows that these purchases are not recent, reinforcing a minimalistic or budget-friendly approach to pet care. This group can be categorized as Minimalist Pet Spenders.

Cluster 3 (n = 67) exhibits a moderate Recency score of 2.134 and a low Frequency score of 1.388, yet boasts a very high Monetary score of 3.552. This pattern indicates that pet owners in this group buy less often, but when they do, they usually spend more. Their behavior shows a tendency towards choosing higher-end or premium products or services, albeit less frequently. This group can be characterized as Selective Pet Spenders.

This can be easily understood by looking at Figure 3.

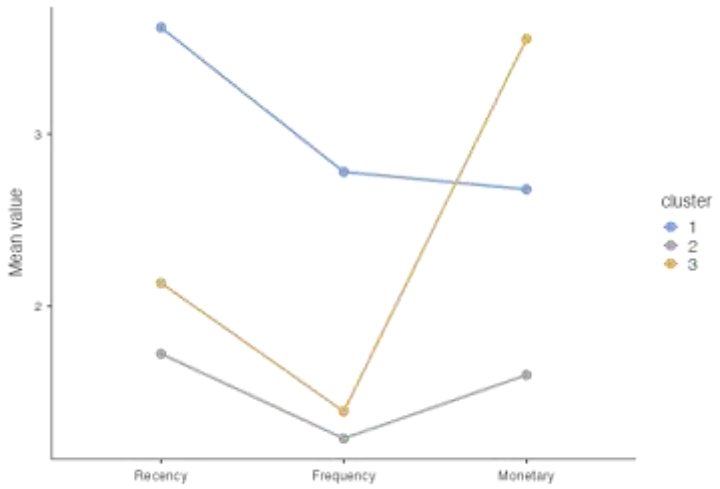

Figure 3. Plot of Means Across Clusters based on Purchase Behavior

Table 5. Multivariate Tests on Purchasing Behavior Variables according to Clusters

Algorithms	value	F	df1	df2	p
Pillai's Trace	1.27	143	6	492	< .001
Wilks' Lambda	0.123	151	6	490	< .001
Hotelling's Trace	3.91	159	6	488	< .001
Roy's Largest Root	2.74	225	3	246	< .001

Table 5 shows the results of the multivariate tests, including Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root. All show statistically significant effects ($p < .001$), indicating significant differences in the combined dependent variables—recency, frequency, and monetary values—across the clusters of pet owners. This finding suggests that each cluster represents a distinct purchasing pattern, with variations in how recently, how frequently, and how much pet owners spend on pet-related products and services.

Table 6. Contingency Tables of the Two Clusters

Clusters	Human Pet			Total
	Attachment Oriented Owners	Practical Caregivers	Activity Focused Interactors	
Purchase Behavior				
Active Pet Investors	23	26	35	84
Minimalist Pet Spenders	21	6	37	64
Selective Pet Spenders	25	16	61	102
Total	69	48	133	250

Table 6 presents the number of respondents across the clusters generated - Human Pet Cluster and Purchase Behavior Cluster. The Attachment-Oriented Owners cluster (n = 69) is relatively evenly distributed across the three types of purchasing behavior. This group shows a slight preference for Selective Pet Spenders (25) and Active Pet Investors (23), with fewer in the Minimalist Pet Spenders category (21). This suggests that pet owners with a strong emotional bond to their pets are more inclined toward investing in pet products, either selectively or actively. Attachment Oriented Owners, who treat their pets as significant companions, generally lean towards spending behaviors that support a higher level of care and quality for their pets, though a portion of this group also includes those who prefer to maintain minimal spending.

The Practical Caregivers cluster (n = 48) is primarily represented by Active Pet Investors (26), followed by Selective Pet Spenders (16), and has the fewest in the Minimalist Pet Spenders category (6). This distribution suggests that Practical Caregivers, who maintain a balanced relationship with their pets without extreme emotional attachment, are more likely to actively invest in their pets' needs through regular purchases rather than minimal or occasional spending. Practical Caregivers' purchasing behavior reflects a steady, functional approach to pet care, favoring consistent investments over a minimalist style.

