The Dog-Owner Relationship

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The Cat/Dog–Owner Relationship Scale (C/DORS) is a questionnaire aimed to assess specific aspects of the pet–owner relationship. While the entire scale can be administered to both dog and cat owners, its validity and reliability have never been tested on dogs. Furthermore, validity and reliability of a scale may change depending on the respondents' language and cultural background. Since the C/DORS was developed in English, we aimed to translate it into Italian and assess its validity and reliability on a sample of Italian dog owners. The response scale was modified to improve the variability of the owners' responses. Overall, validity and reliability were good. The scale had the same three-factor structure (Perceived Emotional Closeness = PEC, Pet–Owner Interactions = POI, Perceived Costs = PC) reported for the original English version, although some items were removed because they did not fit the statistical model. The PEC subscale had the highest correlations with the subscales of the Lexington Attachment to Pets Scale. Finally, being a student owner was associated with higher PEC and POI scores. Conversely, owning a dog with behavioural problems was associated with lower PEC and higher PC. Owners whose dogs lived outdoors reported lower POI. Pet dog owners reported higher PEC than AAI dog owners.

Keywords: dog ; owner ; relationship ; MDORS ; C/DORS ; LAPS ; validation ; Italian ; bond ; pet

1. Introduction

From the beginning of the 1980s, several scales have been developed to assess human perception of pet–owner relationship, such as the Pet Attitude Scale (PAS) ^[1], the CENSHARE Pet Attachment Survey ^[2], the Companion Animal Bonding Scale (CABS) ^[3] and the Lexington Attachment to Pets Scale (LAPS) ^[4]. The latter is probably the most widely used scale in human–animal relationship studies ^[5].

1.1. The Lexington Attachment to Pets Scale (LAPS)

The final version of the LAPS was developed by Johnson et al. in 1992^[4] with the aim to create a reliable psychometric tool to assess the level of owners' emotional attachment to their pets. The LAPS items were developed using the Social Support Theory as theoretical framework. More specifically, the authors were interested in the affective aspect of the pet's supportive role to the owner, which is considered the aspect of the relationship that most strongly affects human wellbeing and psychophysical health [6][7]. The scale is composed of 23 items with 0-3 Likert-scale response options that allow the respondents to indicate their level of agreement with each item. In their original study, Johnson et al. [4] found that the LAPS items related to three attachment dimensions that they named "General Attachment", "People Substitution" and "Animal Rights/Animal Welfare". Internal consistency was high for all dimensions, with Cronbach's α being 0.90, 0.85 and 0.80 for general attachment, people substitution and animal rights, respectively. Even when considered as a whole, the scale had excellent psychometric properties (Cronbach's $\alpha = 0.93$)^[4]. Similar factorial structure—although not identical in terms of item distribution within the three-factor model and reliability values-was obtained by Ramirez-Gonzalez et al. [8] in their validation study of the Spanish version of the scale. The LAPS has also been translated into German ^[9] and Italian ^[10]. In both languages, the scale showed good internal reliability, with high Cronbach's α for the subscales of general attachment (German = 0.78, Italian = 0.93) and people substitution (German = 0.80, Italian = 0.82), but lower values for the animal rights/animal welfare subscale (German = 0.69, Italian = 0.65). Nonetheless, the LAPS has some conceptual limitations. Firstly, it focuses on the affective facet of the bond, not taking into consideration other aspects of the relationship that may be just as relevant. Secondly, having been developed for pet owners, in general, its items may fail to address some aspects of the pet-owner bond that may be unique to the relationship with specific pet species.

1.2. The Monash Dog-Owner Relationship Scale (MDORS)

More recently, in response to the need of having a scale that specifically assessed the dog–owner relationship, Dwyer et al. [11] developed the Monash Dog–Owner Relationship Scale (MDORS). Since its creation, the MDORS has been used in

