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Psychometric Adaptation and Preliminary Validation of the MDORS-CL26 and Determinants of the Human–Dog Bond Among Chilean University Students

Katalina Cabezas [1], Francisca Bertin [2], Cristian Larrondo [2], María José Ubilla [2], Cristian Ugaz [2], Gonzalo Chavez [3], Ana María Urrutia [2,*] and Hernan Cañon-Jones [2,*]

[1] Programa de Magister en Bienestar Animal y Etología Aplicada, Facultad de Medicina Veterinaria y Agronomía, Universidad de Las Américas, Santiago 7500975, Chile; katalina.cabezas@edu.udla.cl
[2] Núcleo de Investigación en Bienestar y Conducta Animal, Facultad de Medicina Veterinaria y Agronomía, Universidad de Las Américas, Santiago 7500975, Chile; fbertin@udla.cl (F.B.); clarrondo@udla.cl (C.L.); mubillac@udla.cl (M.J.U.); cugaz@udla.cl (C.U.)
[3] Escuela de Medicina Veterinaria, Facultad de Recursos Naturales y Medicina Veterinaria, Universidad Santo Tomás, Santiago 8370003, Chile; gonzalochavezcontreras@gmail.com
* Correspondence: aurrutia@udla.cl (A.M.U.); hcanon@udla.cl (H.C.-J.)

Abstract

The relationship between people and their dogs can play a meaningful role in emotional support and psychological well-being, especially during university years. However, there are few validated instruments available for assessing the human–dog bond in Latin American populations. The present study sought to adapt and evaluate the Mexican version of the Monash Dog–Owner Relationship Scale (MDORS-M) for use with Chilean university students and also explore demographic and living arrangement factors associated with the strength of this relationship. A total of 312 undergraduate students who owned at least one dog participated in the study. The psychometric evaluation was conducted in two phases. First, the original 28-item MDORS-M was examined through exploratory factor analysis. Two items belonging to the Dog–Owner Interaction dimension showed substantial overlap with other factors and were therefore removed. A second exploratory factor analysis supported a revised 26-item version, referred to as the MDORS-CL26, which retained the scale's three underlying dimensions: Dog–Owner Interaction, Emotional Closeness, and Perceived Costs. The resulting instrument showed strong reliability and internal consistency. Overall reliability indices were high (Cronbach's $\alpha = 0.87$; McDonald's $\omega = 0.89$), while reliability estimates for the individual subscales ranged from 0.77 to 0.90. Item-level analyses indicated that all remaining items contributed to their respective dimensions and should be retained. Confirmatory factor analysis provided support for the proposed three-factor structure, with all item–factor associations reaching statistical significance. Participants reported strong emotional connections with their dogs as more than nine out of ten students (92.3%) scored highly on Emotional Closeness, while nearly two-thirds (64.4%) reported moderate levels of Dog–Owner Interaction. In contrast, perceptions of the costs or burdens associated with dog ownership were comparatively low (56.1%). Female students tended to report stronger emotional bonds and more frequent interactions with their dogs than male students, although perceptions of cost of ownership were similar across groups. In addition, students whose dogs lived primarily indoors and those who shared the bedrooms, reported stronger and more positive relationship scores. The study contributes to the currently expanding body of anthrozoological research emerging from the Global South.

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1. Introduction

The relationship between humans and dogs has changed substantially over time, evolving from a largely functional association to an important social and emotional bond within many households [1,2]. This relationship has become a major topic in anthrozoological studies because of its implications for both human wellbeing and animal welfare [3]. Several theoretical perspectives have been used to explain why people form close relationships with companion animals, including the biophilia hypothesis and attachment theory [4–6]. These frameworks suggest that dogs can provide emotional support, companionship and a sense of security, particularly during stressful life events or periods of transition [3,5,6]. Various studies have also identified physiological mechanisms that may contribute to the development and maintenance of these bonds, including oxytocin-mediated interactions between dogs and their owners [7]. A growing body of evidence suggests that living with a dog may be associated with a range of physical and psychological benefits [8–11]. Companion dogs can encourage regular physical activity while also providing social companionship and emotional support [8–11]. The quality of the relationship is important not only for people but also for dogs. Positive owner–dog relationships have been associated with improved social behavior, lower stress levels and better welfare outcomes, and strained relationships may negatively affect both members of the dyad [12,13].

However, the human–dog relationship is not always positive and is influenced by multiple factors related to both the owner and the dog [14]. Characteristics such as age, gender, previous experience with animals and available caregiving time may influence how owners perceive and interact with their dogs [14,15]. On the other hand, canine characteristics, including behavior, health and activity levels, can shape owner satisfaction and attachment [16]. Thus, social exchange theory has been widely applied to understanding the human–dog bond [14]. This perspective proposes that individuals evaluate relationships according to their perceived benefits and costs, making it useful for studying companion animal ownership [14]. The need to assess these different dimensions led to the development of more comprehensive measures of the human–dog relationship such as the Lexington Attachment to Pets Scale [17,18]. However, the Monash Dog–Owner Relationship Scale (MDORS) has become one of the most widely used instruments [14]. The original scale evaluates three dimensions of the relationship: Dog–Owner Interaction, Emotional Closeness, and Perceived Costs [14], and recently Bennett et al. proposed a revised four-factor structure consisting of Perceived Costs, Affectionate Engagement, Emotional Reliance, and Dog–Owner Interaction [19]. The MDORS has been adapted and validated in several countries, including Spain and Mexico [20,21]. These studies have generally supported the usefulness of the instrument while also showing that some items may behave differently depending on the cultural context [20,21]. This geographic bias primarily reflects the historical concentration of research funding, academic infrastructure, and specialized anthrozoological centers in Northern hemisphere institutions, creating a reliance on WEIRD (Western, Educated, Industrialized, Rich, and Democratic) populations that may not fully capture the socio-cultural dynamics of human–pet relationships worldwide. This shows the importance of evaluating the scale before applying it to new populations. Evidence from South America remains limited, and psychometric studies of the human–dog relationship are still relatively scarce in the region.

