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, so staying in the veterinary waiting room may be stressful too. This study was aimed at assessing dog welfare in the waiting room of the veterinary clinic through a multi-modal, non-invasive approach.

The sample was formed by 45 dogs, videoed for 3 minutes in the waiting room of a veterinary clinic where they went for scheduled visits. Their state of welfare was assessed through a thorough observation of videos and an overall evaluation (low, medium and high stress) done by a veterinarian behaviourist and the dog owner.

Two-thirds of dogs spent more than 20% of time displaying at least one sign of stress, and 53.3% of dogs showed 4 or more behavioural signs of stress. According to the behaviourist, the level of stress felt by dogs in the waiting room was high in 28.9% of cases. The agreement between owners' and behaviourist's overall evaluations was quite low. 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 such 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.

Results of this pilot study show that dog welfare in the veterinary waiting room is often impaired, and behaviourists should educate owners, veterinarians and their staff to properly assess dog welfare.

Key words: animal welfare, behaviourist, dog, holistic, stress, waiting room.

Introduction

Compared to farm and laboratory animals, fewer studies have investigated companion animal welfare (Yeates & Main 2011; Yeates 2012), so better data on canine welfare issues is 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 staying in the waiting room.

Behavioural parameters are of particular interest for assessing stress in pets, being easily and noninvasively measured (Beerda et al. 1997, 1998). And there is a growing recognition of the potential value of 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 not known yet.

This pilot study was aimed at assessing dog welfare in the veterinary waiting room clinic through 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 formed by dog-owner dyads (n=29) or triads (one dog and two owners: n=16) recruited among people bringing their dogs to a veterinary clinic in Florence (I) for scheduled visits. All dogs were healthy.

Protocol

Each dog-owner dyad/triad entered the waiting room where no other animal or person was present, except for an operator who stayed in a corner filming and without interacting with the dog.

Before the visit, owners were asked to sit and to keep the dog on the leash. Each dog was videoed for 3 minutes, while owners completed a questionnaire, thus limiting dog-owner interactions, so as to achieve a certain standardization and to leave dogs free to display their behaviours.

The questionnaire included 29 items, mainly multiple-choice questions, divided into 3 sections: owner's data, dog data and owner's perception of dog welfare.

Two people analysed the videos to measure 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 (e.g. temperature, excitement or breed), so panting was excluded from further analyses, for all dogs.

Moreover, a veterinarian behaviourist (recognized as expert in animal behaviour by FNOVI, Italian Federation of Veterinarian Classes) and each owner 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 evaluations were compared through Cohen's Kappa coefficient; their potential correlation with the duration and number of displayed signs of stress was assessed through Spearman rank test ($p<0.05$).

Owners' evaluations of dog stress in the veterinary waiting room and in everyday life were compared using the Spearman rank test ($p<0.05$).

The Chi-Square 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 hospitalized/experienced painful conditions was related to the owners'/behaviourist's assessment.

Observational data was further analysed through the Principal Component Analysis (PCA) with a varimax rotation.

Results

Participants were 45 adult dog owners (68.9% women) and 45 adult dogs (31 males and 14 females) aged 67.4±49.5 months, 14 mixed-breeds and the rest belonging to various breeds. Dogs were 46.7% small (≤10 kg), 28.9% medium (11-20 kg), and 24.4% large (>20 kg).

Questionnaires

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

In owners' opinion, 57.8% of dogs were aware they were to the veterinary clinic before arriving there. Among dogs who anticipated it (n=26), 57.7% showed stress while walking, 26.9% in front of the clinic, 11.5% in the car (only 1/3 showed travel-related problems in other circumstances), and 3.8% still at home.

When moving from the waiting to the consulting room, 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, in owners' opinion, 51.1% of dogs were stressed rarely, 31.1% only in specific situations, and 17.7% often.

Few dogs had experienced painful conditions (17.8%) and/or had been hospitalized (15.6%).

Videos

The intra-observer agreement was 0.817.

The proportion of dogs displaying each sign of stress is reported in figure 1. Time spent displaying each behaviour is shown in figure 2 (ordered by decreasing median), which highlights a wide individual variability

Two-thirds of dogs spent more than 20% of time displaying at least one sign, and 53.3% showed 4 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 analyses

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

Behaviourist's evaluations were positively, strongly correlated with the time spent by dogs displaying stress (ϱ=0.685; p=0.000), and moderately correlated with the number of displayed signs (ϱ=0.506; p=0.000). Owners' evaluations were not closely correlated to such factors (for the number of signs: ϱ=0.421, p=0.004; for the duration: ϱ=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%; X^2=13.846; p=0.001), lowered ears (76.9%, 30.8%, 31.6%; X^2=7.812; p=0.020), lowered tail (53.8%, 15.4%, 0.0%; X^2=14.231; p=0.001), attempting to hide (46.2%, 15.4%, 5.3%; X^2=8.310; p=0.016), and attempting to exit the room (38.5%, 7.7%, 0.0%; X^2=10.385; p=0.006). The owners were more likely to score a high stress when dogs attempted to hide (46.2%, 25.0%, 0.0%; X^2=10.745; p=0.005) and to exit (30.8%, 16.7%, 0.0%; X^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, X^2=300.978, p=0.000). Five components were extracted (table 2) and 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 low 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 not closely correlated (ϱ=0.362; p=0.014).