several studies [12][13][14][15][16][17]. Contrary to the majority of the previously used scales that mainly focused on the emotional facet of the pet-owner bond, the MDORS is a more heterogeneous tool that covers both affective and pragmatic aspects of the relationship. It is based on the Social Exchange Theory, which assumes that a relationship between two individuals is maintained or terminated depending on whether the benefits outweigh the costs or vice versa [18]. The MDORS items relate to three underlying dimensions of the dog-human relationship [11]. The Pet-Owner Interaction (POI) subscale reflects both general activities related to the physical care of the pet, as well as to more intimate activities, such as kissing, cuddling and hugging [11]. The Perceived Emotional Closeness (PEC) subscale is composed of items related to social support, affectional bonding, psychological attachment, companionship and unconditional love [11]. Finally, the Perceived Costs (PC) subscale includes items assessing negative aspects of the relationship or, in other words, the financial, social and emotional costs of caring for a pet [11]. The questionnaire has been translated into Swedish ^[19], Spanish ^[17], German ^[20], Danish ^[12] and Dutch ^[21]. In those cases where the translated versions were checked for differences from the original scale, some dissimilarities were observed. For instance, the principal component analysis performed by Schoberl et al. ^[20] on their German MDORS revealed a five-factor rather than the original three-factor model found by Dwyer et al. [11]. Handlin et al. [19] had to remove some items from their MDORS translation when they realised they were being misinterpreted by their sample of Swedish owners. Similarly, in the Dutch translation performed by Van Houtert et al. [21] some items did not fit the original model and consequently had to be removed. Moreover, when testing the subscales for internal reliability they found Cronbach's α values that were well below acceptable levels (POI = 0.43, PEC = 0.19, PC = 0.19). As van Houtert et al. $\frac{21}{21}$ suggest in their study, these findings highlight the importance of a thorough assessment of the validity and reliability of the MDORS when translated to new languages and targeting people from different cultures.

1.3. From the Monash Dog–Owner Relationship Scale to the Cat/Dog–Owner Relationship Scale (C/DORS)

While on the one hand the species-specificity of the MDORS may be considered as one of its strengths, on the other hand it represents a limitation for studies that aim to investigate the pet–owner relationship, in terms of balance between costs and benefits of pet-ownership, across different species ^[22]. Therefore, Howell et al. ^[22] developed the Cat/Dog–Owner Relationship Scale (C/DORS) by grouping into one single scale all the items from the MDORS and the additional items from the Cat–Owner Relationship Scale (CORS), a similar scale specifically designed for cat owners. The C/DORS is based on the same theoretical background and has the same structure as the MDORS. It consists of 32 items with a 1–5 multiple-choice response format. While the entire questionnaire can be administered to both dog and cat owners, only those items belonging to either the MDORS or the CORS must be included in the scoring process depending on whether the target species is a dog or a cat, respectively ^[22]. Therefore, to date, there is no unified scale to assess both dog– and cat–owner relationship in a cost–benefit balance perspective. Furthermore, the C/DORS as a whole has never been validated on a dog-owner sample. By including items from the CORS that are not present in the MDORS, the C/DORS may allow for a more detailed investigation of a wider range of dog–owner interactions. Finally, the C/DORS has not been translated into other languages, except for a study by Bowen et al. ^[23] on Spanish owners, in which some items were removed, and the response options were heavily modified to make the scale suitable to measure changes in the pet–owner relationship during the COVID-19 lockdown.

In light of all the critical points mentioned so far, the aim of this study was to validate an Italian version of the C/DORS among dog owners. We achieved this aim through a series of steps. Firstly, we translated a modified version of the C/DORS into Italian, to administer to a sample of Italian dog-owners. Secondly, we modified the existing C/DORS response options from a 1–5 scale to a 1–7 scale to increase response variability and, consequently, improve the psychometric properties of the scale. Thirdly, we assessed both the internal and the test–retest reliability of this modified version of the scale, as well as its validity through the confirmation of its underlying structure and its possible correlation with a widely used pet–owner relationship scale, namely the LAPS.

2. Discussion

The C/DORS is a relatively new scale that combines all the items from the MDORS ^[11], a widely used scale that assesses the dog–owner relationship, and the CORS ^[22] a similar tool that instead focuses on the cat–owner relationship. While the MDORS has been translated into different languages ^{[12][17][19][20][21]}, it has not been translated or validated in Italian. With regard to the C/DORS, the researchers who first developed it ^[22] suggest that all the items be administered to both dog and cat owners, in multispecies studies. However, the scoring of the scale for each species involves only those items specific to the target species ^[22]. So far, the C/DORS as a whole has never been validated on a dog-only sample, in English or any other language.