University students represent an especially relevant population for this type of research. Entering higher education often involves academic pressure, financial concerns, changing social networks, and increased vulnerability to emotional distress [22]. For many students, companion animals are an important source of routine, companionship and emotional support [8,11,23]. Moreover, university student cohorts provide high accessibility and relative demographic consistency regarding age, educational attainment, and developmental stage, offering a controlled framework to evaluate the performance of psychometric scales. Full understanding of how students relate to their dogs may provide useful insights into both student wellbeing and broader human–animal bond. Most research using instruments such as the MDORS has been conducted in North America, Europe and parts of Asia [14,23,24]. In Chile, some studies exist but have traditionally focused on topics such as public health, dog population management and responsible tenure/ownership [25–27]. Thus, little attention has been given to the psychological and relational dimensions of the human–dog bond; and it remains unclear whether instruments developed and validated elsewhere adequately capture the characteristics of these relationships in Chilean populations [26].

The present study was designed to address this gap. The first objective was to evaluate the psychometric performance of the Mexican version of the MDORS in a sample of Chilean university students and, if necessary, develop a refined Chilean adaptation. The second objective was to examine demographic and cohabitation factors associated with Dog–Owner Interaction, Emotional Closeness, and Perceived Costs in these university student populations.

2. Materials and Methods

2.1. Study Design and Target Population

This study employed a quantitative, cross-sectional descriptive–correlational design. The primary objective was twofold: first, to evaluate the use of the Mexican version of MDORS within a Chilean university context, and second, to evaluate variations in the human–dog relationship in undergraduate students at Universidad de Las Américas (UDLA), Providencia Campus, Chile. The study was conducted during the second academic semester of 2025 (spring season in the Southern Hemisphere, running between August and December 2025).

2.2. Sample Selection and Inclusion Criteria

A non-probabilistic sampling strategy was used to recruit participants due to the targeted institutional nature of the investigation. The final sample comprised 312 active undergraduate university students (evenly distributed from all undergraduate programs). To ensure data validity and strict adherence to the research objectives, stringent inclusion criteria were established with participants required to be (1) actively enrolled students at the Universidad de Las Américas, (2) primary or co-guardians of at least one domestic dog (*Canis lupus familiaris*), and (3) cohabiting within the same household as the canine companion for a minimum continuous duration of six months. All participants were required to review and sign an informed consent form detailing the data anonymization protocols and the academic/non-commercial intent of the study.

2.3. Measuring Instrument

The main psychometric instrument used in this study was the MDORS-M. This version contains the 28 original items from [28] and later validated for Mexican Spanish [21]. Briefly three empirical subscales exist: (a) Dog–owner Interaction (DOI); (b) Emotional Closeness (EmClo); and (c) Perceived Costs (PerCos). All psychometric items were rated

using a standardized 5-point Likert scale, ranging from 1 ("Strongly Disagree" or "Never") to 5 ("Strongly Agree" or "Always"). To facilitate comparative statistical parity across dimensions, raw subscale totals were normalized to a uniform 0% to 100% score. Although the Mexican version contains 28 items, the final Chilean adaptation was determined empirically during the psychometric validation process described below. Importantly, a revised version of the MDORS proposing a four-factor structure (Perceived Costs, Affectionate Engagement, Emotional Reliance, and Dog–Owner Interaction) has recently been introduced by [19], but the present study was intentionally based on the traditional three-factor framework underlying the original MDORS and its Mexican adaptation. This decision was made to ensure conceptual and methodological comparability with the only validated Spanish-language version currently available for Latin America (MDORS-M). Also, the revised four-factor model has only recently been proposed and has not yet accumulated sufficient evidence across diverse cultural settings, the present study sought first to determine whether the established three-factor structure could be adequately reproduced within a Chilean university population before testing alternative conceptualizations of the human–dog relationship.

2.4. Socio-Demographic and Contextual Variables

A structured socio-demographic questionnaire was added to capture relevant independent predictors such as:

(a) Owner variables: gender identity and age.
(b) Dog variables: sex, reproductive status (neutered/spayed vs. intact) and registration status within the Chilean National Registry of Pets [29].
(c) Cohabitation dynamics: Mode of dog acquisition (adoption, rescue from street, gift, purchase or litter retention), primary residence profile of the canine (indoors, outdoors in yard/terrace or alternating) and whether the dog was permitted to sleep in the owner's bedroom.

