



Research

Effects of learning on social and nonsocial behaviors during a problem-solving task in shelter and pet dogs



Gabriela Barrera^{a,b}, Jesica Fagnani^{a,b}, Fabricio Carballo^{b,c}, Yamila Giamal^b, Mariana Bentosela^{b,d,*}

^a *Icivet Litoral (Instituto de Ciencias Veterinarias del Litoral), Faculty of Veterinary Sciences—UNL-CONICET, Esperanza, Santa Fe, Argentina*

^b *Canids Behavior Research Group (ICOC), Medical Research Institute (IDIM; CONICET-UBA), Buenos Aires, Argentina*

^c *Biological and biomedical research Institute of the South (IMBIOSUR; CONICET-UNS), Bahía Blanca, Buenos Aires, Argentina*

^d *Medical Research Institute (IDIM; CONICET-UBA), Combatientes de Malvinas, Buenos Aires, Argentina*

ARTICLE INFO

Article history:

Received 7 August 2014

Received in revised form

10 March 2015

Accepted 17 March 2015

Available online 26 March 2015

Keywords:

problem solving

social and nonsocial response

pet dogs

shelter dog

ABSTRACT

Many lines of evidence show differences between the communicative skills and social responses of dogs kept in shelters (SHDs) for long periods of time compared with pet dogs (PDs). The purpose of this work is to investigate whether there are also differences between these groups in a nonsocial problem-solving task consisting of dislodging nine plastic bones placed in a bowl to obtain the food hidden underneath it. The procedure comprised 3 phases: reinforcement, extinction, and reacquisition. In study 1, a second goal was to study whether, in the course of resolving the said task, the dogs exhibit different social responses in the presence of a stranger who remained seated near the apparatus in a passive attitude throughout the test. Results demonstrated that PDs spent longer time interacting with the apparatus throughout the 3 phases, which probably indicates greater persistence of reward-seeking behavior, compared with SHDs. This difference may relate to the fact that PDs have been more frequently exposed to partial reinforcement processes during their everyday life and have thus increased their resistance to extinction. On the other hand, during the extinction phase when no food was left, SHDs remained near for a longer time and gazed more at the person than PDs. This might indicate that the person was a stronger stimulus for SHDs as they are more deprived of social contact with people in their everyday life, which proves how the experiences during ontogeny shape the relationship between dogs and humans. The second study showed that PDs spent more time interacting with the apparatus compared with the SHDs, even in the absence of the person. These results indicate that PDs are more persistent in the reward searching response, whereas SHDs have a higher social motivation.

© 2015 Elsevier Inc. All rights reserved.

Introduction

The ability to solve problems has been studied in dogs using a wide variety of tasks (Scott and Fuller, 1965; Miklósi et al., 2003; Osthaus et al., 2005). Several pieces of evidence show that dogs frequently resort to human communication cues as tools to solve different problems, although the underlying mechanism is still

under discussion (Miklósi et al., 2003; Bentosela et al., 2008; Udell et al., 2010a). One of the major debates regarding the remarkable communication skills displayed by dogs in their interactions with humans relate to how the development of such skills is contingent on the learning and experiences acquired during ontogeny. Some authors posit that they are the result of domestication and are somewhat independent of ontogeny (Hare et al., 2010), whereas others postulate that ontogeny would play a more significant role (Udell et al., 2010a).

A way of contributing evidence toward clarifying the debate is to assess dog populations with varying levels of everyday interaction with humans, such as those that occurs with shelter dogs (SHDs) compared with pet dogs (PDs) (Udell et al., 2010a). If ontogeny shapes communication skills, these skills would be somewhat

* Address for reprint requests and correspondence: Mariana Bentosela, PhD, Instituto de Investigaciones Médicas (IDIM) CONICET-UBA, Combatientes de Malvinas 3150, 1426 Buenos Aires, Argentina. Tel.: +54-011-9-45148701; fax: +54-011-45148708.

E-mail address: marianabentosela@gmail.com (M. Bentosela).

impaired by limited social contact with humans. In this sense, the evidence shows that SHDs and PDs were equally able to follow simple cues (point to correct, mark correct, shake correct, and shake empty) to find food (Hare et al., 2010). However, SHDs failed to follow a relatively complex human cue such as momentary distal pointing to a target location (Udell et al., 2008). Nevertheless, they were able to learn the task with additional training (Wynne et al., 2008; Udell et al., 2010b). Also, SHDs had poorer performance than PDs when discriminating some cues indicative of the attentional state of humans, such as differentiating between someone reading a book and someone looking straight ahead (Udell et al., 2011).

Gaze is one of the most important nonverbal communicative responses in the communication of several species (Emery, 2000). There is evidence showing that, when faced with an unsolvable task involving an inaccessible reward, dogs tend to gaze at the human face to gain access to the reinforcement (Miklósi et al., 2003; Marshall-Pescini et al., 2008, 2009). Barrera et al. (2012) demonstrated that there are no differences between SHDs and PDs regarding the duration of their spontaneous gaze at the human face to ask for food when it is visible but out of their reach. Furthermore, Barrera et al. (2011) observed that there were no differences in the acquisition of this response during the reinforcement phase. However, gaze duration in SHDs was shorter during extinction, that is, lower persistence of their communicative response when it no longer led to obtaining food. These results would indicate that both groups differ in their gaze response; however, the differences observed may likely be related to characteristics inherent to the extinction process rather than to the fact that it is a communicative response. In such case, SHDs should also be less persistent regarding the extinction of other types of nonsocial types of learning that do not involve communicative interaction with humans. As far as we know, there are no data comparing the resolution of nonsocial problems among SHDs and PDs.

