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## Research

## Effect of the presence of a person known to the cats on the feeding behavior and placement of feeders of a domestic cat colony

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## ABSTRACT

Knowledge of the organization and dynamics of the relationships between animals and the environment and its resources is important to meet the needs of any species. We analyzed the effect the presence of a person known to the cats had on their feeding behavior, and the effect of how the cats used the feeders on a colony of 35 domestic cats who lived in a sanctuary. Cats were observed for 24 hours per day for 5 days in the feeding area of the enclosure. Our results indicate that the individuals in the colony organized themselves within their feeding area, with some of these individuals using a specific feeder, whereas others used both feeders. Individuals consistently exhibited increased feeding behavior in the presence of a human who provided fresh food ( $\bar{x} = 4.11 \pm 0.62$  minutes when humans were present compared with  $\bar{x} = 0.17 \pm 0.01$  minutes when that human was absent,  $P < 0.0079$ ). These data reveal that the members of the colony organized themselves to access existing resources in the environment and that the presence of a person known to the cats influences the feeding behavior of those animals. This information helps promote a potentially comfortable environment, with respect to intraspecific relationships and the animal-human relationship, an important consideration in management of this species when living in confined environments.

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## Introduction

Under both feral and domestic conditions, domestic cats gather according to the availability of resources (Bonanni et al., 2007; Crowell-Davis et al., 2004). Moreover, cats organize themselves based on access to resources, which affects behavior, the organization of rest, defecation or urination, and feeding places (Crowell-Davis et al., 2004). Feeding behavior is important, and felids are considered behavior-specialized carnivores or “hypercarnivores” (Legrand-Défretin, 1994; Bradshaw et al., 1996; Sturgess and Hurley, 2007; Bradshaw et al., 2012).

Previous studies have attempted to unravel the social organization of cats with respect to feeding and sociability (Yamane et al.,

1997; Knowles et al., 2004; Bonanni et al., 2007; Dantas-Divers et al., 2011; Damasceno and Genaro, 2014). Knowles and colleagues (2004) investigated a colony of 28 domestic cats and showed that the animals organized themselves to feed on a single feeder. In this study, “antagonistic” interactions (subtle behaviors indicating “submission” or “dominance”) among individuals signaled organization between individuals.

Within the social universe of domestic cats, other types of relationships also serve as primary and modulatory behaviors, beyond those existing with their conspecifics, that is, relationships maintained with humans. These relationships can arise in the absence of consistent patterns of interactions among cats but are independent of the humans to whom the cats relate (Bradshaw et al., 2012). Thus, the different motor patterns used in communication between cats and humans are also used between cats (Kerby and Macdonald, 1988). Behaviors that demonstrate the affiliative relations among conspecifics, such as “allogrooming,” “allorubbing,” “nose touch,” and resting together (Bradshaw, 2000; Crowell-Davis et al., 2004; Rochlitz, 2005) are also often performed with humans. However, interactions among cats and humans differ in

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terms of petting, grooming, and feeding (Bradshaw and Cook, 1996). The feeding time is crucial event in the human-cat relationship because this time point creates a bond with the specific family member who regularly feeds the cat (Karsh and Turner, 1988). Bradshaw and Cook (1996) analyzed the behaviors of 36 residential cats prefeeding and postfeeding. They identified prefeeding behaviors that involve vocal, tactile, and olfactory components and found that some of these are directed at the owners, such as rubbing the head, flank and tail, looking at the owner, meowing, and spending time next to the owner. These behaviors also occur between the cats in a colony under various conditions. However, any differences in the relationships between the individuals within a group and with humans have remained unclear, because of their complexity and subtlety (Crowell-Davis et al., 2004).

Knowledge of the organization and use of resources in the environment among animals, as well as their relationship with humans, promotes the development of satisfactory environmental and social strategies for the welfare of the species (Mertens and Turner, 1988; Crowell-Davis et al., 2004), and facilitates their management. We sought to analyze the organization of individuals in a colony of cats that live in a sanctuary, with respect to their habitual feeding behaviors at their feeders and their relationships to a person known to the cats. We hypothesize that cats organize themselves to best use the feed in their environment and that the presence of a person known to the cats influences the feeding behavior of these animals.