2.5. Data Collection Procedures

Data were collected over a multi-month academic period using a hybrid recruitment strategy. The study dissemination combined peer-to-peer recruitment and institution-wide university communications to maximize visibility among potential participants. The survey instrument was administered through a self-completion format using an encrypted institutional digital platform (Microsoft Forms), which participants could access through QR codes. Completion of the survey required 12 to 15 min.

2.6. Ethical Considerations

The study was approved by the Scientific Ethics Committee of Universidad de Las Américas (Protocol No. CEC_FP_2025047). All respondents provided informed consent and received detailed information regarding the strict confidentiality of their responses, the anonymization of personal identifying information, the voluntary nature of participation and their right to discontinue the survey at any stage without academic consequences. No monetary compensation or institutional incentives were offered in exchange for participation.

2.7. Psychometric Validation and Statistical Analyses

All statistical analyses were performed using Jamovi version 2.7. Descriptive statistics were calculated for all demographic and dog-related variables. Continuous variables were summarized using means and standard deviations, while categorical variables were reported as frequencies and percentages. Statistical significance was established a priori

at $p < 0.05$. The psychometric assessment of the Chilean adaptation of the MDORS-M followed a sequential, multi-stage validation framework. First, the complete 28-item Mexican version of the MDORS-M was examined to assess its factorial performance in a Chilean university sample. Prior to factor extraction, the adequacy of the correlation matrix was evaluated using the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity. Results indicated that the 28-item version met the required assumptions for exploratory factor analysis. An Exploratory Factor Analysis (EFA) was subsequently conducted using Principal Component Analysis (PCA) with orthogonal Varimax rotation. Factor retention was based on eigenvalues greater than one, examination of the scree plot, percentage of explained variance, and consistency with the theoretical three-factor structure proposed in both the original MDORS and its Mexican adaptation. Factor loadings, cross-loadings, and uniqueness values were inspected to determine the factorial adequacy of each item. The initial 28-item solution revealed that two items belonging to the Dog–Owner Interaction dimension displayed notable factorial ambiguity, evidenced by meaningful cross-loadings on more than one component. Consistent with widely accepted psychometric recommendations, items showing insufficient factorial discrimination were identified as candidates for elimination. Consequently, these two interaction items were removed, and a second exploratory analysis was performed using the remaining 26 items. The revised 26-item version was re-evaluated through a second PCA with Varimax rotation. The adequacy of this refined solution was once again examined using KMO and Bartlett statistics, together with component interpretability, explained variance, and theoretical correspondence with the original MDORS dimensions. The final structure retained three clearly interpretable factors representing Dog–Owner Interaction, Emotional Closeness, and Perceived Costs. This second-stage analysis served as the basis for the final Chilean adaptation, designated MDORS-CL26.

To examine factorial validity and overall structural fit, a Confirmatory Factor Analysis (CFA) was conducted using maximum likelihood estimation. Model fit was evaluated through conventional goodness-of-fit indicators, including the Chi-square to degrees of freedom ratio (X^2/df), the Comparative Fit Index (CFI), the Tucker–Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA) with its 90% confidence interval, and the Standardized Root Mean Square Residual (SRMR). Model fit was considered acceptable according to established psychometric criteria: $X^2/df < 3.0$, CFI and TLI ≥ 0.90, RMSEA ≤ 0.08 (with an upper 90% confidence interval limit < 0.10), and SRMR ≤ 0.08. Standardized factor loadings were also examined to verify that all items showed adequate associations with their respective latent constructs ($\lambda \geq 0.40$).

2.8. Reliability Analyses

Internal consistency was assessed only after establishing the final factorial structure. Reliability analyses were conducted for each subscale as well as for the overall instrument using Cronbach's alpha coefficients. In addition, corrected item-total correlations and alpha-if-item-deleted statistics were examined to evaluate item discrimination and each item's contribution to overall scale reliability. Corrected item-total correlations exceeding 0.30 and Cronbach's alpha coefficients $\geq$0.70 were considered indicative of satisfactory psychometric performance. Following confirmation of the psychometric properties of the final 26-item version, subscale scores were calculated as the arithmetic mean of the items composing each dimension. These scores were then transformed into standardized percentages ranging from 0 to 100 to facilitate comparisons across dimensions. The resulting scores were subsequently used in all inferential analyses. Differences between binary groups (e.g., bed-sharing practices, registration status, and cohabitation-related factors) were analyzed using independent samples *t*-tests. Comparisons involving variables with more than two

categories (e.g., gender identity, acquisition method, and primary living location) were evaluated through one-way analyses of variance (ANOVA). Whenever significant omnibus effects were detected, Tukey's Honest Significant Difference (HSD) post hoc tests were performed to identify pairwise group differences.

3. Results

3.1. Sample Characteristics

The sample consisted of 312 university students who met the inclusion criteria (Table 1). Female students represented most participants (84.6%), whereas males and non-binary participants represented 12.5% and 2.9%, respectively. The mean age of the sample was 22.5 ± 4.8 years. Most dogs were acquired through adoption (38.8%) or direct rescue (21.5%), and approximately two-thirds of dogs were sterilized (60.9%). Most animals lived primarily indoors (60.6%), and 67.3% were allowed to sleep in their guardian's bedroom. Registration and microchipping rates were also high (65.1% and 74.4%, respectively).

Table 1. Sociodemographic characteristics of students and dogs.