The Activity Focused Interactors cluster (n = 133) is the largest group and exhibits a broader range in purchasing behaviors. The majority fall under Selective Pet Spenders (61) and Minimalist Pet Spenders (37), with a smaller portion in the Active Pet Investors category (35). This pattern indicates that Activity Focused Interactors, who prioritize interaction over emotional attachment with their pets, often favor selective or minimalist spending patterns. They may selectively purchase high-quality products or maintain minimal expenses, focusing on the practical aspects of pet ownership. Only a smaller fraction of this group engages in active, regular spending on pet-related products or services.

Table 7. Nominal Tests

Tests	Value	df	p
χ^2	14.1	4	0.007
Contingency coefficient	0.231		
Cramer's V	0.168		

Table 7 exhibits the results of the chi-square (χ^2) test, indicating a statistically significant association between the clusters of pet-owner relationships and purchasing behavior categories, with $\chi^2(4) = 14.1$, $p = 0.007$. Since the p-value is below the typical threshold of 0.05, we reject the null hypothesis, suggesting that the clusters and purchasing behaviors are not independent and that a meaningful association exists between them.

The Contingency Coefficient of 0.231 indicates a moderate association between the two categorical variables. Additionally, Cramer's V of 0.168 provides a measure of effect size for this association, also suggesting a moderate, though not strong, relationship. This moderate association implies that while there is a statistically significant relationship between pet-owner relationship clusters and purchasing behavior clusters, the strength of this relationship is modest. Therefore, while clusters of pet ownership style do influence buying patterns, other factors may also contribute to these behaviors.

5. Discussion

This study segmented Filipino pet owners into distinct clusters based on two primary dimensions: the nature of their human-pet relationships and their purchasing behaviors through Recency, Frequency, and Monetary (RFM) analysis. This dual approach identified six unique clusters, highlighting the diverse ways pet owners engage with and care for their pets, both emotionally and financially.

From the relationship clusters perspective, three clusters emerged: Attachment-Oriented Owners, Practical Caregivers, and Activity-Focused Interactors. Attachment-Oriented Owners exhibit high attachment, frequent interaction, and view their pets as family members, making them likely to invest in premium pet products to ensure their pets' well-being. Practical Caregivers, with moderate levels of attachment, adopt a more functional approach to pet care, making regular yet cost-conscious purchases. In contrast, Activity-Focused Interactors prioritize shared activities with their pets, spending selectively on items that enhance engagement rather than emotional bonding. These clusters illustrate a continuum in human-pet relationships, from deep emotional connection to activity-centered companionship, directly influencing purchasing choices. Analyzing purchasing behavior through RFM revealed another set of clusters: Active Pet Investors, Minimalist Pet Spenders, and Selective Pet Spenders.

Active Pet Investors make regular, moderately priced purchases, reflecting a commitment to consistent pet care. Minimalist Pet Spenders, on the other hand, demonstrate low spending frequency and value, focusing on essential items within a budget-friendly framework. Selective Pet Spenders adopt a premium-focused approach, purchasing pet products less frequently but with a preference for high-quality, targeted investments that enhance specific aspects of pet care. Together, these RFM clusters reflect a spectrum of spending priorities, from routine investments to strategic, high-value purchases.

The relationship-based and RFM-based clusters are interrelated, providing insights into the diverse motivations that drive consumer behavior in the pet care market. Attachment-Oriented Owners and Active Pet Investors share a commitment to regular investment in pet well-being, while Selective Pet Spenders align more with Activity-Focused Interactors, who prioritize high-quality engagement over frequency. Minimalist Pet Spenders correspond with Practical Caregivers, reflecting a balanced, budget-conscious approach to meeting essential pet care needs. This integrated clustering reveals how pet owners' spending habits are shaped not only by practical considerations but also by the emotional and functional roles pets play in their lives.

