The assessment of dog welfare in the waiting room of a veterinary clinic

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Abstract

Veterinary visits are known to be stressful for many dogs. The aim of this study was to assess dog welfare in the waiting room of the veterinary clinic through a multi-modal, non-invasive approach. Forty-five dogs were each videoed for 3 min in the waiting room of a veterinary clinic where they went for a scheduled visit. The welfare of each dog was assessed using a thorough video analysis and two overall evaluations (low, medium and high stress); one performed by a veterinary behaviourist and one by the dog's owner. Two-thirds of dogs spent more than 20% of the time displaying at least one indicator of stress, and 53.3% showed four or more behavioural signs of stress. Assessments of stress by the behaviourist indicated that level of stress in the waiting room was high in 28.9% of cases. The agreement between owners' and behaviourist's overall evaluations was quite low. The behaviourist's evaluations were strongly correlated with the time spent by dogs showing signs of stress and moderately correlated with the number of displayed signs, whilst owners' evaluations were not closely correlated to those factors. Dogs rated as highly stressed by the behaviourist were more prone to display resistance (halting, refusing to budge) when moving from the waiting room to the consultation room. The results of this pilot study support the idea that the welfare of dogs in the veterinary waiting room is often impaired, and that owners are unable to accurately assess stress in their dogs in such situations.

Keywords: *animal welfare, behaviourist, dog, owner, stress, waiting room*

Introduction

Compared to farm and laboratory animals, fewer studies have been carried out in companion animal welfare (Yeates & Main 2011; Yeates 2012), so better data on canine welfare issues are needed (CAWC 2009). For instance, veterinary visits are stressful for many dogs (Mills *et al* 2006; Döring *et al* 2009), but little is known about time spent in the waiting room.

Behavioural parameters are of particular interest for assessing stress in pets as they are easily measurable and non-invasive (Beerda *et al* 1997, 1998). There is also potential value in overall assessments of animals' emotional states (Wemelsfelder *et al* 2001; Mills *et al* 2006). The use of multiple means to assess dog welfare is uncommon, and consistency between different methods is unknown.

This pilot study aimed to assess dog welfare in the waiting room of the veterinary clinic using a multi-modal approach including a behaviourist's evaluation, owners' evaluation, and a thorough observation of dog behaviour, using multiple means to assess the reliability of overall evaluations.

Materials and methods

Participants

The sample was composed of dog-owner dyads (n = 29) or triads (one dog and two owners; n = 16) recruited from a population of owners bringing their dogs for a scheduled visit to a veterinary clinic in Florence, Italy. None of the dogs had any known health problems.

Protocol

Each dog-owner dyad/triad entered the waiting room where no other animal or person was present, only an operator who stayed in a corner filming and did not interact with the dog.

Prior to the visit, owners were asked to sit and to keep their dog on a leash. Each dog was videoed for 3 min while the owner completed a questionnaire, thus limiting dog-owner interactions. This helped to achieve a level of standardisation and left dogs free to behave naturally.

The questionnaire (one per dyad or triad) included 29 items, mainly multiple-choice questions, divided into three sections: owner's data; dog data; and owner's perception of their dog's welfare.

Table 1   Behaviours analysed in dogs as possible signs of stress and relative references.