Variable	Category	*n*	%
Gender identity	Female	264	84.6
	Male	39	12.5
	Non-binary/Other	9	2.9
Dog	Adoption from rescue center	121	38.8
	Rescued from street	67	21.5
	Gift	63	20.2
	Purchased from breeder	40	12.8
	Kept from household litter	15	4.8
Dog sex	Female	171	54.8
	Male	141	45.2
Reproductive status	Neutered/Spayed	190	60.9
	Intact	122	39.1
Primary living location	Indoors (house/apartment)	189	60.6
	Alternating (indoor/outdoor)	74	23.7
	Outdoors (yard/terrace)	49	15.7
Sleeping area	Dog sleeps in owner's room/bed	210	67.3
	Restricted from owner's room	102	32.7
Microchip status	Microchipped	225	74.4
	Not microchipped	77	25.6
National Registry status	Registered	197	65.1
	Not registered	105	34.9

3.2. Preliminary Psychometric Evaluation of the 28-Item MDORS-M

The psychometric evaluation began with the complete 28-item Mexican version of the MDORS-M. Examination of the correlation matrix supported factor extraction, with excellent sampling adequacy (KMO = 0.901) and Bartlett's Test of Sphericity (X^2 = 4730, df = 378, $p < 0.001$). Exploratory Principal Component Analysis (PCA) with Varimax rotation extracted three components, accounting for 53.3% of the total variance. The

first, second and third components explained 24.4%, 18.1%, and 10.7% of the variance, respectively. Inspection of the rotated component matrix revealed that most items loaded on their theoretically expected dimensions. However, two items belonging to the Dog–Owner Interaction dimension (DOI1 and DOI8) demonstrated substantial cross-loadings across multiple components, indicating insufficient factorial discrimination (Table 2). In contrast, all Emotional Closeness and Perceived Costs items exhibited a stable factorial structure consistent with previous international validations. Based on these findings, the two problematic items were removed, and the factorial structure was re-evaluated using the remaining 26 items.

Table 2. Rotated component matrix of the initial 28-item MDORS-M.

Item	Component			Uniqueness	Decision
	1	2	3		
DOI1	0.455		0.448	0.589	Removed
DOI2			0.691	0.468	Retained
DOI3			0.546	0.615	Retained
DOI4	0.553			0.620	Retained
DOI5			0.750	0.403	Retained
DOI6	0.609			0.550	Retained
DOI7	0.321		0.674	0.434	Retained
DOI8	0.599		0.305	0.546	Removed
DOI9			0.557	0.614	Retained
EmClo1	0.801			0.321	Retained
EmClo2	0.804			0.324	Retained
EmClo3	0.737			0.431	Retained
EmClo4	0.813			0.325	Retained
EmClo5	0.796			0.356	Retained
EmClo6	0.722			0.446	Retained
EmClo7	0.740			0.438	Retained
EmClo8	0.613			0.570	Retained
EmClo9	0.642			0.542	Retained
EmClo10	0.540			0.703	Retained
PerCos1		0.767		0.408	Retained
PerCos2		0.831		0.291	Retained
PerCos3		0.837		0.234	Retained
PerCos4		0.816		0.328	Retained
PerCos5		0.807		0.297	Retained
PerCos6		0.574		0.660	Retained
PerCos7		0.528		0.708	Retained
PerCos8		0.694		0.478	Retained
PerCos9		0.727		0.390	Retained

3.3. Development of the Chilean 26-Item Version (MDORS-CL26)

After removing the two interaction items that showed unstable factorial performance, the analysis was repeated using the remaining 26 items. The adequacy of the data for factor analysis remained excellent, as reflected by a KMO value of 0.900, while Bartlett's Test of Sphericity continued to indicate strong inter-item correlations (X^2 = 4375, df = 325, $p < 0.001$). These results supported the continuation of the factorial analyses with the reduced version of the instrument. The new solution reproduced the three-dimensional framework originally proposed for the MDORS (Figure 1, Table 3), comprising the factors Dog–Owner Interaction, Emotional Closeness, and Perceived Costs. In comparison with the initial 28-item model, the revised structure displayed a more coherent pattern of item–factor relationships, with fewer instances of overlapping loadings and greater distinction between

constructs. All retained items met established criteria for acceptable factor loadings. Within the Emotional Closeness domain, EmClo2, EmClo4, and EmClo5 emerged as the most strongly represented indicators. Likewise, PerCos2, PerCos3, PerCos4, and PerCos5 showed the highest loadings for the Perceived Costs factor. Among the Dog–Owner Interaction items, DOI5 and DOI7 were the strongest contributors to the underlying construct.