5.1 Practical Implications

Pet care businesses can enhance their product offerings by customizing them to meet the specific needs and spending habits of each segment of pet owners identified in this study. For instance, Attachment-Oriented Owners and Active Pet Investors, who have deep emotional ties to their pets and consistently prioritize their care, are likely to appreciate premium, high-quality products like organic pet food, health supplements, and advanced grooming items. Providing these kinds of products will resonate with their wish to give the best to their pets. Meanwhile, Selective Pet Spenders and Activity-Focused Interactors, who are more occasional yet high-value spenders, would benefit from the promotion of specialized items such as activity-enhancing toys, travel accessories, or adventure kits that support shared experiences and enhance interaction with their pets.

Tailored marketing campaigns can greatly enhance engagement by targeting the unique motivations of each group. Owners who see their pets as family would connect with marketing that highlights the emotional and familial elements of pet care. For practical caregivers and minimalist pet spenders, campaigns that emphasize affordability, functionality, and the value of essential pet care products would be more impactful, showcasing reliability and cost-effectiveness. Conversely, campaigns aimed at Selective Pet Spenders might highlight premium features, exclusivity, and the distinctive experiences that high-end products offer, aligning with their taste for quality and occasional indulgences.

Pet care service providers, including grooming salons, veterinary clinics, and pet hotels, can improve customer satisfaction by providing tiered service packages that align with the spending habits and needs of each group. For devoted pet owners and engaged investors, premium service bundles featuring regular check-ups, wellness monitoring, and tailored grooming sessions would probably be attractive. Budget-conscious caregivers and minimalist pet owners may find value in affordable service packages that address essential needs without any unnecessary add-ons. For discerning pet owners who value quality over quantity in their spending, exclusive service experiences such as pet retreats or wellness programs may hold particular appeal.

Customized loyalty programs that align with the purchasing habits and preferences of each segment may enhance customer retention. A loyalty system based on points for frequent buyers, like Active Pet Investors, would promote continuous engagement by offering rewards for consistent purchases. For Selective Pet Spenders, a loyalty program offering occasional discounts on premium products would enhance the attractiveness of high-value purchases. Minimalist pet spenders, who focus on value, might be motivated by loyalty rewards that highlight savings on essential items, aligning with their budget-friendly mindset.

By utilizing customer data, businesses can enhance recommendations and promotions to align with individual purchasing patterns and preferences. For example, Attachment-Oriented Owners could receive consistent reminders for health-related products, while Activity-Focused Interactors might receive tailored suggestions for seasonal or experience-driven items, like outdoor pet gear. This approach to personalization would enhance the relevance of promotional offers, leading to greater engagement and customer satisfaction within each segment.

Businesses can enhance customer loyalty by offering educational content and encouraging community engagement that resonates with the values of each segment. Focused on connections Pet owners may find value in resources focused on pet health and emotional connections, while those who are more hands-on could gain from advice on practical and budget-friendly pet care. Organizing community events or workshops for Activity-Focused Interactors can strengthen loyalty by engaging with pet owners who value active participation with their pets. By offering customized products, focused marketing strategies, and individualized service choices, pet care businesses can build stronger connections with every customer group and encourage enduring loyalty in a highly competitive landscape.

5.2 Limitations

This study has several limitations that future studies can explore. First, the sample was limited to pet owners in Metro Manila, which may affect the generalizability of findings to other regions or socio-economic contexts within the Philippines or Southeast Asia. Additionally, focusing exclusively on dog and cat owners excludes insights into owners' behaviors with other pets, such as birds, fish, or reptiles, potentially overlooking unique segments within the pet care market. The cross-sectional design also limits understanding to a single point, making it challenging to account for changes in purchasing behavior or pet-owner relationships over time; a longitudinal approach could provide more dynamic insights. Lastly, while the RFM model effectively captures purchasing behavior, it omits other influential factors, such as income level, household size, and lifestyle, which could further clarify spending patterns. Future studies addressing these limitations could offer a more comprehensive understanding of pet care consumer behavior.

