



## Research

## Behaviors Indicative of Attachment with Pets Scale: An adaptation of the attachment during stress scale for companion animals



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## ABSTRACT

This article introduces a Spanish-language assessment tool for the evaluation of behaviors that are indicative of attachment to aid research into human-animal interaction. The psychometric properties of the adapted scale to simultaneously quantify the attachment are presented. A confirmatory factor analysis and a convergent analysis with the Mexican version of the Lexington Attachment to Pets Scale were performed using a sample of 397 human-animal dyads (21.4% cats and 78.6% dogs). A second study with an international sample ( $n = 107$ ; 32.7% cats and 67.3% dogs) was performed to evaluate the English-language version of the scale. The findings provided evidence for the scale's and subscales' reliability and validity, with better values in the subscale associated with the human's behavior. The differences between human-human interaction and human-animal interaction in a modified version of the Ainsworth's Strange Situation Test are presented. Implications for future research using this model, in which the reciprocal behavioral process within dyads (human-domestic animal) may be assessed, are discussed.

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## Introduction

Bonding and attachment, fundamental concepts in human-animal interaction (HAI) research, affect dyads, whether the relationship is one of worker partners or pets and owners (Payne et al., 2015).

Bonding can be shown as a social behavior as it provides the opportunity to be part of a group (Suomi, 2005). Behaviors like play are natural in the domestic context and in the wild. Within the domestic dog's population, play presents differently depending on whether the owner or a stranger is initiating the play (Virányi et al., 2004), leading to questions regarding the nature of the dog-owner relationship and level of attachment.

The hypothesis concerning differential play includes that reinforcement due to previous interaction affects the dog's reaction (Handlin et al., 2011). As laboratory research, it remains to assess

what would be a normal attachment: what do owners perceive—in their daily relationship with their pets—as their common way to show attachment to their pets? Which animal behaviors are considered signs of the pets' attachment? In this article, we examined both questions simultaneously by providing direct behavioral indicators of the human-animal attachment.

Many human-human interaction theories are based on nonhuman research and are significant for several topics regarding health and social issues across our life span (Hooper, 2007; Zachrisson & Skårderud, 2010). Human attachment theories are a primary resource within the HAI field, and we relied heavily on Bowlby's (1998) and Ainsworth's (1978) theories in this report.

Bowlby's attachment theory relates to a predisposition for future peer relationships and the development of social networks found in primates (Suomi, 2005). This theory describes human attachment with a common emphasis on the presence of close emotional bonds (Guedeney et al., 2008; Kuflyak, 2015). Such bonds predict the formation and maintenance of future relationships (Hooper, 2007) and affect adjustment or changes during the life cycle (Kuflyak, 2015). Attachment in HAI includes the same nuclear concept and is described as a bond between 2 individuals in which closeness and emotional factors are the primary elements (Bowlby, 1998; Payne et al., 2015).

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In humans, Ainsworth's Strange Situation Test led to the development of a screening test, the Attachment During Stress Test (ADS; Massie & Campbell, 1983), which detects potential problematic interactions and identified deviant responses of both mothers and children in routine medical interviews (Cárcamo et al., 2014).

Nowak and Bovin (2015) and Topál et al. (2001) established that observational criteria in HAI should include preferring one individual, seeking and maintaining proximity, responding to separation, and using the attachment figure as a secure base just as in Ainsworth's patterns of human behavior. Moreover, a dog's attachment to its owner was investigated in terms of distress due to separation using Ainsworth's model (Payne et al., 2015). The results indicated similarities between dog-human interaction and the parent-child bond (Prato-Previde et al., 2003; Storengen et al., 2014) and the possibilities of change thanks to constant social interaction after spending time in a shelter (Topál et al., 2001).

Little is known about a cat's attachment to its human. Cats' socialization is influenced when they are handled as kittens during their socialization period (Casey & Bradshaw, 2008). There is a better chance of adaptation when litters come from well-adapted parents (McCune, 1995). Unfortunately, research on cats lacks an extensive corpus of data, with profound differences between professionals' and owners' knowledge about the behavior of cats (Da Graça Pereira et al., 2014). As with dogs, more data are needed to understand animals' normal interaction with its owners.