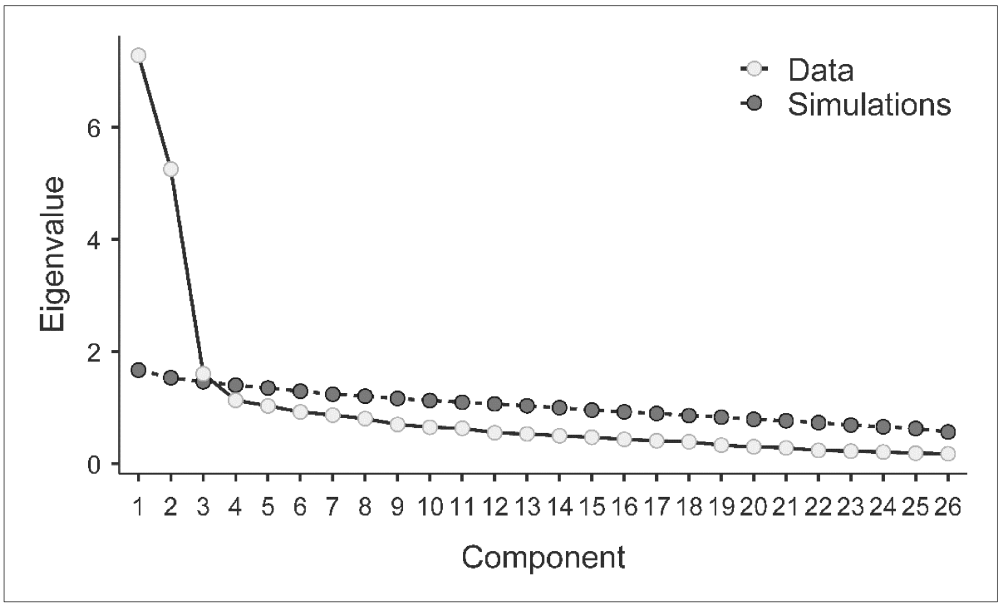


Figure 1. Scree plot of the final 26-item solution.

Table 3. Rotated Component Matrix of the final MDORS-CL26.

Item	Component			Uniqueness
	1	2	3	
DOI2			0.686	0.477
DOI3			0.567	0.588
DOI4	0.555			0.619
DOI5			0.760	0.388
DOI6	0.614			0.553
DOI7	0.323		0.679	0.427
DOI9			0.560	0.609
EmClo1	0.798			0.325
EmClo2	0.806			0.316
EmClo3	0.741			0.418
EmClo4	0.811			0.327
EmClo5	0.800			0.347
EmClo6	0.723			0.443
EmClo7	0.747			0.426
EmClo8	0.613			0.573
EmClo9	0.648			0.538
EmClo10	0.534			0.709
PerCos1		0.767		0.410
PerCos2		0.831		0.290
PerCos3		0.837		0.232
PerCos4		0.814		0.329
PerCos5		0.806		0.297
PerCos6		0.576		0.660
PerCos7		0.527		0.707
PerCos8		0.695		0.473
PerCos9		0.726		0.390

3.4. Reliability Analysis of the MDORS-CL26

The reliability results supported the internal consistency of the MDORS-CL26 across all assessed dimensions (Table 4). The Dog–Owner Interaction subscale demonstrated acceptable reliability (Cronbach's α = 0.79), whereas the Emotional Closeness and Perceived Costs subscales both exhibited strong levels of internal consistency. At the scale level, the complete 26-item instrument achieved a Cronbach's α of 0.871, further supporting the reliability of the Chilean version of the MDORS.

Table 4. Internal consistency statistics for the MDORS-CL26 (Cronbach's α, McDonald's ω).

Scale	Items	Cronbach's α	McDonald's ω
Dog–Owner Interaction	7	0.773	0.781
Emotional Closeness	10	0.899	0.912
Perceived Costs	9	0.896	0.900
Total MDORS-CL26	26	0.871	0.889

The pattern of corrected item-total correlations provided additional evidence for the adequacy of the final item set (Table 5). Every item surpassed the recommended cutoff of 0.30, supporting its contribution to the measurement of the intended construct. Correlation coefficients ranged from 0.52 to 0.68 for Dog–Owner Interaction, from 0.45 to 0.78 for Emotional Closeness, and from 0.51 to 0.84 for Perceived Costs. Although EmClo10 presented the lowest coefficient (r = 0.45), its performance remained within acceptable intervals and its retention was justified on theoretical grounds. In all, these results suggest that removing the two problematic items enhanced the clarity of the factorial structure while maintaining satisfactory levels of reliability throughout the instrument.

Table 5. Corrected Item-Total Correlations (CITCs) and Cronbach's α of the final MDORS-CL26.

Item	CIT Correlations	Cronbach's α if Deleted
DOI2	0.578	0.866
DOI3	0.590	0.866
DOI4	0.518	0.871
DOI5	0.646	0.865
DOI6	0.558	0.866
DOI7	0.683	0.864
DOI9	0.561	0.866
EmClo1	0.783	0.867
EmClo2	0.779	0.867
EmClo3	0.714	0.868
EmClo4	0.779	0.867
EmClo5	0.775	0.868
EmClo6	0.733	0.866
EmClo7	0.752	0.867
EmClo8	0.640	0.867
EmClo9	0.678	0.865
EmClo10	0.453	0.871

Table 5. *Cont.*

Item	CIT Correlations	Cronbach's α if Deleted
PerCos1	0.713	0.867
PerCos2	0.805	0.863
PerCos3	0.838	0.863
PerCos4	0.780	0.866
PerCos5	0.794	0.860
PerCos6	0.558	0.868
PerCos7	0.511	0.868
PerCos8	0.615	0.870
PerCos9	0.731	0.865

The intercorrelations among the MDORS-CL26 dimensions are shown in Table 6. Dog–Owner Interaction associated with Emotional Closeness (r = 0.609), indicating that higher levels of interaction with dogs were accompanied by stronger perceived emotional attachment. A weaker relationship was identified between Dog–Owner Interaction and Perceived Costs (r = 0.213). In contrast, Emotional Closeness and Perceived Costs were essentially unrelated (r = 0.016), suggesting that emotional bonding and perceptions of the practical burdens of dog ownership represent largely independent dimensions among Chilean university students.