The C/DORS version proposed in this study is not a mere translation of the original English version. Instead, we implemented a few changes aimed at improving the validity of the scale, to pave the way for a more suitable use of the C/DORS in cross-species comparisons, that does not require different scoring scales.

The Italian C/DORS for dogs used in this study retained the same factor structure reported for the MDORS, which consists of three factors named Dog–Owner Interactions, Perceived Emotional Closeness and Perceived Costs ^[11]. Nonetheless, several items (i.e., 2, 13, 14, 19, 25, 27 and 29) did not fit the original model.

Item 19 "How often do you feel that having a dog is more trouble than it's worth?" was removed before analysis because of its high skewness. In this case, the great majority of the owners marked the response options with the lowest frequencies. The low response variability for this item may suggest that owners, regardless of the levels of interactions and emotional closeness with their dogs, and regardless of the perceived levels of practical and affective costs of dog ownership, tend to perceive their relationship with their dogs as overall more beneficial than detrimental. Another possible explanation is that our sample of respondents was biased towards owners that are more willing to spend their time completing a questionnaire on their dogs. These owners may be also more likely to care more about their relationship with their dogs ^[22]. On the contrary, owners that are indifferent or perceive their dogs as a burden may not volunteer for such a study. This type of bias, called volunteer bias or self-selection bias ^{[24][25]}, is an issue that cannot be avoided in surveys that are openly advertised on the internet, such as this one. Therefore, caution should be made when interpreting the results in terms of their generalisability to the entire dog owner population ^[25].

Items 2, 14, 25, 27 and 29 were removed because they scored below the cut-off point of 0.3 or, in the case of the latter, because the difference between the loadings in two factors of the PA was lower than 0.1.

Item 2 (My dog gives me a good reason to get up in the morning) appeared to be a problematic item in Handlin et al. ^[19] Swedish translation of the MDORS, as well. However, in their case, the item was eliminated because it was unclear to Swedish respondents whether it referred to a positive or a negative "reason". Although we overcame this problem by specifically referring to "good" reasons—as originally intended by Dwyer et al. ^[11]—this item showed a low loading on both POI and PEC factors.

Item 14 (How often do you feel that looking after your dog is a chore?) had similar low loadings in all three factors, suggesting the absence of a significant or even a preferential association with the underlying constructs of any of them.

Item 25 (How traumatic do you think it will be when your dog dies?) loaded just below the cut-off point in the PEC factor. In a previous study by Van Houtern et al. ^[21] this item caused interpretative issues as it loaded on POI rather than the original PEC. On the contrary, in this study it loaded on the PEC factor, although not enough to suggest an association with the other items in the same dimension. It is possible that the changes made to the response scale in our version of the C/DORS may have altered the answers to this item. In the process of widening the response scale from 5 to 7 points, the original scale, which went from "very traumatic" to "very untraumatic", was converted into "very traumatic" to "a great relief". Such modification was implemented for the following reasons. Firstly, there is no Italian translation for the word "untraumatic". Secondly, the word "untraumatic" reflects the absence of a certain emotional response to a given event. Therefore, it may not make sense to grade the absence of a feeling. Thirdly, the original response options were structured as a bipolar scale (from very traumatic to very untraumatic) although they investigated a unipolar concept (presence/absence of a trauma). Therefore, considering the use of a bipolar scale for item 1, which is structurally similar to item 25, we decided to include opposite attributes at the extremes of the scale. However, considering the results obtained from the PA and the fact that none of the respondents considered the death of their dog to be relieving at any level, a unipolar scale going from "not traumatic at all" to "extremely traumatic" may be a better choice in future studies. Furthermore, finding an appropriate antonym for words with complex meaning, such as "traumatic" may not be an easy task, and the word "relieving" may not have the opposite meaning of the word "traumatic" in absolute terms. In fact, in some instances, the loss of a dog may be both traumatic and relieving, such in the case of a severely or chronically ill animal.