Having been hospitalized and/or experienced painful conditions was not related to the behaviourist's (40.0% *versus* 25.7%; X^2=0.234; p=0.629) and owners' assessments (23.1% *versus* 21.1%; X^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%; X^2=5.529; p=0.019); this was not found for owners' assessments (29.2% *versus* 28.6%; X^2=0.082; p=0.775).

Discussion

Dog welfare in the veterinary waiting room resulted often impaired, with at least 1/4 dogs showing a high stress level, in agreement with Pierantoni et al. (2010), as assessed through owners' reports, and less than what found by Stanford (1981) through direct observation.

The way data is gathered is crucial, and the use of multiple measures can reduce the risk of under/overestimation. For instance, we found a huge difference in the percentage of dogs reported to be stressed in the waiting room depending on how owners were asked.

A great divergence emerges also between owners' and the behaviourist's overall assessments of individual dogs. Owners are familiar with their dog's behaviour, suggesting that they may be accurate in assessing stress in their dogs (Wojciechowska & Hewson 2005; Rooney et al. 2009). For instance, owners may recognise changes in the behaviour, such as a low activity in a dog that is usually aroused, which is difficult to determine by somebody who does not have an acquaintance with that specific dog. 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 only noticeable signs of stress (Mariti et al. 2012b), probably those which they have to attend to, by holding the dog; 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 (e.g. stress or excitement) or due to specific causes (e.g. autogrooming can be due to stress or to environmental contaminants). Veterinarians and behaviourists should teach owners 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, owners' and behaviourist's assessments should be integrated in order to get more information and provide a better assessment.

Results on signs determinants of overall assessments are not in contrast with their relative frequencies: a dog can show a certain behaviour (e.g. nose licking) only for a short time or at the beginning, meaning that the dog is stressed but not necessarily at a high level. It is worthy noticing that the signs driving the behaviourist's assessment belonged to the three first principal components, i.e. those related to avoidance and high anxiety, whilst the signs of high arousal and low anxiety were not regarded as signs of high stress. Interestingly, the frequency of lowered ears was higher than the number of dogs evaluated as highly stressed, but maybe only a combination with other behaviours (as suggested by PCA) was responsible for assessing a high level of stress.

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 their assessment, behaviourists seem to be driven by the time spent displaying stress, and partially by the number of displayed signs. This supports that a behaviourist has double expertise: a theoretical one, i.e. knowing which behaviours may indicate stress; and an applied one, i.e. quickly "processing" an overall evaluation that is basically a summary of behavioural data. Owners seem not to have such skill.

173 The reliability of behaviourist's assessments is increased by being related with the dogs' behaviour
174 when moving from the waiting to the consultation room: a dog scared to enter the consultation room
175 is probably stressed during the wait.
176 Due to the high individual variability (Beerda et al. 1997; Horváth et al. 2007) and to the low
177 pathognomonicity (Haverbeke et al. 2008) of canine behavioural signs of stress, the importance
178 given to their duration may be crucial. Detecting the response to a stressor is important, but
179 assessing the time of recovery is even more important for its impact on dog welfare: some poor
180 welfare states may be acceptable if they are short or if the animal can tolerate them (Morton 2007);
181 whereas a prolonged stress can be highly detrimental. Poor welfare in the waiting room is
182 particularly important if the dog has to visit the veterinary clinic regularly, if it leads to travel-
183 related problems (Mariti et al. 2012a), or if dogs (as reported by many owners) anticipate going to
184 the vet, because they might develop anxiety (Overall 2014).
185 Although it would be desirable for every veterinary clinic to have a behavioural service, some basic
186 functions could be performed by the staff. A behaviourist could teach the staff to "screen" the dogs'
187 behaviour in the waiting room and inform the veterinarian about the dog to be visited. A
188 behaviourist could also provide veterinarians with a basic knowledge on dog ethology: veterinary
189 surgeons have a duty to ensure their patient's welfare (Yeates 2012), so they should be able to
190 correctly assess a dog's state; and they should also be able to perform a behavioural triage (Martin
191 et al. 2014).
192 Veterinarians should be aware that any dog, regardless of previous experiences or stress felt in other
193 circumstances, can be stressed in the waiting room: factors such as a lack of familiarity with the
194 place, the kind of handling, noises etc. (and, in a real-life situations, conspecifics and strangers) can
195 be stressful for some dogs. Veterinarians should also know how their behaviour, facility etc. can
196 become dog friendly (see e.g. Herron & Shreyer 2014), and advice owners how to prevent and treat
197 problems related to poor welfare (Gazzano et al. 2008). For instance, owners could be provided

with leaflets about potential signs of stress, asked to fill in an "observational form", and given the opportunity to discuss this topic, increasing their knowledge and awareness of canine welfare.