Table 6. Descriptive statistics (mean and standard deviation) and Pearson correlations among the three dimensions of the Chilean adaptation of the Monash Dog Owner Relationship Scale (MDORS-CL26).

Dimension	Mean	SD	Pearson r		
			1	2	3
1. Dog–Owner Interaction	3.42	0.82	—		
2. Emotional Cl	4.58	0.52	0.609	—	
3. Perceived	2.58	0.96	0.213	0.016	—

Note: Values on the diagonal are omitted. Higher scores indicate greater dog–owner interaction, emotional closeness and perceived costs within the human–dog relationship.

Confirmatory factor analysis provided partial support for the proposed three-factor structure of the MDORS-CL26 (Table 7). All standardized factor loadings were statistically significant ($p < 0.001$), indicating that each retained item contributed meaningfully to its respective latent construct. Model fit indices suggested acceptable residual fit (SRMR = 0.0758) and an overall model fit (CFI = 0.854, TLI = 0.840, RMSEA = 0.0815, 90% CI = 0.0755–0.0875). Although global fit indices did not reach the most stringent recommended thresholds, the overall pattern of results, together with the exploratory factor analysis and reliability evidence, supported the retention of the three-factor structure comprising Dog–Owner Interaction, Emotional Closeness and Perceived Costs in the Chilean adaptation of the instrument (Figure 2).

Table 7. Goodness-of-fit statistics for the confirmatory factor analysis of the final 26-item Chilean adaptation of the MDORS (MDORS-CL26).

Fit Measures		Value
X^2		909 (df = 296, $p < 0.001$)
CFI		0.854
TLI		0.840
SRMR		0.0758
RMSEA		0.0815
RMSEA 90% CI	Lower	0.0755
	Upper	0.0875

Note: CFI = Comparative Fit Index; TLI = Tucker–Lewis Index; SRMR = Standardized Root Mean Square Residual; RMSEA = Root Mean Square Error of Approximation; CI = confidence interval. Lower values of SRMR and RMSEA and higher values of CFI and TLI indicate better model fit.

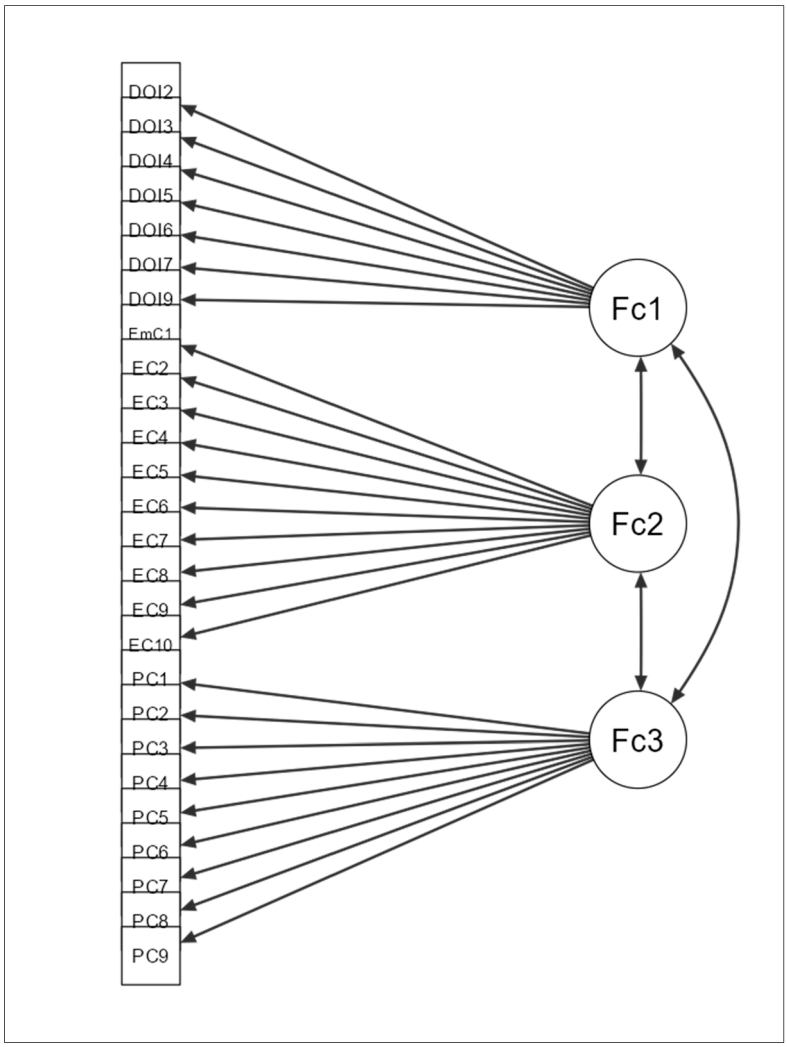


Figure 2. Confirmatory factor analysis of the MDORS-CL26. Standardized factors are displayed for the three latent dimensions (Dog–Owner Interaction, Emotional Closeness, and Perceived Costs). All item loadings were statistically significant ($p < 0.001$).