Item 27 (How often do you take dogs to visit people?) did not seem to be a problematic item in previous translations of the MDORS. However, it should be taken into account that our questionnaire was distributed during the COVID-19 pandemic. Contrary to a previous study by Bowen et al. ^[26], which used the C/DORS to investigate the effect of confinement on the dog–owner relationship, we did not remove this item from the scale because a total lockdown was no longer in place during our data collection period. However, it seems plausible that both the ongoing partial social restrictions (e.g., curfew, gathering limitations) and the fear of contracting the virus may still have affected our respondents' social interaction

dynamics ^[27] and, as a consequence, their response to this question. Future research should investigate this possibility by replicating the survey after COVID-19 restrictions have fully lifted.

Item 29 (How often do you take your dog in the car?) was removed as it cross-loaded in the POI and the PEC factors. In the Swedish translation of the MDORS, Handlin et al. ^[19] removed this item in consideration of the fact that not all owners have a car and, as a consequence, their response could be biased. Furthermore, as for item 27, the response to this question may have been altered by actual or self-imposed travel and movement limitations due to the COVID-19 pandemic.

Item 13 (How often you tell your dog things you don't tell anyone else?) was not removed but loaded primarily on a different factor than in the original MDORS, that is POI instead of PEC. The same issue was reported by Van Houtern et al. ^[21] following the translation of the MDORS from English to Dutch. As they suggested in their study, the term "often" implies frequency, which may connect the related item to the POI factor, which measures actual frequencies of interaction, rather than to the PEC factor, that relates to an abstract affective dimension.

As mentioned at the beginning of this paragraph, the C/DORS, as originally developed by Howell et al. ^[22], is the combination of two species-specific pet-owner relationship scales, namely the MDORS for dog owners, and the CORS for cat owners. While some items apply to both dogs and cats, others are specific for a single species. When cross-species comparisons are desired, the authors propose to administer the entire questionnaire to the owners of both dogs and cats, and then calculating the score on different items according to the target species. Although non-species-specific scales for the assessment of some aspects of the pet-owner relationship already exist in the anthrozoological science panorama— e.g., the LAPS ^[4], the PAS ^[1], the CABS ^[3]—none of them investigate the relationship from a cost-benefit perspective. Therefore, in order to take a first step towards the development of a common C/DORS for dog owners (i.e., items 9, 15, 21 and 26). When applied to dog owners, all of these items loaded on the same factor as for cat owners, that is POI ^[22]. While this may represent a first positive result for the development of a C/DORS scale that is equally valid for dog and cat owners, future studies should focus on addressing the role of those items that, although included in this dog-adapted version of the C/DORS, when administered to cat owners may not fit the same model (e.g., load on different factors, or not load on any factors above acceptable levels).

In order to assess the reliability of the C/DORS for dogs we assessed the internal consistency of each of the identified subscales. Compared to original MDORS, the Cronbach's α values appeared to be higher for the POI subscale (C/DORS = 0.84, MDORS = 0.67), similar for the PEC subscale (C/DORS = 0.85, MDORS = 0.84) and lower for the PC subscale (C/DORS = 0.71, MDORS = 0.84). Nevertheless, contrary to the MDORS, Cronbach's α values were above acceptable levels for all the subscales. As the CDORS investigates aspects of the relationship that one may assume do not change over a short period of time, we also tested the C/DORS for test–retest reliability, which was found to be strong for all the subscales.

The construct validity of this new scale was also supported by the confirmation of the original three-factor structure obtained through CFA, as well as by the significant correlation between the three subscales and the CDORS total score. For the latter, it should be kept in mind that PC scores are reversed and therefore a negative correlation with this subscale and the total score is what we actually observed.

In consideration of the LAPS' widespread use in human–animal relationship studies, we assessed the possible correlations between its subscales and the C/DORS subscales, with the aim of providing additional evidence of the C/DORS validity. Before doing so, the LAPS original three-factor structure was tested and confirmed through CFA. Furthermore, the internal consistency of each dimension was verified. Although lower than those reported for the original English version, internal consistency was still found to be acceptable to good for all dimensions. Results from the correlations observed with the LAPS dimensions provides further confirmation on the validity of the C/DORS. In fact, the highest significant correlation was found between the C/DORS' PEC subscale and the LAPS' People Substitute (PS) subscale. This result may be explained by the fact that both dimensions conceptually focus on the owner's perceived role of the pet as emotional support (e.g., LAPS: "I love my dog because he/she is more loyal to me than most of the people in my life", CDORS: "If everyone else left me, my dog would still be there for me"). Overall, among the CDORS subscales, the PEC had the highest correlations with all three LAPS subscales. This is not surprising since the LAPS, as its full name suggests, was conceived to assess the strength of the pet–owner attachment, intended as the emotional bond that ties two individuals. In fact, as Johnson et al. (1992) report in their original paper, all of the LAPS items were selected for their emphasis on the respondent's affection toward the pet. On the contrary, the CDORS is a much more heterogeneous