Behaviour	References
Urination and/or defaecation	Beerda *et al* (1998, 1999); Tod *et al* (2005)
Crying (yelp, whining, whimper)	Beerda *et al* (1997); Schilder & van der Borg (2004); Rooney *et al* (2007, 2009)
Hypersalivation	Beerda *et al* (1997); Dreschel & Granger (2005)
Piloerection	Beerda *et al* (1999)
Trembling	Beerda *et al* (1999); Dreschel & Granger (2005); Tod *et al* (2005); Rooney *et al* (2009)
Panting	Beerda *et al* (1997, 1999); Schilder & van der Borg (2004); Dreschel & Granger (2005); Rooney *et al* (2009)
Paw lifting	Beerda *et al* (1997, 1998, 1999); Schilder & van der Borg (2004); Rooney *et al* (2007, 2009)
Turning around/circling	Beerda *et al* (1997, 1998, 1999); Schilder & van der Borg (2004); Dreschel & Granger (2005); Rooney *et al* (2007)
Excessive walking	Beerda *et al* (1997, 1998); Rooney *et al* (2007)
Autogrooming	Beerda *et al* (1998, 1999); Rooney *et al* (2007, 2009)
Crouching	Beerda *et al* (1997); Rooney *et al* (2009)
Lowered ears	Beerda *et al* (1999)
Lowered tail	Kotrschal *et al* (2009)
Shaking	Beerda *et al* (1999); Kotrschal *et al* (2009)
Attempting to hide	Lockwood (1995)
Attempting to exit the room	Beerda *et al* (1997)
Jumping on the owner	Kotrschal *et al* (2009)
Yawning	Beerda *et al* (1998); Schilder & van der Borg (2004); Dreschel & Granger (2005); Tod *et al* (2005); Rooney *et al* (2007); Kotrschal *et al* (2009)
Nose licking	Beerda *et al* (1997, 1998); Schilder & van der Borg (2004); Tod *et al* (2005); Rooney *et al* (2007, 2009)

Two people analysed the videos to record the occurrence and duration of 19 potential signs of acute stress in dogs (Table 1). Some dogs panted throughout the video possibly due to factors other than stress (eg temperature, excitement or breed), so panting was excluded from further analyses, for all dogs.

A veterinary behaviourist (recognised as an expert in animal behaviour by the FNOVI, Italian Federation of Veterinarian Classes) and each owner both provided an overall assessment of the dog's stress level: low, medium and high. No definition of such levels was provided.

Statistics

Owners' and behaviourist's overall assessements were compared using Cohen's Kappa coefficient; a Spearman's rank test was used to explore potential correlations between these evaluations and the duration and number of displayed signs of stress ($P < 0.05$).

A Spearman's rank test was also used to examine the relationship between owners' evaluations of dog stress in the veterinary waiting room and in everyday life ($P < 0.05$).

The Chi-squared test ($P < 0.05$) was used to investigate whether the expression (presence/absence) of a specific behaviour in the waiting room, the behaviour of the dog when entering the consultation room, and having been hospitalised/experienced painful conditions was related to the owners'/behaviourist's assessment.

Observational data were further analysed using Principal Component Analysis (PCA) with a varimax rotation.

Results

Participants were 45 adult dog owners (68.9% women) with 45 adult dogs (31 males and 14 females) aged 67.4 ($\pm$ 49.5) months, 14 mixed breeds and the rest belonging to various breeds. Small dogs ($\leq$ 10 kg) made up 46.7% of the sample, 28.9% were medium sized (11–20 kg), and 24.4% were large (> 20 kg).

Questionnaires

Most owners (75.6%) reported that their dogs were stressed in specific situations. Of the stress situations recorded using an open question, the most frequently reported were: the veterinary clinic (13.3%), strangers (11.1%) and thunderstorms (8.9%). When asked directly, in a closed question, whether their dog was stressed at the veterinary clinic, 60.0% of interviewees answered in the affirmative.

In the owners' opinion, 57.8% of dogs were aware they were going to the veterinary clinic before they arrived. Of those dogs (n = 26), some were reported to have shown signs of anticipation before leaving the home (3.8%), while walking to the clinic (57.7%), in the car (11.5%; only 1/3 showed travel-related problems in other situations), and outside the clinic (26.9%).

When moving from the waiting to the consulting room, around one-half of owners reported that their dogs were in a positive/neutral mood (40.0% calm and 6.7% happy) and the other half in a negative mood (26.7% halting and 20.0% refused to budge).

Owners reported that the stress level in the waiting room was 'low' in 44.4% of dogs, 'medium' in 26.6%, and 'high' in 28.9%.

