Applied Animal Behaviour Science 156 (2014) 62–69

Contents lists available at ScienceDirect

Applied Animal Behaviour Science

journal homepage: www.elsevier.com/locate/applanim

Effects of human contact and toys on the fear responses to humans of shelter-housed dogs

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ARTICLE INFO

Article history:
Accepted 20 March 2014
Available online 12 April 2014

Keywords:
Human interaction
Stress
Fear
Dog
Cortisol
Animal shelter

ABSTRACT

This study examined the effects of human contact and toys on fear responses to humans in small breed, shelter-housed dogs. Ninety dogs were assigned to one of three treatments: "control" (control), comprising routine husbandry performed by shelter staff; "human contact" (HC), where dogs additionally received 2 min positive contact daily with an experimenter; or "human contact + toys" (HCT), where the additional human contact included the opportunity to interact with toys. Treatments were implemented daily from day 2 (second day in the shelter) until day 6. On day 7, the fear response towards the experimenter was assessed using salivary cortisol concentrations and a human avoidance test. The behavioural parameters measured were approach and withdrawal responses to the experimenter and time spent in each section of the pen while the experimenter was situated at each of three positions outside the pen: 2 m (position 1) or 1 m away from the pen gate (position 2) or crouched against the pen gate (position 3). On day 8, dogs were assessed by the shelter veterinarian for their suitability for adoption by the public. Treatment had no effect on salivary cortisol concentrations or the proportion of dogs selected for adoption. The results indicated that dogs in the HC and HCT treatments spent more time ($P = 0.024$) at the front of the pen when the experimenter was at position 3 than control dogs (HC 8.8 s, HCT 8.7 s, control 6.6 s from a possible 10 s). For those dogs that were not at the front of the pen when the experimenter was in position 3, a higher ($P < 0.05$) percentage of HCT dogs (100%) but not HC dogs (86%, $P > 0.05$) approached the experimenter compared with control dogs (45%). A second experiment on another 40 dogs examined if dogs, based on their behaviour in the human avoidance test, discriminate between familiar and unfamiliar humans. All dogs received the HC protocol as in Experiment 1 and were observed in the human avoidance test, however, all dogs were tested twice, once with the 'familiar' experimenter and once with an 'unfamiliar' experimenter. There were no significant ($P > 0.05$) familiarity or testing order effects, except that dogs approached the unfamiliar experimenter more (60%) than the familiar experimenter (29%) at position 2 ($P < 0.05$). The results indicate that additional positive human contact other than that associated with routine husbandry reduced the behavioural fear response of dogs to humans, but did not affect the proportion of dogs selected for adoption. The results also indicate that the shelter dogs did not discriminate between familiar and unfamiliar humans, in the handling context used in this study, suggesting a degree of stimulus generalisation may occur.

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http://dx.doi.org/10.1016/j.applanim.2014.03.008
0168-1591/

1. Introduction

Fear can be considered as an undesirable emotional state of suffering that functions to protect the animal through defensive behaviour or escape and is elicited by the perception of actual or perceived danger (Toates, 1980; Jones and Waddington, 1992; Hemsworth and Coleman, 2011). The behavioural responses associated with fear include withdrawal, or avoidance responses, as well as immobility, such as freezing or crouching (Hemsworth and Barnett, 1987; Jones, 1987; Mills and Faure, 1990). The physiological responses associated with fear include responses of the sympatho-adrenal medullary system (e.g. secretions of adrenalin and noradrenalin) and the hypothalamo-pituitary adrenal system (HPA axis e.g. secretions of corticosteroid hormones, cortisol and corticosterone) (Hemsworth and Coleman, 2011).

In Victoria, the Code of Practice for the Management of Dogs and Cats in Shelters and Pounds requires that dogs are housed during the first 8 days in shelters in quarantine in individual pens with no tactile contact with other dogs. This requirement often results in dogs also having no visual contact with other dogs during this period. Standard operating procedures in other Australian states impose similar "quarantine" periods, ranging from 3 days to a week in animal shelters.