This study was carried out in a real clinical setting, without deliberately exposing dogs to potentially stressful stimulus. Moreover, it was not too time- or money-consuming, making it a good example of how welfare assessment in pets could be easily monitored. However, this approach lacks the standardization (time of the day, dogs' activity before arriving) necessary for physiological measurements such as cortisol.

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, e.g. in welfare assessment (Walker et al. 2009).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 conclusions

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 how reliable behaviourists can be in assessing dog welfare and how important their help is for dog owners. Due to the high proportion of dogs feeling stress in the veterinary waiting room, it would be advisable to involve behaviourists in the education of owners, veterinarians and vet staff.

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295 **Fig. 1**: proportion of dogs displaying the analysed behavioural signs of stress according to the video
296 observation.
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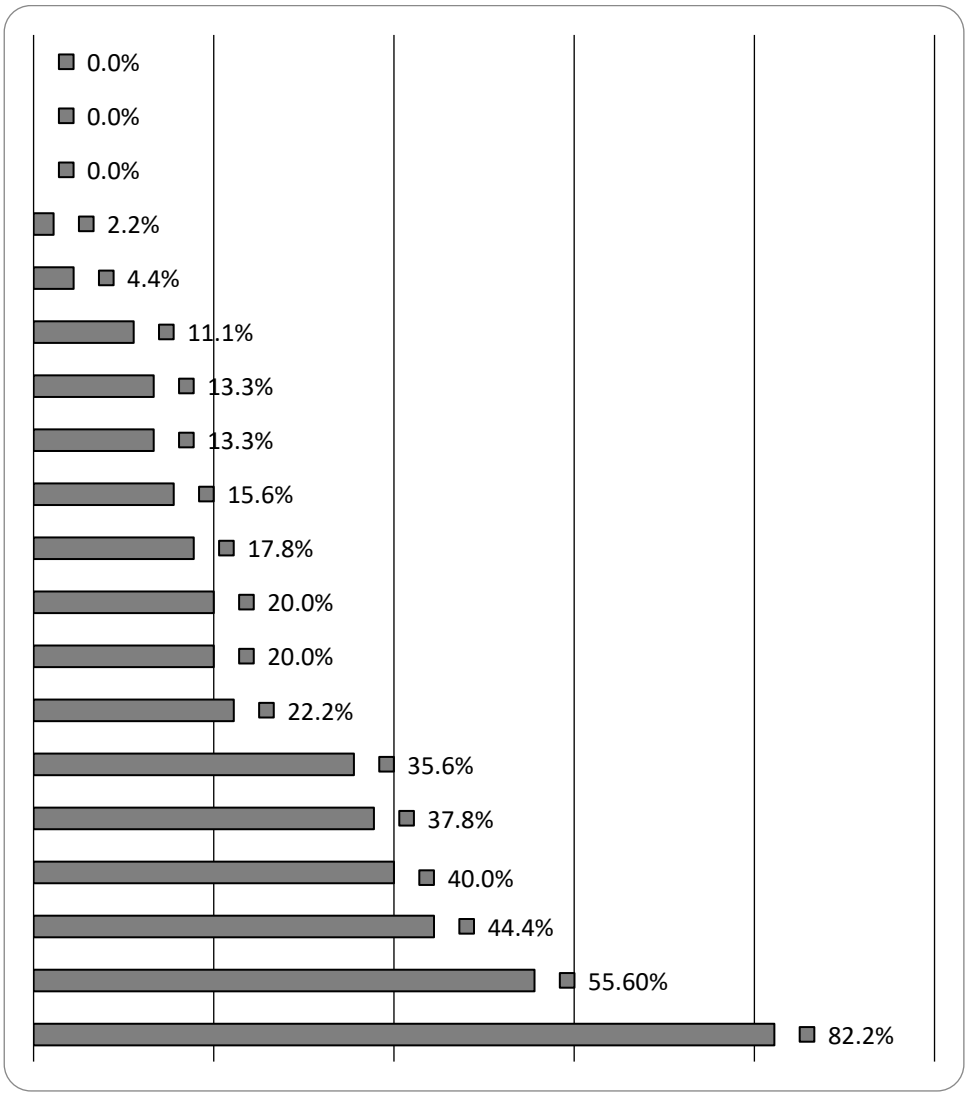