Concerning everyday life, 51.1% of owners reported that their dogs were rarely stressed, 31.1% only in specific situations, and 17.7% often.
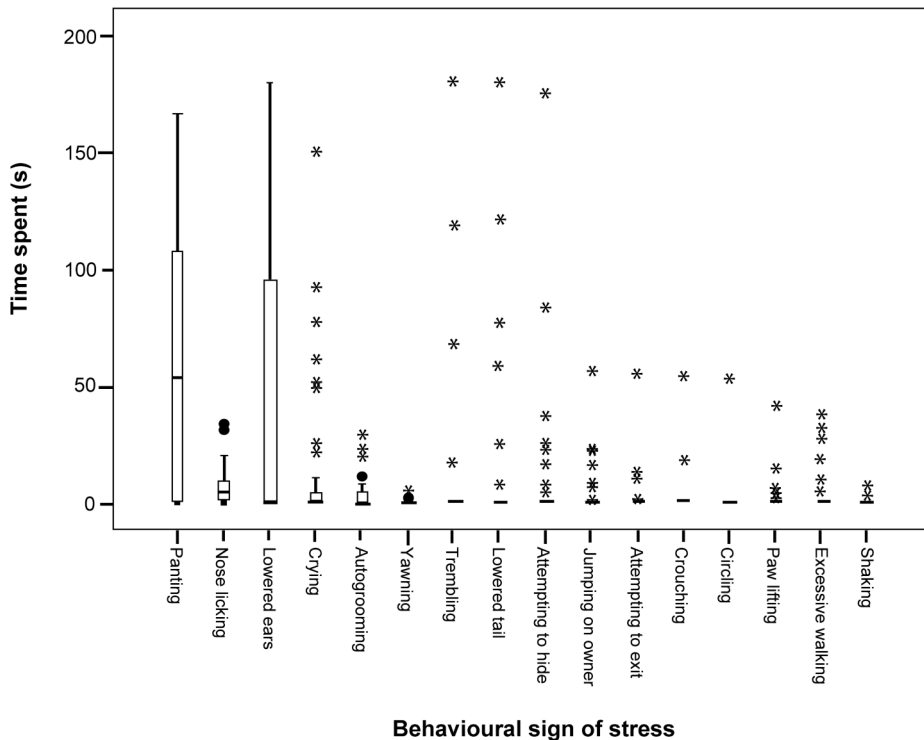
Few dogs had experienced painful conditions (6.7%), had been hospitalised (4.4%), or both (11.1%).

Figure 1
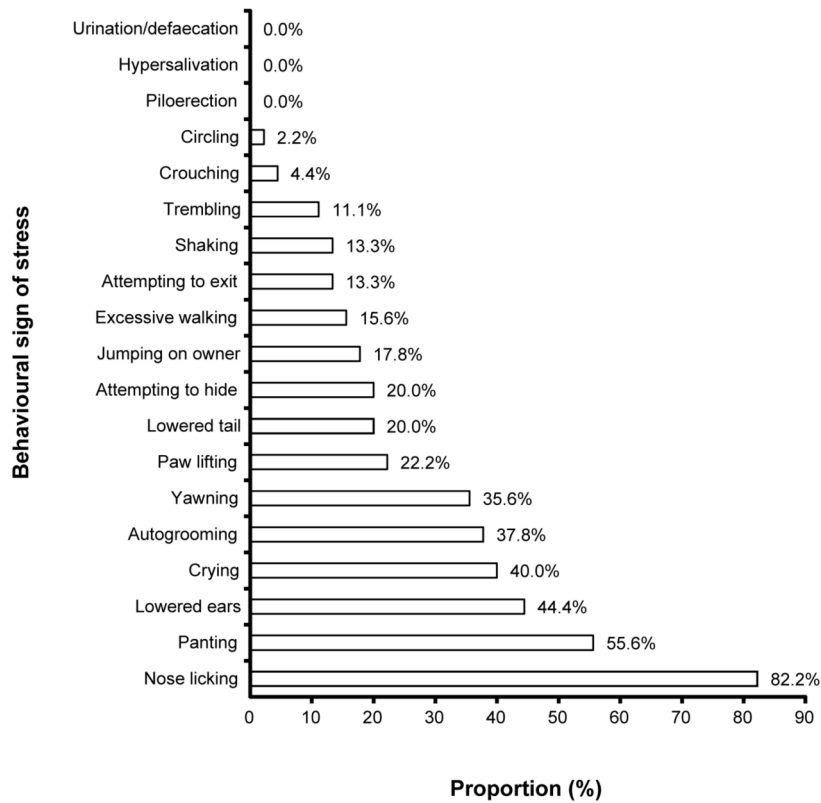
Proportion of dogs displaying the analysed behavioural signs of stress according to the video observation.