Surprisingly little research has been conducted on stress in shelter-housed dogs. Animal shelters are a stressful environment for dogs, possibly because of the novel surroundings, social restrictions and reduced human contact. Dogs have increased cortisol concentrations during the first 3 days in an animal shelter, declining slowly before reaching a plateau around day 9–10 (Hennessy et al., 1997). Even so, the authors reported that this plateau was above the average basal cortisol levels found in domestic dogs. An initial stress response can prepare an animal to adapt to a change in its environment; however, a longer-term activation of the stress response can lead to behavioural and physiological disturbances such as stereotypies, prolonged elevation of corticosteroids and immunosuppression (Johnson et al., 1992; Broom and Johnson, 1993), with welfare implications. Dogs are social animals, needing contact with both conspecifics (Fox, 1965; Fox and Stelzner, 1967) and, in dogs socialised to humans, contact with humans (Freedman et al., 1961; Wolfe, 1990). In the presence of a human, kennelled dogs typically become more active and spend more time at the front of their cage, reducing the human–animal distance and facilitating interaction (Campbell et al., 1988; Hughes et al., 1989; Wells and Hepper, 2000). Surveys have found that people looking to adopt a shelter dog prefer dogs located at the front of the cage rather than at the back, and dogs that are alert rather than non-alert (Wells and Hepper, 2000). The restricted human contact that typically occurs in shelters may increase fear of humans in shelter dogs and thus reduce their attractiveness to people looking to adopt a dog.

While the history of interactions between a human and a domesticated animal will affect the behavioural response of the animal to humans, it has been suggested that the behavioural response of farm animals to an individual human, through stimulus generalisation, can extend to other humans (Hemsworth and Coleman, 2011). Stimulus generalisation can be defined as a stimulus similar in nature to an original stimulus that produces the same behavioural response in a learning situation (Reber, 1988) but there has been very little research conducted on stimulus generalisation in dogs housed at a shelter. Hubrecht (1993, 1995) examined stimulus generalisation in laboratory-housed beagles and found that as little as 30 s of human handling daily for 2 months resulted in the beagles displaying more approach to both familiar and unfamiliar humans.

Very little research has been conducted examining the effects of combining human contact with the opportunity to play in shelter dogs. The dog is one of few species to engage in interspecific play with humans (Russell, 1936). Introducing play into a shelter environment may be beneficial for socialisation and preparation for rehousing by providing appropriate dog–human relationships (Wells, 2004). The first experiment in this study examined the effects of daily human contact and the opportunity to interact with toys during the first week of housing in an animal shelter on the behaviour and welfare of small breed dogs. Furthermore, treatment effects on the percentage of dogs selected as suitable for adoption at the completion of the 8-day quarantine period was also examined.

A second experiment in this study examined whether the effects of human contact were specific to the human that provided the contact, or were generalised to other humans.

2. Materials and methods

2.1. Ethical approval of animal experimentation

The protocol and conduct of the study were approved by the University of Melbourne, Melbourne School of Land and Environment Animal Ethics Committee (Ethics # 0703341.1 and 0911103).

2.2. Animals and facilities

The study was conducted at a large animal shelter in Victoria, Australia receiving at least 20,000 dogs per year.

During the 8-day quarantine period, dogs at the shelter were individually housed in pens (approximately 1 m wide × 2.5 m long × 2.5 m high) consisting of a concrete floor with a raised bed at the back of the pen, solid walls and a wire mesh front gate. Dogs remained in their pens during the 8-day quarantine period and were visually isolated from all other dogs in the shelter. Routine care by shelter staff was restricted to morning cleaning, whereby dogs remained in their pens while the pens were hosed clean and food and water provided. Tactile contact with the dogs by the staff was rare.

2.3. Experiment 1

Ninety small breed dogs over a 7-week period were studied on admittance to the shelter. The dogs varied in age, sex and breed and their past human and housing experiences were unknown.