



Behaviors expressed by whippets and Italian greyhounds when in two positive emotional states, as perceived by Italian caretakers

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Abstract: Given the importance of scientifically investigating signs of good welfare and positive emotional states in dogs, the present pilot study aimed to investigate behaviors expressed by whippets and Italian greyhounds when in two positive emotional states, as perceived by their caretakers. A dedicated questionnaire was developed and uploaded on a digital platform after pre-testing. The questionnaire included a section asking whether the respondents thought that there any postures or expressions signaling when their dogs were “happy and excited” or “happy and relaxed”. In case of a positive answer, respondents were asked how often their dog showed 13 behaviors (e.g., tail wagging, running up and forth, bowing, spinning, jumping on the caretaker) when in each of the two positive emotional states, and whether there were other possible behavioral signs of those two states. The survey yielded answers for 329 dogs (165 whippets, 162 Italian greyhounds, two whippet mixes) given by a convenience sample of 266 respondents. Among the tested 13 behaviors, the only one reported to happen at least often in more than 90% of the dogs was tail wagging when “happy and excited”. Most of the investigated behaviors were expressed more often when the dog was “happy and excited” than when “happy and relaxed” (e.g., tail wagging, spinning), and some were expressed with a different frequency in the two breeds (e.g., Italian greyhounds bowed more often than whippets when “happy and excited”). It is concluded that further studies are needed to identify possible behavioral correlates of different positive emotional states in different types/breeds of dogs.

Key Words: positive welfare, sighthounds, tail-wagging, arousal, individual differences.

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Introduction

The welfare of animals is important from both a scientific and an ethical point of view. Therefore much research has been devoted to it. However, up to now, such research has focussed more on signs of a negative welfare status than on those of a positive one, although the importance of the latter has been widely recognized (Boissy et al., 2007; Csoltova & Mehinagic, 2020; Mellor & Beausoleil, 2015). The aforementioned general trend can be found also concerning an intensively researched upon species, such as the domestic dog (*Canis familiaris*), (Csoltova & Mehinagic, 2020). Most studies have investigated indicators of compromised dogs' welfare (e.g., Beerda et al., 1997, 1998, 2000; Rooney et al., 2007; Mariti & Bein, 2015; Mariti et al., 2015), whereas few have tried to investigate correlates of good welfare and positive emotional states (e.g., Gyax et al., 2015; for a review, please see Csoltova & Mehinagic, 2020). One of the problems of the study of emotions in animals is the low specificity of the behaviors, and the dog is no exception in this regard, most canine behaviors having been found to have multiple meaning depending on the context (Csoltova & Mehinagic, 2020; Rehn & Keeling, 2011; Westerback, 2011). The dog,

however, also presents a further, more specific problem: the great variety of breeds, differing not only in morphology but also in behavior (e.g., Goodwin et al, 1997; Turcsán et al., 2011). In this regard, a group of breeds that have received clinical and scientific attention mainly due to their (perceived) differences from other dogs is that of the sighthound (e.g., Wagner & Ruf, 2019). Although the FCI (Federation Cynologique Internationale) and KC (Kennel Club) recognized sighthound breeds were codified mainly in the 19th century, sighthounds are considered ancient breeds because depictions of sighthound-like dogs can be found as far as 6000 BC (Bartel et al., 2007). Sighthounds have been selected to hunt by sight and chase their prey relying on their speed (Bartel et al., 2007). They are known to differ both physiologically (e.g., Mesa-Sánchez et al., 2016; Zaldívar-López et al., 2011) and, to some extent, behavior-wise (Elliot et al., 2010; Normando et al., 2021), from other breeds, although most of the studies have been done on specific subpopulations of sighthounds, such as rescued ex-racer greyhounds (Elliot et al., 2010; Thomas et al., 2017; Zaldívar-López et al., 2011).

Hence, this explorative pilot study aimed to investigate behaviors expressed by two genetically near (Parker et al., 2017) sighthound breeds, whippets, and (miniature) Italian greyhounds, when in two positive emotional states, differing in arousal level, as perceived by their caretakers. Our hypotheses were that:

1. some of the listed behavior was going to be reported as happening “always” in the vast (i.e., 90%) majority of the dogs in the specified positive state, thus being a promising candidate to being a behavioral correlate of that positive emotional state;
2. the frequency of expression of most of the listed behaviors would be different between the two states, thus highlighting the importance of the arousal component;
3. there would be differences in the frequency of expression of at least some of the listed behaviors in the specified emotional state between the two breeds, morphologic and genetic similarity notwithstanding.

