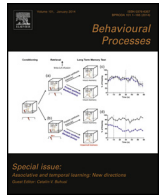




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Dogs and their human companions: The effect of familiarity on dog–human interactions

Andrea Kerepesi^{a,*}, Antal Dóka^a, Ádám Miklósi^b

^a Department of Ethology, Eötvös Loránd University, Hungary

^b MTA-ELTE Comparative Ethology Research Group, Budapest, Hungary

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ABSTRACT

There are few quantitative examinations of the extent to which dogs discriminate between familiar and unfamiliar persons. In our study we have investigated whether dogs show differential behaviour towards humans of different degrees of familiarity (owner, familiar person, unfamiliar person). Dogs and humans were observed in eight test situations: (1) *Three-way strange situation test*, (2) *Calling in from food*, (3) *Obedience test*, (4) *Walking away*, (5) *Threatening approach*, (6) *Playful interaction*, (7) *Food inhibition test* and (8) *Manipulation of the dog's body*.

Dogs distinguished between the owner and the two other test partners in those tests which involved separation from the owner (Test 1, 4), were aversive for the dog (Test 5) or involved playing interaction (Test 6). Our results revealed that the owner cannot be replaced by a familiar person in situations provoking elevated anxiety and fear.

In contrast, dogs did not discriminate between the owner and the familiar person in those tests that were based on obedient behaviour or behaviour towards an assertive person (Tests 2, 3, 7 and 8). Dogs' former training experience reduced the difference between their behaviour towards the owner and the familiar person in situations requiring obedience but it did not mask it totally. The dogs' behaviour towards each of the humans participating in the tests was consistent all over the test series.

In summary, dogs discriminated between their owner and the unfamiliar person and always preferred the owner to the unfamiliar person. However, the discrimination between the owner and the familiar person is context-specific.

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1. Introduction

Many dogs enjoy life in human families which presents a challenging social environment to them. Unlike their wild relatives, which live in relatively permanent social units, companion dogs may encounter frequently con- or hetero-specific beings which vary in familiarity. The development of tolerance towards unfamiliar or familiar people (and dogs) is one key factor in everyday dog socialisation and training. It is expected that dogs show tolerance towards humans and other dogs during walk, in dog play areas, and at dog training schools. This concept of 'friendliness'

('amicability') was exposed in several recent publications (e.g. [Ley et al., 2009](#)).

Nevertheless, there is relatively little information on how dogs behave towards humans who differ in familiarity. Social relationships based on familiarity can vary broadly, and may depend on the individual characteristics of the partners. In this paper we define 'familiarity with people' as the result of regular encounters of friendly nature with humans who are not member of the dog's social group. Such social relationships (e.g. owners' friend, grandmother, neighbour) with people may be particular for dogs living in human families.

Many investigations showed that dogs readily discriminate between their owners and (neutral or friendly) strangers however the magnitude of the effect is often context dependent. Companion dogs showed more attention towards their owner in spontaneous situation ([Mongillo et al., 2010](#)) or when the owner was pretending to search ([Horn et al., 2013b](#)). Dogs also reacted

* Corresponding author at: Department of Ethology, Eötvös Loránd University, Pazmany Peter s. 1/c, H-1117 Budapest, Hungary. Tel.: +36 13812179; fax: +36 13812180.

E-mail addresses: amolnaar@gmail.com, akerepesi@gmail.com (A. Kerepesi).

differently to the presence of the owner or a stranger in the so called 'Strange Situation Test' (Topál et al., 1998; Palmer and Custance, 2008; Palestrini et al., 2005; Prato-Previde et al., 2003). Dogs played and spent more time exploring the room in the presence of the owner, while they were standing for longer duration at the door in the absence of the owner. Dogs showed higher levels of contact seeking with a shorter delay towards the entering owner compared with the stranger, and in parallel they displayed more intensive greeting behaviour at reunion. These results were taken as evidence that dogs are able to form an individual specific attachment relationship with their owner that is analogue to the mother–infant attachment (for review see Topál and Gácsi, 2012).

Györi et al. (2010) compared the behaviour of dogs in playful and threatening situations when they were interacting either with the owner or a stranger. Most dogs were tolerant towards the owner in both contexts; the playful interaction observed between dogs and their owners or strangers was indistinguishable. In contrast, dogs showed clear signs of avoidance when they were facing a stranger in an agonistic situation. Dogs seemed to be less discriminative towards humans in another study on playing interactions (Tóth et al., 2008). In this experiment dogs participated in four play sessions: ball games and tugging games with a stranger or with the owner. In this case the dogs' behaviour was influenced by their motivation to play rather than the familiarity of the test partner. Similarly, the owner and a stranger were equally successful in influencing the choice behaviour of dogs searching for food (Marshall-Pescini et al., 2011).