Figure 2

Time spent (s) by dogs displaying each analysed behaviour (for each box the bottom and top horizontal lines represent the lowest and highest values, the lowest and top edge of the box represent the lower and upper quartile, the horizontal line within the box represents the median, the small circles represent the outliers, and the asterisks represent the extreme outliers).

Table 2   Results of the Principal Component Analysis carried out on the observed behaviours. A behaviour was included in a component when the loading on that component was at least 0.650 and loading on the other components was lower than 0.500.

Observed behaviour	Components				
	1	2	3	4	5
Attempting to hide	0.937[1]	0.092	−0.008	0.082	0.007
Crouching	0.858[1]	0.108	0.092	0.001	−0.142
Autogrooming	0.726[1]	−0.137	−0.037	−0.067	0.175
Trembling	0.321	0.888[2]	0.061	−0.035	0.057
Yawning	−0.013	0.828[2]	−0.110	−0.203	0.189
Lowered tail	0.214	0.732[2]	0.487	−0.035	−0.103
Crying	−0.221	0.602[2]	−0.029	0.080	−0.201
Attempting to exit	−0.128	0.118	0.737[3]	0.008	−0.263
Jumping on owner	0.059	−0.094	0.751[3]	0.047	0.102
Lowered ears	0.030	0.107	0.691[3]	−0.096	0.129
Excessive walking	−0.052	−0.060	−0.112	0.889[4]	−0.131
Shaking	0.118	−0.122	0.104	0.761[4]	0.446
Nose licking	0.397	0.047	0.151	−0.078	0.683[5]
Circling	−0.157	−0.037	−0.064	0.100	0.618[5]
Paw lifting	0.157	−0.192	−0.063	0.039	0.031

[1] First component extracted through the PCA;
[2] Second component;
[3] Third component;
[4] Fourth component;
[5] Fifth component.

Videos

The inter-observer agreement was 0.817.

The proportion of dogs displaying each sign of stress is shown in Figure 1. Time spent displaying each behaviour is seen in Figure 2 (ordered by decreasing median); the minimum-maximum ranges and quartiles, besides the presence of outliers, shows a wide individual variability.

Two-thirds of dogs spent more than 20% of time displaying at least one sign, and 53.3% showed four or more different signs (other than panting).

According to the behaviourist, the stress level was 'low' in 42.2% of dogs, 'medium' in 28.9%, and 'high' in 28.9%.

Statistical analysis

Although the owners and the behaviourist provided similar proportions for their overall evaluations, the level of agreement between them was quite low ($K = 0.250$; $P = 0.019$).

The behaviourist's evaluations were strongly positively correlated with the time dogs spent displaying stress ($\varrho = 0.685$; $P < 0.001$), and moderately correlated with the number of displayed signs ($\varrho = 0.506$; $P < 0.001$). Owners' evaluations were not closely correlated with such factors

(for the number of signs: $\varrho = 0.421$; $P = 0.004$; for the duration: $\varrho = 0.312$; $P = 0.037$).