Materials and methods

Survey

The results detailed in the present paper are part of a larger survey on the behavior of the smaller two of the sighthounds breeds: whippets and (miniature) Italian greyhounds (Contalbrigo et al., 2020). Based on the literature, the topic, and the authors' experience, a dedicated questionnaire was developed for the survey. The survey targeted whippets' and Italian greyhounds' caretakers, although the question about the breed of the dog also included “other, please specify”, for control reasons. Apart from dogs' and caretakers' demographics, the part of the survey presented here concerns possible behavioral correlates of positive emotional states in the dogs as perceived by their caretakers. In the first set of questions of that part, the respondents were asked whether they thought their whippet or Italian greyhound had any postures or expressions signaling when they were happy and excited. The possible answers were “yes”, “no”, or “I do not know”. If the respondent selected “yes”, then (s)he was asked how often his/her dog was showing each of 13 behaviors when “happy and excited”. The behaviors were (in the order they were asked): tail wagging, bowing by flexing the front legs, jumping on the respondent, eyes wide open, eyes half closed, spinning, rolling on the ground, running back and forth without any apparent goal (running crazy/aimlessly), smiling (lips relaxed and teeth showing), ears pricked/straightened, ears laid back, sighing, smiling (lips relaxed, but teeth not showing). The possible answers were “always”, “often”, “sometimes”, “rarely”, “never”, and “I do not know”. A further question asked whether the respondent thought that his/her dog had other postures or expressions signaling when the dog was happy and excited. In case of a positive answer, the respondent was asked to specify which. Also, the latter two questions were asked only to respondents having answered “yes” to their dog having behaviors signal-

ing that they were happy and excited. The second set of questions was identical to the first, but the situation it referred to was “happy and relaxed” instead of “happy and excited”. The decision to ask separately about the two emotionally positive states differing in arousal was done mainly on the basis of the literature finding different behavioral responses to stimulus maintaining the same emotionally positive valence, depending on the dog getting used to it (i.e., on decreased arousal; Gygas et al., 2015), and that owners could recognise the difference (Buckland et al., 2014). Given the preliminary and exploratory nature of the present study, the choice of the behaviors to be included was done partially based on the published literature (Buckland et al., 2014; Csoltova & Mehinagic, 2020) and partially based on the authors’ experience with sighthounds. For example, based on their experience, authors deemed running back and forth “as crazy” (aimlessly) was an example of locomotor play in this breeds. As play has been described in the literature as related to positive emotional states (Csoltova & Mehinagic, 2020) the behavior was included among those investigated.

Once pre-tested for clarity of the questions, the questionnaire was uploaded on the platform “Limesurvey” (LimeSurvey GmbH, Hamburg, Germany) and tested for the functioning of the electronic version. The survey was then publicized via word of mouth, breed clubs, and social media (i.e., Facebook groups dedicated to whippets and Italian greyhounds), using a virtual snowball sample technique.

Data analysis

Descriptive statistics were done on how many dogs the caretaker answered that there were behavioral signs of the two positive emotional states, how many other behaviors were suggested, and how often dogs were reported as showing each behavior in each state.

In order to investigate differences between the two breeds in the number of dogs reported as showing each behavior in each situation with different frequency, three levels of frequency were created: always, often, and less than often (i.e., the sum of sometimes, rarely and never). Then the Freeman-Halton extension of Fisher’s exact test (Freeman & Halton; 1951; Soper, 2020) was used to assess possible differences between the two breeds.

Wilcoxon rank tests were run to investigate whether there were differences among the two states (i.e., “happy and excited” vs “happy and relaxed”) in how often the dogs were reported showing a specific behavior. In order to run the Wilcoxon rank tests on the reported frequency of the behaviors in the two states, the answers were converted into a numeric scale, from “never” = 1 to “always” = 5, whereas “I do not know” was considered a missing answer. For those behaviors differing in frequency between breeds in at least one of the two states, the statistical analysis was repeated also breed by breed.