Statements and Declarations

Ethics Approval and Consent to Participate: Before data gathering, the study underwent evaluation under the Ethics Review of a University in the Philippines. Necessary changes were made upon the review board's recommendation before the survey instrument was disseminated. Before answering the survey, each respondent should complete the Informed Consent form.

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflicts of Interest: The authors declare no conflicts of interest

References

[1] Albert, A., & Bulcroft, K. (1988). Pets, families, and the life course. *Journal of Marriage and Family*, 50(2), 543-552.

[2] Amiot, C. E., & Bastian, B. (2023). What is beneficial in our relationships with pets? Exploring the psychological factors involved in human–pet relations and their associations with human wellbeing. Anthrozoös, 36(4), 579-603. https://doi.org/10.1080/08927936.2023.2210437

[3] Amiot, C. E., & Santerre-Bélec, L. (2022). Toward more equal and mutual human-pet relations: Insights and possible solutions based on social psychological theories. Frontiers in Veterinary Science, 9, 1009267. https://doi.org/10.3389/fvets.2022.1009267

[4] Anzum, H. (2024). Evaluating consumer purchasing behavior for Shawpno's pet foods. http://hdl.handle.net/10361/23800

[5] Apaolaza, V., Hartmann, P., Paredes, M. R., Trujillo, A., & D'Souza, C. (2022). What motivates consumers to buy fashion pet clothing? The role of attachment, pet anthropomorphism, and self-expansion. *Journal of Business Research, 141,* 367-379. https://doi.org/10.1016/j.jbusres.2021.11.037

[6] Applebaum, J. W., Tomlinson, C. A., Matijczak, A., McDonald, S. E., & Zsembik, B. A. (2020). The concerns, difficulties, and stressors of caring for pets during COVID-19: Results from a large survey of US pet owners. Animals, 10(10), 1882. https://doi.org/10.1016/j.cpnec.2021.100071

[7] Boya, U., Dotson, M. & Hyatt, E. Dimensions of the dog–human relationship: A segmentation approach. J Target Meas Anal Mark 20, 133–143 (2012). https://doi.org/10.1057/jt.2012.8

[8] Boya, U. O., Dotson, M. J., & Hyatt, E. M. (2012). Dimensions of the dog–human relationship: A segmentation approach. *Journal of Targeting, Measurement and Analysis for Marketing*, 20, 133-143. https://doi.org/10.1057/jt.2012.8

[9] Brockman, B. K., Taylor, V. A., & Brockman, C. M. (2008). The price of unconditional love: Consumer decision making for high-dollar veterinary care. *Journal of Business Research, 61*(5), 397-405. https://doi.org/10.1016/j.jbusres.2006.09.033

[10] Brunet-Saumard, C., Genetay, E., & Saumard, A. (2022). K-bMOM: A robust Lloyd-type clustering algorithm based on bootstrap median-of-means. Computational Statistics & Data Analysis, 167, 107370. https://doi.org/10.1016/j.csda.2021.107370

[11] Chen, A., Hung, Kp. & Peng, N. (2012). A cluster analysis examination of pet owners' consumption values and behavior – segmenting owners strategically. J Target Meas Anal Mark 20, 117–132. https://doi.org/10.1057/jt.2012.10

[12] Chiang, M.MT., Mirkin, B. (2010) Intelligent Choice of the Number of Clusters in K-Means Clustering: An Experimental Study with Different Cluster Spreads. J Classif 27, 3–40. https://doi.org/10.1007/s00357-010-9049-5

[13] Chung, M. H. (2023). A Study on Consumer Consciousness and Purchasing Tendency on Pet Fashion Products (Dog Clothes). *Journal of the Korea Fashion and Costume Design Association,* 25(3), 31-39. https://doi.org/10.30751/kfcda.2023.25.3.31

[14] Cohen, S. P. (2002). Can pets function as family members? *Western Journal of Nursing Research*, 24(6), 621-638.