The behaviourist was more likely to assign a high level of stress to dogs showing trembling (high, medium, low: 38.5, 0.0, 0.0%, respectively; $\chi^2 = 13.846$; $P = 0.001$), lowered ears (76.9, 30.8, 31.6%, respectively; $\chi^2 = 7.812$; $P = 0.020$), lowered tail (53.8, 15.4, 0.0%, respectively; $\chi^2 = 14.231$; $P = 0.001$), attempting to hide (46.2, 15.4, 5.3%, respectively; $\chi^2 = 8.310$; $P = 0.016$), and attempting to exit the room (38.5, 7.7, 0.0%, respectively; $\chi^2 = 10.385$; $P = 0.006$). Owners were more likely to give a high stress rating when dogs attempted to hide (46.2, 25.0, 0.0%, respectively; $\chi^2 = 10.745$; $P = 0.005$) or to exit (30.8, 16.7, 0.0%, respectively; $\chi^2 = 6.612$; $P = 0.037$).

A PCA was applied to data from the observation of videos (Keiser-Meyer-Olkin = 0.294; for Bartlett's test, $\chi^2 = 300.978$; $P < 0.001$). Five components were extracted (Table 2) and, according to the kind of behaviours grouped and to the stress scores presented by Overall (2013; p 761) and Boardman (2014), classed as: passive avoidance (16.050% of explained variance: attempting to hide, crouching and autogrooming); high anxiety (15.623%: trembling, yawning, lowered tail and

crying); active avoidance (11.908%: attempting to exit, jumping on owner and lowered ears); high arousal (9.075%: excessive walking and shaking); and medium anxiety (8.514%: nose licking and circling).

The dogs' stress level in the waiting room and the reported frequency of stress in everyday life were significantly, but not closely, correlated ($\varrho = 0.362$; $P = 0.014$).

Having been hospitalised and/or experienced painful conditions was not related to the behaviourist's (40.0 versus 25.7%; $\chi^2 = 0.234$; $P = 0.629$) or owners' assessments (23.1 versus 21.1%; $\chi^2 = 0.095$; $P = 0.758$).

Dogs rated as highly stressed by the behaviourist were more prone to display resistance (halting, refusing to budge) when entering the consultation room (45.8 versus 8.5%; $\chi^2 = 5.529$; $P = 0.019$); this was not found for owners' assessments (29.2 versus 28.6%; $\chi^2 = 0.082$; $P = 0.775$).

Discussion

The welfare of dogs in the veterinary waiting room appeared impaired, with at least 1/4 dogs showing a high stress level. This proportion is similar to that found by Pierantoni *et al* (2010), using reports from owners, but smaller than found by Stanford (1981) through direct observation.

The way data are gathered is crucial, and the use of multiple measures can reduce the risk of under/overestimation. For instance, we found that the percentage of dogs reported to be stressed in the waiting room varied according to the manner in which owners were asked (open versus closed question).

There was also great divergence between owners' and the behaviourist's overall assessments of individual dogs. Owners are familiar with their dog's behaviour, suggesting that they may be more accurate in assessing stress in their dogs (Wojciechowska & Hewson 2005; Rooney *et al* 2009). For instance, owners may recognise subtle or individual-specific changes in behaviour, such as a reduction in the activity of a dog that is usually excitable, which would be difficult for someone unfamiliar with the dog to notice. Owners could also be helpful in assessing whether the tail and ears are lowered or not, which is sometimes difficult due to the high heterogeneity in domestic dogs' behaviour and morphology (Goodwin *et al* 1997). However, we found that owners were able to recognise more obvious signs of stress (as previously found in Mariti *et al* 2012b), such as those arising from the need to restrain the dog or prevent its escape; whilst the behaviourist considered both obvious and more subtle signs as indicative of stress. Moreover, owners may not be aware that canine behaviours can be ambiguous, expressing different inner states (eg stress or excitement) or due to various specific causes (eg autogrooming can be due to stress or to environmental contaminants). Veterinarians and behaviourists may be able to help owners by teaching them to look at the whole body language of the dog, and to properly assess (and possibly intervene in) dog welfare (Mariti *et al* 2012b). Moreover, if the assessments made by owners and behaviourists were integrated, this would provide more information and a better assessment.