scale, comprising items that may not necessarily relate to the affective facet of the relationship. This is especially true for the PC subscale that includes items such as "My dog makes too much mess", "There are aspect of owning a dog I don't like" and "My dog costs too much money". This may also explain why, amongst the three C/DORS subscales, the PC had the lowest correlations with all the LAPS subscales.

Some demographic factors of both owners and dogs were found to significantly predict the owner's responses to the C/DORS subscales.

As for the PEC, student owners reported significantly higher scores than both owners who work with animals and owners who do not work with animals, as well as owners who are unemployed. While we find it hard to find a clear and comprehensive explanation for this result, especially in relation to the lower scores obtained by owners who work with animals, we can discuss those variables we believe may have led to this finding. First of all, we should consider the possibility that our sample of student owners was biased towards students from Veterinary Sciences courses because of the social media channels we used to distribute the questionnaire. However, our questionnaire did not discriminate between students from different courses, hence our hypothesis cannot be supported by scientific data. Secondly, the respondents' age may also have played a role in the PEC scores. In fact, Kellert et al. [28] found that people between 18 and 35 years of age have a significantly greater humanistic attitude towards animals than people aged between 36 and 55 years and even greater than people aged over 56 years. In other words, the attitude of young adults towards animals is characterised by greater emphasis on the value of the animal as an individual and on the affective facet of the humananimal relationship, especially in relation to pets [28][29]. Furthermore, previous studies suggest that emerging adults-a term used to identify people aged between 19 and 29 years-tend to regard their dogs as either children or family members [30]. However, the perceived level of the pet's inclusion within the family unit appears to be flexible as it tends to decrease over the course of the owner's life, along with the changes in personal priorities and the beginning of parenthood [31]. However, this explanation remains speculative as the regression analysis did not reveal a direct effect of owner's age on PEC scores. Finally, we should take into account that social restrictions implemented by the Italian government during the period of data collection, may have had a particularly negative psychological and emotional impact on this category of owners, as suggested by recent studies on Spanish [32] and American university students in COVID-19 times [33]. As a consequence, students may have relied on their dogs as a source of emotional support even more intensely than they have been observed to do in normal environmental and social conditions [34].

We do not have either a scientific or a logical explanation for the finding that owners of dogs involved in animal assisted interventions (AAIs) obtained lower scores on PEC compared with owners of dogs that did not perform any activities. It is possible that this result was biased by the low number of dog–owner dyads engaging in AAIs (n = 9), in our sample.

The association between ownership of dogs with behavioural problems and lower scores on the PEC is more straightforward. Hoffman et al. ^[35] found that owners of dogs with separation anxiety or generally misbehaving dogs reported lower levels of attachment. As reported by Buller ^[36], owners of problematic pets may experience a wide range of negative and conflicting emotions such as sadness for seeing their pets suffering, frustration for not being able to help them and anger for the negative effect the dog's behaviour has on their daily life. Such negative emotions are likely to affect the owner's perception of the dog as a source of emotional support.