[15] Dolnicar, S., Grün, B., Leisch, F., & Schmidt, K. (2014). Required sample sizes for data-driven market segmentation analyses in tourism. *Journal of Travel Research, 53(*3), 296-306. https://doi.org/10.1177/0047287513496475

[16] Dotson, M. J., & Hyatt, E. M. (2008). Understanding dog-human companionship. *Journal of Business Research*, 61(5), 457-466.

[17] Esquillo, R. A., Enriquez, M. Y. L., Luciano, M. R. B., Bernardo, A. P., & Koh, A. P. (2022). The Role of Companion Animals and Its Relationship to the Well-Being, Happiness, and Loneliness of College Students Amidst the COVID-19 Pandemic. Psychology and Education: *A Multidisciplinary Journal,* 2(3), 231-243. https://doi.org/10.5281/zenodo.6626211

[18] González-Ramírez, M. T., & Landero-Hernández, R. (2021). Pet–human relationships: Dogs versus cats. Animals, 11(9), 2745. https://doi.org/10.3390/ani11092745

[19] Gray, P. B., & Young, S. M. (2011). Human–pet dynamics in cross-cultural perspective. Anthrozoös, 24(1), 17-30. https://doi.org/10.2752/175303711X12923300467285

[20] Grajfoner, D., Ke, G. N., & Wong, R. M. M. (2021). The effect of pets on human mental health and wellbeing during COVID-19 lockdown in Malaysia. Animals, 11(9), 2689. https://doi.org/10.3390/ani11092689

[21] Hawkins, R. D., & Brodie, Z. P. (2020). The role of human-pet attachment on people's mental health and wellbeing over time during COVID-19 lockdown. Paper presented at NRS Mental Health 2020 Annual Scientific Meeting : . https://www.nhsresearchscotland.org.uk/research-areas/mental-health/training-and-events/nhs-research-scotland-mental-health---asm-2020

[22] Hirschman, E. C. (1994). Consumers and their animal companions. *Journal of Consumer Research*, 20(4), 616-632.