Results and Discussion

The survey yielded viable answers for 329 dogs (165 whippets, 162 Italian greyhounds, one whippet x Italian greyhound and one whippet x greyhound) given by a convenience sample of 266 respondents (216 female, 49 male; mean age \pm SD = 45.5 \pm 11.0 years). For three dogs (two whippets and one Italian greyhound), the respondents failed to identify behaviors expressed by their dogs both when “happy and relaxed” and when “happy and excited” (i.e., they answered that there were no signs or that they did not know). The three cases were eliminated from the analyses. For two dogs the respondent answered that the dog showed behaviors signalling when he/she was “happy and relaxed” but not/they did not know when “happy and excited”. For 40 the reverse was true.

Among the tested 13 behaviors, none was reported as always happening in the specified emotional state in the vast majority of the dogs. However, tail wagging when “happy and excited” was reported as always happening at least in the majority (>50%) of the dogs, and as happening at least

often in more than the 90% of the dogs. Tail wagging was described by around 30% of caretakers as a sign of a “happy and excited” dog in Buckland et al. (2014), with another almost 25% indicating wagging fast as a sign of the state. An increase in tail wagging was found during palatable treat offering (Travain et al., 2016), when expecting a food treat (McGowan et al., 2014), and during reunion after separation from the caretaker (Rehn & Keeling, 2011) especially when vocal, but not tactile, interaction was enacted (Rehn et al., 2014).

The results in terms of the percentage of dogs reported as showing the behavior always, often or less than often, when in that particular positive state (“happy and relaxed” or “happy and excited”), are summarised in table 1. The percentage is calculated on the total number of dogs whose caretakers answered there were behavioral correlates of that state (i.e., 324 for “happy and excited”, 286 for “happy and relaxed”). Please note that the answers related to the two “longdogs” (i.e., crosses between two sighthound breeds) were only included in the overall columns of table 1, and then removed from any further analyses. Although “ears pricked” was one the most often described correlate of dogs being “happy and excited” in Buckland et al. (2014), in the present study almost half of the dogs, especially Italian greyhounds, were reported to show it less than often when “happy and excited”. This difference could be due to many factors, including differences in the method of the study (open questions in Buckland et al. (2014), closed questions with a frequency Likert scale in the present study), type of dog (any in Buckland et al. (2014), only two sighthound breeds in the present study) or language of the survey. Another often described behavior in in Buckland et al. (2014) was carrying the head high when “happy and excited”, but in present study it was reported (in the open question about the other behaviors the dog could show when “happy and excited”) only by one respondent.

As for our second hypothesis, there were significant differences between the two breeds, and they are reported in table 1.

Table 1. Percentage of dogs reported as always or often or less than often (i.e., never, rarely, sometimes) showing the listed behavior when in the specified positive emotional state. A stands for “always”; O for “often”; L for “less than often”, * marks behaviors differing between the two breeds at $p < 0.05$; ** at $p < 0.01$; *** at $p < 0.001$. When the sum of A+O+L is less than 100%, it is because of respondents selecting the answer “I do not know” for that behavior.

Happy and excited									
Sample	Italian Greyhound			Whippet			Overall		
Behavior	A	O	L	A	O	L	A	O	L
Bowing*	21.25	39.38	39.38	13.58	31.48	53.70	17.59	35.19	46.60
Ears back	15.00	32.50	48.75	16.67	32.10	49.38	16.05	32.41	48.77
Ears pricked*	11.88	35.63	49.38	16.67	45.68	35.19	14.20	40.74	42.28
Eyes half closed	6.25	27.50	60.00	6.79	22.22	64.20	6.48	24.69	62.35
Eyes wide open	11.88	24.38	54.38	16.67	30.25	48.15	14.81	27.16	50.93
Jumping on***	55.63	28.75	15.63	27.16	33.95	38.89	41.36	31.48	27.16
Rolling on the ground*	3.13	10.63	86.25	6.79	18.52	74.69	4.94	14.81	80.25
Running aimlessly	30.00	32.50	36.88	20.99	41.36	37.65	25.93	36.73	37.04
Sighing	1.88	15.63	76.25	4.32	12.35	82.10	3.09	13.89	79.32
Smiling (teeth not visible)	6.88	19.38	65.00	7.41	19.14	69.75	7.10	19.75	66.98
Smiling (teeth visible)**	3.75	21.88	68.13	7.41	10.49	77.16	5.56	16.36	72.53
Spinning*	5.00	11.88	82.50	1.85	22.84	74.69	3.70	17.28	78.40
Tail wagging*	68.13	28.13	3.75	58.64	29.63	10.49	63.27	29.01	7.10