The finding that the presence of certain behavioural signs influenced overall assessment is not inconsistent with the proportion of dogs displaying each sign: a dog could have shown a certain behaviour (eg nose licking) for only a short time or at the beginning, meaning that the dog was stressed but not necessarily at a high level. It is of note that the signs driving the behaviourist's assessment belonged to the three first principal components of PCA, ie those related to avoidance and high anxiety, whilst the signs of high arousal and medium anxiety were not regarded as signs of high stress. Interestingly, the number of dogs displaying lowered ears was higher than the number of dogs evaluated as highly stressed; perhaps a combination of lowered ears with other behaviours (as suggested by PCA) was necessary for the behaviourist to assess stress to be high.

Since an emotional state may be associated with various behaviours and individuals may have different behavioural styles, when the sample is small, overall judgments may be preferable (Mills *et al* 2006). In this study, the behaviourist's assessment seemed to be influenced by the time spent displaying stress, and to a lesser extent by the number of displayed signs. This suggests that this behaviourist had expertise in both knowing which behaviours may indicate stress and in quickly 'processing' an overall evaluation that is basically a summary of behavioural data (duration and occurrence of signs of stress). Owners seemed not to possess such skill.

Evidence of the reliability of behaviourists' assessments was provided by the association between a behaviourist's evaluation of high stress and subsequent difficulty getting the dog to move into the consulting room: a dog scared to enter the consultation room is probably stressed during the wait.

Due to the high individual variability (Beerda *et al* 1997; Horváth *et al* 2007) and to the low pathognomonicity (Haverbeke *et al* 2008) of canine behavioural signs of stress, duration of these behaviours can be more important than frequency. Detecting the response to a stressor is important, but assessing the time of recovery is even more important for its impact on dog welfare: some poor welfare states may be acceptable if they are of short duration, if the animal can tolerate them (Morton 2007), or if the animal recovers quickly; whereas a prolonged stress can be highly detrimental. Poor welfare in the waiting room is particularly important if the dog has to visit the veterinary clinic regularly, if it leads to travel-related problems (Mariti *et al* 2012a), or if dogs (as reported by many owners) anticipate going to the veterinarian, because they might develop an anxiety disorder (Overall 2013; p 60).

Although it would be desirable for every veterinary clinic to have a behavioural service, some basic functions could be performed by the staff. A behaviourist could teach the staff to 'screen' the dogs' behaviour in the waiting room and inform the veterinarian about the dog before the visit. A behaviourist could also provide veterinarians with a basic knowledge of dog ethology; veterinary surgeons have a duty to ensure their patients' welfare (Yeates 2012), so they should be able to correctly assess a dog's state, and they should also be able to perform a behavioural triage (Martin *et al* 2014).

Veterinarians should be aware that any dog, regardless of previous experiences or stress felt in other circumstances, can be stressed in the waiting room: factors such as a lack of familiarity with the place, the kind of handling, noises etc (and, in a real-life situations, conspecifics and strangers) can be stressful for some dogs. Veterinarians should also know how their own behaviour, facility etc can be made more dog-friendly (see eg Herron & Shreyer 2014), and they can advise owners on how to prevent and treat problems related to poor welfare (Gazzano *et al* 2008).

Hewson and colleagues (2007) reported that, so far, there has been little attempt to integrate proxy (owner and veterinarian) assessment with objective measures, although this integration would be beneficial: qualitative assessment can support quantitative assessment, particularly when behaviour requires a degree of interpretation, eg in welfare assessment (Walker *et al* 2009). While the present study lacked the standardisation (time of the day, dogs' activity before arriving) necessary for physiological measurements, such as cortisol, the use of overall, qualitative evaluations and behavioural, quantitative data (in this study) is an example of how these two approaches can be combined.

Animal welfare implications and conclusion

This pilot study is an example of a multi-modal, non-invasive approach to assessing dog welfare. The combined use of systematic observations and overall evaluations showed the potential that behaviourists might provide in assessing dog welfare.

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