Only a few studies investigated how dogs' behaviour may be affected by interactions with different members of the family. Horn et al. (2013a) aimed to discriminate between familiarity and ownership by including people who differed in the quality of their relationship. They found that dogs are more interested to watch the owner than the other familiar person. This study is important because it also emphasises the specific, individualised role of the owner in the dogs' life.

Although these studies described above are relatively new, there has been little methodological discussion about social context in which family dogs are tested in the laboratory. For example, dogs participating in personality testing were accompanied either by their owner or a familiar person (e.g. Svartberg, 2005). In the investigations reported by Max-Planck Institute for Evolutionary Anthropology (e.g. Scheider et al., 2011) dogs are routinely tested either in the absence of their owners or in the presence of a stranger (according to our characterisation above). Based on Horn et al. (2013a) one may hypothesise that the presence or absence of the owner and familiarity of the experimenter may affect the behaviour and performance of the dog.

The main aim of the present study is to provide further evidence on context-dependent discrimination among strangers, familiar persons and the owner in dogs. Earlier studies found that the owner–dog relationship is specific when compared to the dogs' attitude towards a friendly or neutral stranger. Here we wanted to see whether dogs showed similarly strong owner-preference in the presence of a familiar person (who was not a family member) with whom they also shared a rich social relationship.

In contrast to earlier investigations we compiled a test battery that represents a relatively broad range of interactions which may take place in experimental situations. Tests applied to the same dog population can be divided into two categories. In four test situations (Tests 1, 4, 5 and 6, see below) we investigated dogs' attachment behaviour (sensitivity to separation) and playful interaction with humans, and in the remaining four test situations (Tests 2, 3, 7 and 8) we observed the differences in obedience in the presence of the different persons.

2. Method

2.1. Subjects

Twenty dogs (10 males and 10 females of various breeds, age 3.1 ± 1.6 years (mean \pm SE)) took part in this study (for participants' data see Appendix). Dogs had various levels of training experience. All dogs participated in the tests with three human partners being present at the same time: the owner, a familiar woman, and an unfamiliar woman. Owners were volunteers chosen from the database of the Family Dog Project (<http://familydogproject.elte.hu>) or were recruited in dog training schools. The 'owner' by definition was the person who perceived herself as the owner of the dog. In a questionnaire (Kerepesi et al., manuscript in prep) we showed that the person, who considers her/himself to be the owner of the dog, is the same person to whom other family members attribute the ownership.

Human gender has also a significant effect on dog's behaviour (Wells and Hepper, 1999; Wormser, 2006) and male and female owners interact differently with their dogs (Prato-Previde et al., 2006), thus we decided to ask only women to participate in this study. The owners were asked to bring a female friend who acted as the familiar person in the tests. This person had to have regular contact with the owner, and at least bi-weekly contact of positive nature with the dog, but must not live in the same household. The persons playing the role of the unfamiliar woman had extensive experience in working with dogs. The unfamiliar person met the dog for the first time 20 min before starting the first test. In order to get familiar with the dog, she was allowed to stroke the dog and play with it in the presence of the owner during this period.

2.2. Test locations

Dogs were observed in eight behavioural tests organised into two sessions, and carried out on different days, with 1–6 weeks between the two occasions always in the same order. Four tests took place on the first day: (1) *Three-way strange situation test*, (2) *Call-in from food*, (3) *Obedience test*, and (4) *Walking away*.

The first two tests took place in a $3\text{ m} \times 5\text{ m}$ room in the university building, at a place which had never been visited by the dog before. The experimental room had three doors, leading in three different directions. Two cameras were located at the two sides of the room, opposite to each other. The *Obedience test* and the *Walking test* took place in open field next to the university building, which had not been visited by the dog earlier. An unfamiliar location was chosen to provoke more apparent reaction from the dog.

Tests on the second day were staged in open area which was familiar to the dog (e.g. in a park where the dog usually walked with its owner). Familiar location ensured that dogs would behave in a less controlled manner in the following tests: (5) *Threatening approach*, (6) *Playful interaction*, (7) *Food inhibition test* and (8) *Manipulation of the dog's body* (Table 1).

2.3. Procedure

2.3.1. Three-way strange situation test (3-way SST)

The test took place in the experimental room described above. Three chairs were in the middle of the room, each facing one of the doors and were separated from each other by an opaque panel with a height of 1 m. Three balls and three tug toys were also placed on the floor of the room.

The test consisted of 6 short episodes. At the beginning all participants (owner, familiar person, and unfamiliar person) entered the room through the same door. The owner was asked to cover the dog's eyes while entering the room with all the test partners at the same time through the same door chosen randomly for all dogs.

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