Therefore, the purpose of this article is to first compare the acquisition, extinction and reacquisition phases in SHDs and PDs during a nonsocial problem-solving task. This would also contribute to clearing up the results obtained by Barrera et al. (2011), showing that PDs are more persistent than SHDs both in social and nonsocial tasks. Second, considering that dogs tend to ask for help when faced with an unsolvable problem (Miklósi et al., 2003; Marshall-Pescini et al., 2008, 2009), a person will remain near the apparatus in a passive and indifferent attitude toward the dog to evaluate if both groups differ in their social and communicative responses. Taking into account that several lines of evidence show that SHDs are strongly motivated to interact with people (Gácsi et al., 2001; Barrera et al., 2010) even more than PDs (Barrera et al., 2010), SHDs would seemingly exhibit more social contact-seeking responses and requesting behaviors than PDs. Finally, to evaluate if the presence of a person has any influence on dogs' performance in this problem solving-task, we ran a second study in which PDs and SHDs had to solve the same problem but in the absence of any person. The results of this study assess whether SHDs exhibit differences in problem-solving ability during a nonsocial task, compared with PDs.

Study 1

Materials and methods

Subjects

The subjects comprised 26 adult dogs (*Canis familiaris*). Thirteen of them (4 males and 9 females), belonged to the "Esperanza" Shelter (SHD group), located in the province of Entre Ríos, Argentina. The rest (6 males and 7 females; mean age: 6 years, standard deviation [SD]: 2.63) were PDs (PD group). They were all

mixed breeds and had received no previous training. The age of the SHDs was unknown, but they had lived in the shelter for at least 2 years before the test; and according to the veterinary staff, they were younger than 10 years. Their background history was not available. They were all in good health.

The SHDs were kept in kennels (2 m high × 4 m long × 2 m wide). Each kennel had 4–7 dogs. The shelter had a recreational area where dogs were allowed to walk for 15–20 minutes a day, taking turns with each kennel group. Their contact with shelter staff was limited to feeding and cleaning activities.

The selection criteria used for PDs was to choose dogs that had spent most of their lives in a household and had daily interaction with their owners inside the house. A total of 9 SHDs and 10 PDs had already been assessed in other tasks (socialization test and gaze at the human face task). None of the dogs had experience with problem-solving tasks.

Two additional dogs that did not eat any reward during the first trial were excluded from the sample.

Apparatus

The experiment was conducted at the location where the dogs lived. In the case of the SHDs, the observations were made in a 2 × 3-m enclosure situated some 10 m away from the kennels and with no visual contact with the facilities. On the other hand, the PDs were evaluated in one of the rooms of the house having a similar surface area to that used for the SHDs.

The apparatus used was a game for dogs from "Dog Magic, Nina Ottosson interactive toys" consisting of a round bowl, 36 cm in diameter, with 9 bone-shaped depressions containing nine plastic bones. Each bone has a small hole to release the smell of food. There are 8 bones arranged in a circle and a ninth one in the center. Small pieces of cooked liver were used as reinforcement and were hidden under each bone. In addition, the whole bowl surface was spread with large quantities of liver to distribute the smell evenly.

The device was placed on a carpet (75 × 45 cm) to prevent slipping. A woman unknown to the dog (the experimenter, E) sat down on the floor 1 m away from the apparatus. A person was placed at a distance of 1 m in a straight line from the apparatus to tape the sessions. Figure 1 illustrates the experimental setting used. Sessions were all taped with a Sony DCR TRV 310 camera (Sony CO., China). Each session was attended by the dog, the E, and the person operating the camera.

Procedure

The dogs were exposed to a problem-solving task consisting of dislodging the bones from the apparatus to obtain the piece of liver hidden under each bone.

Both, the SHDs and the PDs, underwent a previous familiarization period of approximately 3 minutes at the trial site. The apparatus was not present in the room during the familiarization but the cameras.

The procedure comprised 3 phases, namely acquisition, extinction, and reacquisition.

Acquisition Phase. This phase consisted of 3 trials. The first trial was of continuous reinforcement, so that all bones contained food. The inter-trials intervals were of approximately 1 minute, the time it takes the E to refill the apparatus with food and smeared it with liver. In every inter-trial and inter-phase intervals, the E smeared the apparatus with abundant liver to control for olfactory clues.

At the start of the trial, a guide left the dog in the room, where the person in charge of taping, the E, and the apparatus were already present. If the dog did not spontaneously approach the apparatus for interaction within 1 minute, the E called it by its name and, while pointing at the apparatus, lifted the bone to show the hidden food and let the dog eat. A similar instigation was repeated

Download English Version:

<https://daneshyari.com/en/article/10961768>

Download Persian Version:

<https://daneshyari.com/article/10961768>

[Daneshyari.com](https://daneshyari.com)