3.5. Descriptive Scores of the MDORS-CL26

At the population level, students reported high levels of Emotional Closeness and positive Dog–Owner Interaction with their dogs. Mean standardized scores (Table 8) were

highest for Emotional Closeness and lower for Dog–Owner Interaction and Perceived Costs, indicating positive student–dog relationships characterized by strong emotional attachment and low perceptions of burden.

Table 8. Descriptive statistics of MDORS-CL26 dimensions.

Dimension	Number of Items	Mean Score (0–5)	Standardized Score (%)
Dog–Owner Interaction	7	3.22	64.4
Emotional Closeness	10	4.62	92.3
Perceived Costs	9	2.81	56.1
Total MDORS-CL26	26	-	-

3.6. Determinants Associated with the Human–Dog Relationship

Gender significantly influenced the quality of the student–dog relationship. Higher levels of Dog–Owner Interaction and Emotional Closeness were observed among female students compared with male students, whereas Perceived Costs remained comparable across gender groups. Although no differences emerged within the non-binary subgroup, the limited sample size requires cautious interpretation of these results. Household context also influenced the quality of the human–dog relationship (Table 9). Students whose dogs spent most of their time indoors reported greater interaction and stronger emotional attachment than those whose dogs were primarily housed outdoors. Also, sharing a bedroom with a dog was associated with higher scores for both interaction and emotional closeness. No effects were observed for Perceived Costs, which remained consistent regardless of housing or sleeping arrangements. These results may indicate that physical proximity and daily cohabitation are relevant to the emotional and interactive aspects of the human–dog bond, while perceptions of the demands associated with ownership may be less sensitive to contextual factors.

Table 9. MDORS-CL26 scores according to living location and sleeping arrangement.

Variable	*n*	Dog–Owner Interaction (%)	Emotional Closeness (%)	Perceived Costs (%)
Primary living location				
Indoors (house/apartment)	189	67.4 ± 17.2	93.5 ± 10.3	55.1 ± 17.5
Alternating (indoor/outdoor)	74	63.0 ± 15.9	92.5 ± 10.1	59.4 ± 15.9
Outdoors (yard/terrace)	49	54.7 ± 17.1	87.3 ± 11.4	55.3 ± 18.1
ANOVA *p*-value		<0.001	0.004	>0.05
Sleeping arrangement				
Dog sleeps in owner's room/bed	210	69.2 ± 15.7	95.1 ± 8.2	56.3 ± 17.1
Dog restricted from owner's room	102	54.4 ± 16.4	86.5 ± 12.5	55.9 ± 17.5
t-test *p*-value		<0.001	<0.001	

As shown in Table 10, the psychometric properties of the Chilean adaptation were broadly comparable to those reported for previous international versions of the MDORS. The Chilean version retained fewer items than the original Australian and Mexican versions, and internal consistency remained within acceptable ranges and preserved the theoretical three-factor structure of the instrument. The reliability of the Dog–Owner Interaction dimension was higher than that reported in the original Australian version and approached the values observed in the Mexican adaptation.

Table 10. Comparison of the psychometric properties reported for the original Australian MDORS, the Mexican adaptation (MDORS-M), and the present Chilean adaptation (MDORS-CL26).

Study	Country	Number of Items	Dog–Owner Interaction (α)	Emotional Closeness (α)	Perceived Costs (α)	Total Scale (α)
[14]	Australia	28	0.67	0.84	0.84	Not reported
[21]	Mexico	28	0.82	0.91	0.81	0.88
Present study (MDORS-CL26)	Chile	26	0.773	0.899	0.896	0.871

4. Discussion

The psychometric performance of the MDORS-CL26 was broadly comparable to that reported in previous international validations. Reliability coefficients for Emotional Closeness and Perceived Costs were highly similar to those observed in both the original Australian version and the Mexican adaptation [14,20,21]. Furthermore, the Dog–Owner Interaction dimension demonstrated stronger internal consistency than that reported in the original Australian validation and approached the values reported for the Mexican adaptation [14,21]. These findings suggest that the removal of factorially ambiguous items improved measurement precision while preserving the conceptual integrity of the instrument. The same conclusions have been reported in recent evaluations of the MDORS framework, where targeted refinements improved psychometric performance without substantially altering the underlying constructs of the human–dog relationship [19].

An important contribution of the present study lies in the relationships observed among the three dimensions of the MDORS-CL26. The Dog–Owner Interaction dimension showed a moderate positive association with Emotional Closeness dimension, indicating that students who interacted more frequently with their dogs also reported stronger emotional attachment. This finding is consistent with attachment-based interpretations of the human–animal bond, where repeated interaction strengthens perceptions of companionship, social support and emotional security [3,5,6]. In contrast, Emotional Closeness was unrelated to Perceived Costs in the present study. This pattern differs from findings reported in previous MDORS studies, where emotional attachment was associated with lower perceptions of ownership burden [14,21]. One possible explanation is that many Chilean university students continue to reside within family households where caregiving and economic responsibilities are distributed among several household members. Consequently, students may derive substantial emotional benefits from their relationship with their dogs without directly experiencing the economic demands associated with ownership. This pattern was observed not only in the correlation analyses but also in the confirmatory factor model, where Emotional Closeness and Perceived Costs behaved as largely independent constructs, and reflects the fact that dog ownership goes beyond costs [2,30].