As for the POI subscale, owners who worked with animals and those who were retired reported a lower frequency of interaction compared to owners who were students. A similar interpretation to the one provided for the association between the "job" demographic variable and PEC scores, can also apply to this finding. In fact, several items belonging to the POI subscale are, to a certain degree, the expression of emotional closeness (e.g., "How often do you kiss your dog?", "How often do you cuddle your dog?", "How often do you hug your dog?"). Indeed, other practical factors, such as the actual amount of time the owner can dedicate to the dog in daily life, may affect the frequency of pet-owner interactions. In this regard, it must be said that the daily routine of animal professionals, especially veterinarians, has not been substantially affected by COVID-19 restrictions, as it is the case for other categories of worker. In fact, in Italy, medical treatment for animals in need was guaranteed throughout the pandemic. On the contrary, attendance to in-person classes was suspended at the time of the data collection. This may have given student owners a greater amount of time to interact with their dogs. As for retired owners, it is possible that the reduction in mobility and daily activities that can occur along with the aging process [37][38] may have played a role in the lower frequency of dog-owner interactions observed in this study. However, we did not have a pool of elderly owners since only the 8% of the respondents were in their 60s, only the 0.2% were in their 70s and none in their 80s or above. Thus, like for PEC scores, this finding may also be explained by the greater emphasis that younger owners put in the emotional aspects of the dog-owner relationship ^[28], which could in turn lead to a higher frequency of kissing, hugging, cuddling, petting and shared experiences. However,

since we did not find a direct effect of age on either POI or PEC scores, nor we investigated owners' health issues that may have compromised their ability to interact with their dogs, this explanation requires further investigation in the future.

Unsurprisingly, owners whose dogs lived indoors or had free access to both indoor and outdoor spaces reported a higher frequency of interactions compared to owners of dogs that had no access to indoor space. This finding is in line with those from Shore et al.'s study ^[39], in which owners of yard dogs reported lower levels of affiliative, playful and physical care-related interactions compared to owners of house dogs. However, the relationship between these two variables does not imply causation. While it may be obvious that owners whose dogs live outdoor have fewer opportunities to interact with them, it is also plausible that owners who already are less motivated to interact with their dogs are also more likely to deny them indoor access.

As for the PC subscale, scores were higher for those owners who reported their dogs to have behavioural problems, regardless of their nature. Accordingly, Van Herwijnen et al. ^[16] reported higher perceived costs in owners of aggressive and disobedient dogs. Furthermore, this result is in line with previous studies that report dog behavioural problems to be one of the most frequent reasons for relinquishment ^{[12][40][41][42]}. Living with pets with behavioural problems may be emotionally and practically challenging as it is likely to lead to increased costs for professional intervention, increased difficulties in managing the pet in both public and private environments and reduced opportunities for social life ^[36].

Limitations of this study mainly relate to its nature as a questionnaire-based research. As mentioned above and as reported by Howell et al. ^[22] in their study on the CORS, self-selected participants may bias the sample towards owners that care more about their pets and have an overall more positive perception of the relationship with them. This may also explain why our sample consists mainly of female owners as well as owners residing in urbanised areas. Greater female involvement in human–animal relationship studies is not uncommon as women have been found to be more empathetic than men towards animal-related issues ^{[43][44][45][46]}. Similarly, people living in urban areas are reported to have a more positive attitude towards animals than people coming from a rural background ^[47]. The great number of dogs that were reported to live indoors is likely to be a consequence of the greater proportion of respondents living in urban areas.

Another important consideration should be made on the timing of data collection, which occurred during the COVID-19 pandemic. Although previous studies that investigated the effects of the pandemic on dog–owner relationship focused on the lockdown period ^[26], the partial social restrictions ongoing in Italy during the time of our study may still have affected our results. A similar investigation carried out after people's life will return to normality may confirm or confute this possibility.

3. Conclusions

In conclusion, the C/DORS for dogs used in this study appears to be a valid and reliable instrument to assess Italian owners' perception of the relationship with their dogs. A major difference from previous similar questionnaires, such as the MDORS and the CORS, is the wider range of response options that may help increase the response variability to all items. Furthermore, this scale seems to overall improve the psychometric properties of the original MDORS, as witnessed by Cronbach's α values above acceptable levels for all the subscales. Therefore, we recommend its use even in single-species investigations. Similar studies carried out on samples from different countries are necessary to confirm the validity of this scale for owners speaking different languages and with diverse cultural backgrounds.

This scale paves the way for future studies aiming to develop a common tool for the assessment of both dog– and cat– owner relationships, in terms of cost–benefit balance. Items, such as "How often do you take your pet to visit people?" or "How often do you take your pet in the car?" that had to be excluded from the original C/DORS cat owner scoring process, are no longer present in this new C/DORS version. On the opposite, items that were only included in C/DORS cat scale that is the CORS—were found to fit the model applied to dog owners, as well.

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