[23] Ho, J., Hussain, S., & Sparagano, O. (2021). Did the COVID-19 pandemic spark a public interest in pet adoption?. Frontiers in Veterinary Science, 8, 647308. https://doi.org/10.3389/fvets.2021.647308
[24] Hobbs Jr, L., Shanoyan, A., Wiley, Z. Z., & Aldrich, G. (2023) Analysis of pet-food customer postpurchase experience using online customer reviews: Implications for product and marketing strategies. Agribusiness. https://doi.org/10.1002/agr.21866
[25] Kanat-Maymon, Y., Antebi, A., & Zilcha-Mano, S. (2016). Basic psychological need fulfillment in human–pet relationships and well-being. Personality and Individual Differences, 92, 69-73. https://doi.org/10.1016/j.paid.2015.12.025
[26] Kanat-Maymon, Y., Wolfson, S., Cohen, R. et al. The Benefits of Giving as well as Receiving Need Support in Human–Pet Relations. J Happiness Stud 22, 1441–1457 (2021). https://doi.org/10.1007/s10902-020-00279-9
[27] Kwak, M. K., & Cha, S. S. (2021). A study on the selection attributes affecting pet food purchase: After COVID-19 Pandemic. *International Journal of Food Properties*, 24(1), 291-303. https://doi.org/10.1080/10942912.2021.1879133
[28] Liu, Y., Chang, X., Yang, S., Li, Z., & Wu, Y. (2024). Pets make you spend more! Impact of pet ownership on consumer purchase decisions. *Journal of Business Research, 183*, 114838. https://doi.org/10.1016/j.jbusres.2024.114838
[29] Liu, Z. (2023) Unlocking Consumer Choices in the Digital Economy: Exploring Factors Influencing Online and Offline Purchases in the Emerging Pet Food Market. J Knowl Econ (2023). https://doi.org/10.1007/s13132-023-01490-8
[30] Meng, B., Chi, X., Kim, J. J., Kim, G., Quan, W., & Han, H. (2024). Traveling with pets and staying at a pet-friendly hotel: A combination effect of the BRT, TPB, and NAM on consumer behaviors*. International Journal of Hospitality Management, 120*, 103771. https://doi.org/10.1016/j.ijhm.2024.103771
[31] Morgan, L., Protopopova, A., Birkler, R.I.D. (2020) Human–dog relationships during the COVID-19 pandemic: booming dog adoption during social isolation. Humanit Soc Sci Commun 7, 155. https://doi.org/10.1057/s41599-020-00649-x
[32] Nie, F., Li, Z., Wang, R., & Li, X. (2022). An effective and efficient algorithm for K-means clustering with new formulation. IEEE Transactions on Knowledge and Data Engineering, 35(4), 3433-3443.
[33] Park, E. O., Shin, J. I., & Park, M. Y. (2019). A study on the relationship among attachment to pet, purchasing attributes of pet products, satisfaction, and behavioral intention. *Journal of the Korea Academia-industrial cooperation Society*, 20(9), 279-289.
[34] Paulino, E. (2024). Survey Data - Cluster Analysis of Pet Owners (Version 1) [Data set]. 4TU.ResearchData. https://doi.org/10.4121/FFFC883E-6ADB-4042-BC69-4E4C53DC4A24.V1
[35] Prawira, R. R., & Pangaribuan, C. H. (2023). Your pet and god: A religious case on the antecedents of pet food buying behavior. *Multidisciplinary Science Journal, 6(*6), 2024076. https://doi.org/10.31893/multiscience.2024076
[36] Priya, R. J., & Nandhini, M. (2018). Evolving opportunities and trends in the pet industry–an analytical study on pet products and services. *Journal of Applied Science and Computations, 5*(11), 1161-1173.
[37] Quing, K. A. C., Baudin, J. S. P., & Maaliw III, R. R. (2024). A Sequential Explanatory Study Examining the Buffering Effects of Human–Animal Interaction on Stress and Quality of Life among Work-from-Home Employees during the COVID-19 Pandemic in the Philippines. COVID, 4(4), 531-556. https://doi.org/10.3390/covid4040036
[38] Rault, J. L., Waiblinger, S., Boivin, X., & Hemsworth, P. (2020). The power of a positive human–animal relationship for animal welfare. Frontiers in veterinary science, 7, 590867. https://doi.org/10.3389/fvets.2020.590867
[39] Ridgway, N. M., Kukar-Kinney, M., Monroe, K. B., & Chamberlin, E. (2008). Does excessive buying for self relate to spending on pets?. *Journal of Business Research, 61*(5), 392-396. https://doi.org/10.1016/j.jbusres.2007.07.002