The confirmatory factor analysis yielded statically significant factor loading for the proposed three-factor structure. Although goodness-of-fit indices did not achieve the most conservative thresholds commonly recommended for structural equation modelling, all retained indicators loaded significantly on their expected latent dimensions. In fact, the factorial configuration was highly consistent with the exploratory analyses and preserved the structure originally proposed for the MDORS [14]. Similar situations have been reported in psychometric studies involving multidimensional measures of human–animal relationships where exploratory evidence and reliability estimate frequently provide stronger support than global fit indices obtained through confirmatory models [19,21]. In consequence, the evidence derived from exploratory factor analysis, corrected item-total correlations, reliability analyses and confirmatory testing supports the use of the MDORS-CL26 as a

psychometrically adequate instrument. Future studies should continue evaluating measurement invariance across sex, age groups and non-student populations while also examining alternative factorial structures that may improve overall model fit [19].

A major strength and contribution of this study lie in its position as one of the few psychometric and anthrozoological investigations conducted in the Global South. Historically, research on the human–animal bond has been dominated by populations from North America, Western Europe and parts of Asia, creating uncertainty regarding the applicability of existing theoretical frameworks in Latin American contexts [14,23,24]. The present study demonstrates that standardized multidimensional instruments such as MDORS retain substantial utility when applied within culturally distinct populations. Furthermore, the results of the Chilean context in this study introduces relational dynamics that are less frequently represented in the international literature, including high rates of dog adoption and rescue, strong family involvement in pet care and the growing influence of responsible ownership legislation [26,29].

The descriptive results reinforce the growing body of evidence that indicates companion animals function as important sources of emotional support and psychological wellbeing [11,22,31]. Participants reported particularly high levels of Emotional Closeness, suggesting that dogs frequently serve as attachment figures and sources of emotional regulation during periods characterized by academic stress, uncertainty and developmental transition, similar to previous studies [5,6,32]. Our results support the notion that companion dogs function as important psychological resources for young adults navigating the challenges associated with higher education [32,33].

Our results align with previous international studies showing that female students reported significantly higher levels of Dog–Owner Interaction and Emotional Closeness than male students [14]. Similar gender-related patterns have been observed in Spain and other cultural contexts and are generally attributed to socialization processes that promote caregiving behaviors, empathy and emotional expressiveness among women [20]. In the Latin American context, these differences may be further amplified by traditional gender norms that continue to influence caregiving roles and emotional expression, such as "machismo". However, these differences did not extend to the Perceived Costs dimension, suggesting that practical and financial responsibilities associated with responsible dog ownership are recognized similarly across genders despite differences in emotional attachment. Such results provide additional support for the conceptual distinction between positive relationship dimensions and ownership burdens within the MDORS framework [14,34].

The present study also pointed out the influence of domestic living arrangements on the quality of the human–canine bond. Students whose dogs lived primarily indoors and those who shared bedrooms with their dogs reported significantly higher levels of Dog–Owner Interaction and Emotional Closeness. These findings are consistent with attachment-based perspectives proposing that physical proximity facilitates opportunities for social interaction, tactile contact, mutual gaze and emotional co-regulation [6,13,33]. These processes are believed to reinforce affiliative bonds through behavioral and neuroendocrine mechanisms involving oxytocin-mediated feedback loops [7].

Several limitations of our study should be acknowledged. First, the cross-sectional design precludes causal inferences regarding the associations observed between student characteristics and MDORS dimensions. Second, the use of a convenience sample drawn from a single university limits the generalizability of the findings to broader Chilean populations. Third, the predominance of female respondents may have influenced some relationship patterns observed in the study. Fourth, the factorial structure should be considered preliminary and require replication in an independent sample due to the exploratory and the confirmatory analyses conducted using the same sample. Fifthly, we did not

recorded size, breed or type of dog owned, which may influence the perception of owners. Finally, it is important to consider that many Chilean university students continue to live with their families during their university years [35]. As a result, responsibilities associated with dog ownership may be shared among household members rather than assumed exclusively by the respondent, which could contribute to lower perceptions of ownership-related costs. Future research would benefit from multicenter sampling approaches, the inclusion of more demographically diverse populations, and further examination of the psychometric performance of the MDORS-CL26 beyond university settings. Incorporating complementary measures, such as the Canine Behavioral Assessment and Research Questionnaire (C-BARQ), could also facilitate a more comprehensive and bidirectional assessment of the human–dog relationship [12].

5. Conclusions

The MDORS-CL26 showed satisfactory psychometric performance, supporting its use among Chilean university students. The refined 26-item version preserved the theoretical structure of the original instrument while improving factorial clarity and reliability. Findings also highlight the central role of companion dogs in young adults' lives, with emotional bonds strengthened through daily cohabitation. Notably, emotional attachment appeared independent of perceived ownership costs, reflecting the particular social and family context of this population As one of the few psychometric studies of the human–animal bond conducted in South America, this research contributes to addressing the geographic imbalance that characterizes much of the anthrozoological literature. The MDORS-CL26 offers a valuable foundation for future investigations of human–dog relationships across Chile and the broader Global South.

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