## Materials and methods

### Housing conditions

The study was conducted in a sanctuary for domestic cats in Ribeirão Preto, São Paulo, Brazil. The experiments were performed in one of the sanctuary catteries, cattery III, which has a total area of 112.41 m<sup>2</sup> consisting of a ground level of 97.09 m<sup>2</sup> and vertical areas (shelves, tables, swings, and suspended beds) of 15.32 m<sup>2</sup>. Based on these data, the density for each animal in the environment was 3.22 m<sup>2</sup>, which exceeds the value recommended by Rochlitz (2002). Of the aforementioned area, 12.09 m<sup>2</sup> consisted of a masonry area that was covered and reserved for food and as a dormitory. The remainder of the cattery consisted of an open area that allowed the animals to travel freely. However, all the space was enclosed with screens to ensure the safety of the cats.

An employee cleaned the cattery once per day using water and a cleaning product, Herbalvet, benzalkonium chloride (Ourofino, Craven, São Paulo, Brazil) as needed. A veterinarian administered vaccines, antiparasitic control agents, and treated the animals when necessary.

### Animals

The colony consisted of 35 adults (23 females and 12 males), all of which were neutered or spayed and did not belong to any defined breed. New members had not been introduced to the group for approximately 5 years, which ensured a stable colony, as demonstrated by the low numbers of conflicts between individuals (see Results section). The animals had daily contact with humans, including caretakers, veterinarians, and biologists. Each individual colony member was assigned a record that included a name, identification number (referring to the coat color and sex), and photos (one of the face and another of the right side of the body). The animals were identified by the images in this record and by the patterns of marks on body. The identification number was used throughout this study to represent the individual animals.

The cats were fed a specific feline dry diet and water *ad libitum*, and both were replenished once a day. Importantly, the feeding of the animals was not changed for the study. The experiment was conducted with a dry cat food (Max [Total Alimentos SA, Três Corações, Minas Gerais, Brazil]), and any replacement occurred in the customary manner.

The dry cat food was arranged in 2 feeders (2.20 m in length, 5 cm in depth, and 9 cm in width). These feeders were composed of polyvinyl chloride tubes that were cut in half and installed 1 m from the ground. The feeders faced each other and were separated by masonry that ended at the feeders to allow the animals to access the top. The animals had access to the feeder from a platform that was 2.20 m in length and 50 cm in width and was attached to the wall at a distance of 16 cm from the feeder (to allow access by the animals). Thus, the feeding area consisted of the access platforms and the feeders. Other people than those present during feeding were known to them and present during the day inside the enclosure for management and cleaning. Because the contact of these individuals was not related to the cats, feeding during these periods was not recorded in the study.

### Person known to the cats

To determine whether the presence of a person known to the cats would change the behavior of the individuals in the colony during feeding, the first author of this article was present in a controlled manner during the replacement of the dry cat food (see the Procedures section). Importantly, the experimenter had prior contact with the animals and had been involved in their daily management for 3 years, cleaning their environment, providing medical treatments applying regular and planned environmental enrichment and providing and preparing the food in general. Thus, the cats could consider the experimenter as a known person.

### Procedures

The behaviors performed in the feeding area (platforms and feeders) were recorded in blocks of 6 hours for 24 hours over a period of 5 days using 2 Intelbras VM300 cameras (Intelbras SA, San José, Santa Catarina, Brazil). The images were recorded on Sony DVDs (Sony Electronics, San Diego, CA, USA) and subsequently analyzed. In total, 120 hours of behavior were recorded. The cameras were installed at the top of the feeders, allowing clear identification of each subject. To investigate the influence of the presence of a human on the animals' feeding behavior, the researcher replaced the food once per day at 17 hours, which took approximately 1 minute. There was only one daily feeding time, and it was at the time the cats had been fed before the experiment. We then compared the frequency of the feeding behavior (during the 1-minute replacement of cat food) with the frequency of feeding in the absence of the experimenter for the same interval of time (1 minute) during the period of observation. The experimenter did not make audible or physical contact with any cat during the replacement, so only the effect of her presence during the replacement period was evaluated. To analyze possible preferences for fresh or old cat food, the feeder was divided in half by marking it with an adhesive, and the food was replaced as follows: older food was always placed on the left part of the feeder (the food remaining from the previous day), and the fresh food was placed on the right part of the feeder so that the freshness of the food could be identified throughout each experimental feeding period. All the animals had access to both feeders, and both feeders were filled with both types of food (fresh and leftovers). Finally, the arrangement of the feeders (facing each other) allowed the concurrent identification of fresh and leftover food odors that are attractive to animals.

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