[40] Rodriguez, K. E., Herzog, H., & Gee, N. R. (2021). Variability in human-animal interaction research. Frontiers in Veterinary Science, 7, 619600. https://doi.org/10.3389/fvets.2020.619600
[41] Rombach, M., & Dean, D. L. (2021). Just love me, feed me, never leave me: Understanding pet food anxiety, feeding and shopping behavior of US pet owners in Covidian times. Animals, 11(11), 3101. https://doi.org/10.3390/ani11113101
[42] Schleicher, M., Cash, S. B., & Freeman, L. M. (2019). Determinants of pet food purchasing decisions. *The Canadian Veterinary Journal, 60(*6), 644.
[43] Serpell, J. A. (1996). In the Company of Animals: A Study of Human-Animal Relationships. Cambridge University Press.
[44] Siedlecki, S. L., & Bena, J. F. (2021). Exploring Associations When Your Data are Nominal: A Review of the: χ: 2: Test. Clinical Nurse Specialist, 35(5), 229-232. https://doi.org/10.1097/NUR.0000000000000617
[45] Steinley, D., & Brusco, M. J. (2011). Choosing the number of clusters in K-means clustering. Psychological Methods, 16(3), 285–297. https://doi.org/10.1037/a0023346
[46] Tang, J., Ying, T., & Ye, S. (2022). Chinese pet owners traveling with pets: Motivation-based segmentation. *Journal of Hospitality and Tourism Management,* 50, 31-43. https://doi.org/10.1016/j.jhtm.2021.12.006
[47] Veevers, J. E. (2016). The social meanings of pets: Alternative roles for companion animals. In Pets and the Family (pp. 11-30). Routledge.
[48] Verga, M., & Michelazzi, M. (2009). Companion animal welfare and possible implications on the human–pet relationship*. Italian Journal of Animal Science,* 8(sup1), 231-240. https://doi.org/10.4081/ijas.2009.s1.231
[49] Wei, J. T., Lin, S. Y., Yang, Y. Z., & Wu, H. H. (2019). The application of data mining and RFM model in market segmentation of a veterinary hospital. *Journal of Statistics and Management Systems, 22*(6), 1049-1065. https://doi.org/10.1080/09720510.2019.1565445
[50] Wei, Z., Leung, X. Y., & Xu, H. (2024). Examine pet travel experiences from human–pet interaction: the moderating role of pet attachment. Tourism Review, 79(4), 812-824. https://doi.org/10.1108/TR-01-2023-0002
[51] Wei, J.T., Lin, SY., Yang, YZ., Wu, HH. (2017). Analyzing Consumption Behaviors of Pet Owners in a Veterinary Hospital. In: Tan, Y., Takagi, H., Shi, Y. (eds) Data Mining and Big Data. DMBD 2017. Lecture Notes in Computer Science, vol 10387. Springer, Cham. https://doi.org/10.1007/978-3-319-61845-6_18
[52] Weisburd, D., Britt, C., Wilson, D.B., Wooditch, A. (2020). Measures of Association for Nominal and Ordinal Variables. In: Basic Statistics in Criminology and Criminal Justice. Springer, Cham. https://doi.org/10.1007/978-3-030-47967-1_13
[53] White, M. W., Khan, N., Deren, J. S., Sim, J. J., & Majka, E. A. (2022). Give a dog a bone: Spending money on pets promotes happiness. *The Journal of Positive Psychology,* 17(4), 589-595.

[54] Widmar, N. O., Bir, C., Slipchenko, N., Wolf, C., Hansen, C., & Ouedraogo, F. (2020). Online procurement of pet supplies and willingness to pay for veterinary telemedicine. Preventive veterinary medicine, 181, 105073. https://doi.org/10.1016/j.prevetmed.2020.105073

[55] Xia, L., Wang, J., & Gao, F. (2024). Red dog, blue dog: the influence of political identity on owner–pet relationships and owners' purchases of pet-related products and services. *European Journal of Marketing*. https://doi.org/10.1108/EJM-02-2023-0074

[56] Zhang, W., Cao, H., & Lin, L. (2022, March). Analysis of the future development trend of the pet industry. In 2022 7th International Conference on Financial Innovation and Economic Development (ICFIED 2022) (pp. 1682-1689). Atlantis Press. https://doi.org/10.2991/aebmr.k.220307.275

[57] Zilcha-Mano, S., Mikulincer, M., & Shaver, P. R. (2011). An attachment perspective on human–pet relationships: Conceptualization and assessment of pet attachment orientations. *Journal of Research in Personality*, 45(4), 345-357. https://doi.org/10.1016/j.jrp.2011.04.001