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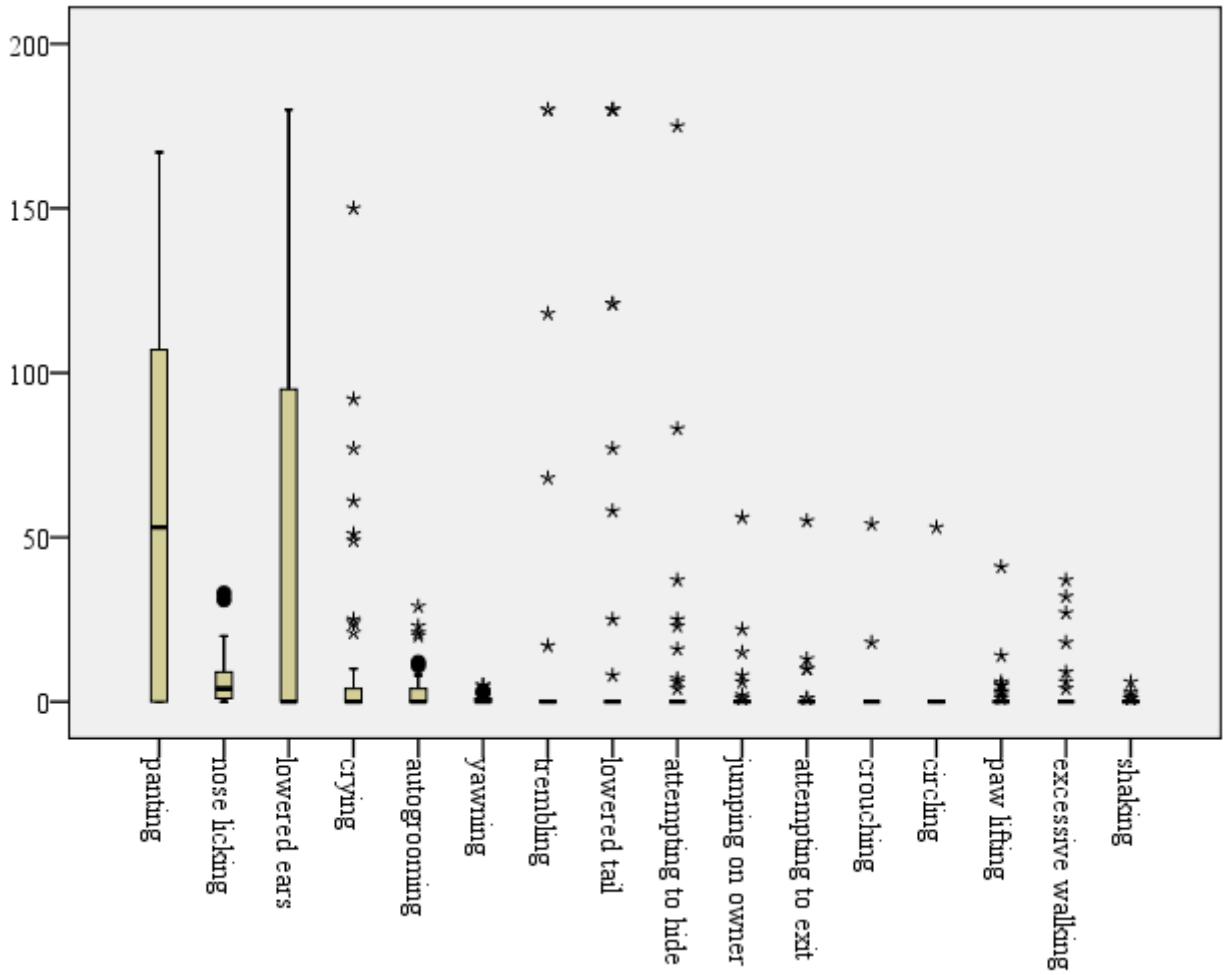
Fig. 2: time spent (in seconds) by dogs displaying each analysed behaviour (For each box the bottom and top horizontal lines represent the lowest and highest values, the lowest and top edge of the tinted box represent the lower and upper quartile, the horizontal line within the tinted box represents the median, the small circles represent the outliers, and the stars represent the extreme outliers).



307 **Tab. 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; Schildler & 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; Schildler & van der Borg 2004; Dreschel & Granger 2005; Rooney et al. 2009
Paw lifting	Beerda et al. 1997, 1998, 1999; Schildler & van der Borg 2004; Rooney et al. 2007, 2009
Turning around/circling	Beerda et al. 1997, 1998, 1999; Schildler & 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; Schildler & 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; Schildler & van der Borg, 2004; Tod et al. 2005; Rooney et al. 2007, 2009

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

313
314

	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

315
316 [1]= first component extracted through the PCA; [2]= second component; [3]= third component; [4]= fourth
317 component; [5]= fifth component.
318