HAI research includes self-reported research. Many of the instruments used in the field have not been tested for reliability and validity (Anderson, 2007). Wilson and Netting (2012) recently identified 140 instruments that assessed characteristics of HAI including characteristics, attitudes, and the nature and type of human-animal relationships, and noted the aforementioned reliability and validity problems. Few tools have been adapted for Spanish-speaking populations.

The present research tested an evaluation tool designed to assess the baby-caregiver dyad, following Ainsworth's patterns of attachment, in samples of dog-owner and cat-owner dyads, both in Mexican and international populations. In contrast to other research, the present study tested behavioral clues within the domestic household rather than a laboratory. In addition, while most other research has assessed the relationship of the dyad according to what the owner or observer appraisal, we assessed the animal-human bond by simultaneously coding and analyzing behaviors, focusing on the development of an intrameasure scale's validity and reliability (Payne et al., 2015).

To achieve our aim, the Behaviors Indicative of Attachment with Pets Scale (BIAPS) was based on the ADS (Massie & Campbell, 1983), an instrument not previously used in HAI.

The ADS screens mother-infant attachment in stressful situations. It is designed for use in populations from birth to 18 months of age and follows the observation of the behavioral patterns assessed during the Strange Situation Test as "normal," "avoidant," or "anxious" (Ainsworth et al., 2015). The scale includes 2 subscales with 7 items each that individually correspond to an aspect of mother-child behavior (gazing, touching, holding, proximity, facial expressions, and vocalization). A complete assessment includes information obtained from the mother while she interacted with the child and vice versa.

For scoring, the ADS presents 5 possible responses ranging from 1 to 5, an extra option for nonobserved behaviors. Normal behavior usually scores 3 to 4 points, scores between 1 and 2 suggest avoidance of contact (i.e., not responding to the other's display of tension or attempts at attachment) and a score of 5 indicates overanxious, intense interaction, or an unusually strong reaction to stress (Massie & Campbell, 1983).

Within human populations, the ADS presented both validity and reliability results through different populations (Cárcamo et al., 2014). In clinical research, reliability had been  $\alpha = 0.83$  and  $\alpha = 0.89$  (Kotliarenco et al., 2009; Massie & Campbell, 1983). The reliability in an experimental study with adoptive and nonadoptive families was  $\alpha = 0.81$  and  $\alpha = 0.86$  for the infant and mother subscales, respectively (Chan, 1987). The scale's convergent, concurrent, and construct validity allowed it to be used as a screening device in Dutch populations (Cárcamo et al., 2014) where moderate validity was found with single items identified as problematic in both the mother and child assessment: "holding" and "affect" items, respectively.

While considering previous information, the objective of this research was to evaluate the psychometric properties of the BIAPS, a tool based on the ADS, using a Mexican sample for the Spanish-language version and an international sample for the English-language version.

## Methods

### Participants

Two different samples were included in this research: one local (the Mexican sample), the other formed by people living outside of Mexico (international sample). In both cases, we followed a self-selected sampling procedure: both male and females older than 18 years old were able to voluntarily participate. To be eligible, each person needed to have at least 1 pet, either a cat or dog, living with him or her in at least the last 6 months. No education or socio-demographic criteria were used as exclusion criteria, but participants had to be capable of responding to the questions in English.

Only the responses from individuals who completed the entire survey were included in the research, and no reward or penalty was provided for completion or noncompletion of the survey. No approval from an ethical committee was required, but participants were instructed that they could stop answering questions at any time and that their answers would be anonymous.

### Participants of the Mexican study ( $n = 397$ )

Invitations were sent through a local organization (Monterrey Pet-Friendly, an organization dedicated to improving pet-friendly culture in public places such as restaurants and malls in Monterrey, a city in North Mexico) and social media (Facebook) to participate in an online study.

### Participants of the international study ( $n = 107$ )

For recruiting the international sample of pet owners, several organizations (*Internet Cats* and *Companion Animal Psychology Blog*) were contacted via Facebook and e-mail and were asked to post the invitation to participate in the online study.

### Procedure

We used an online survey system (SurveyMonkey) to gather responses. The survey was available for 10 weeks from the notification date of the survey's availability for both studies (Mexican and international). Participants were told that their responses would be used to construct an instrument that measures how people relate to their pets. When responding to the questionnaires, participants in multidog or multicat households were asked to specifically think about their interactions with 1 pet (either a dog or a cat). This approach was designed to help the participant focus on 1 significant animal, and he or she was encouraged to recall the types of events encountered during the interactions. Our approach was intended to

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