Happy and relaxed									
Sample	Italian Greyhound			Whippet			Overall		
Behavior	A	O	L	A	O	L	A	O	L
Bowing*	6.90	46.21	46.90	8.63	30.22	60.43	8.04	38.11	53.50
Ears back	13.79	29.66	53.79	14.39	34.53	48.92	13.99	31.82	51.75
Ears pricked	5.52	20.69	70.34	6.47	25.90	67.63	5.94	23.08	69.23
Eyes half closed	12.41	35.86	47.59	11.51	41.73	43.88	12.59	38.46	45.45
Eyes wide open	4.14	17.24	71.03	4.32	15.11	76.98	4.20	16.08	74.13
Jumping on**	26.21	26.90	45.52	13.67	23.02	63.31	19.93	24.83	54.55
Rolling on the ground**	2.76	7.59	89.66	5.04	19.42	75.54	3.85	13.29	82.87
Running aimlessly	8.97	26.90	63.45	12.23	20.86	66.91	10.49	23.78	65.38
Sighing	4.14	26.21	68.28	5.04	24.46	69.06	4.55	25.87	68.18
Smiling (teeth not visible)	4.14	24.14	64.14	6.47	17.27	71.22	5.59	20.63	67.48
Smiling (teeth visible)	2.07	17.24	75.17	2.88	15.11	78.42	2.45	16.43	76.57
Spinning	2.07	8.28	88.97	3.60	12.95	82.73	2.80	10.49	86.01
Tail wagging	37.24	38.62	23.45	29.50	42.45	27.34	33.57	40.56	25.17

There were differences between the two states (i.e., “happy and relaxed” vs “happy and excited”) in how often the dogs were reported to show a behavior, as for our third hypothesis, and they are shown in table 2. Most of the investigated behaviors were expressed more often when the dog was “happy and excited” than when “happy and relaxed”.

Table 2. Differences in the frequency the dogs are reported as showing the behavior depending on the investigated situation (i.e., “happy and excited” versus “happy and relaxed”)

Behavior	Sample	Z	p	Direction of the difference
Bowing	Whippets + Italian Greyhounds	3.97	<0.001	excited>relaxed
	Whippets	2.15	0.032	excited>relaxed
	Italian Greyhounds	3.45	0.001	excited>relaxed
Ears back	Whippets + Italian Greyhounds	0.88	0.381	n. s.
	Whippets	6.47	<0.001	excited>relaxed
	Italian Greyhounds	5.77	<0.001	excited>relaxed
Ears pricked	Whippets + Italian Greyhounds	8.67	<0.001	excited>relaxed
	Whippets	6.47	<0.001	excited>relaxed
	Italian Greyhounds	5.77	<0.001	excited>relaxed
Eyes half closed	Whippets + Italian Greyhounds	5.63	<0.001	relaxed>excited
	Whippets + Italian Greyhounds	8.30	<0.001	excited>relaxed
	Whippets + Italian Greyhounds	9.83	<0.001	excited>relaxed
Jumping on	Whippets	6.77	<0.001	excited>relaxed
	Italian Greyhounds	7.14	<0.001	excited>relaxed
	Whippets + Italian Greyhounds	0.79	0.432	n. s.
Rolling on the ground	Whippets	0.96	0.338	n. s.
	Italian Greyhounds	0.07	0.943	n. s.
	Whippets + Italian Greyhounds	9.93	<0.001	excited>relaxed
Sighing	Whippets + Italian Greyhounds	5.58	<0.001	relaxed>excited
Smiling (teeth not visible)	Whippets + Italian Greyhounds	0.80	0.422	n. s.
	Whippets + Italian Greyhounds	2.99	0.003	excited>relaxed

	Whippets	1.44	0.151	n. s.
	Italian Greyhounds	2.74	0.006	excited>relaxed
Spinning	Whippets + Italian Greyhounds	5.07	<0.001	excited>relaxed
	Whippets	3.25	0.001	excited>relaxed
	Italian Greyhounds	3.90	<0.001	excited>relaxed
Tail wagging	Whippets + Italian Greyhounds	8.33	<0.001	excited>relaxed
	Whippets	6.15	<0.001	excited>relaxed
	Italian Greyhounds	5.65	<0.001	excited>relaxed

The majority of the respondents (229 for “happy and excited”; 222 for “happy and relaxed”) did not suggest other behavioral signs of the investigated positive emotional states. The most often suggested other behaviors in case of the dog being “happy and excited” were: vocalizations (e.g., barking, howling, whining), jumping (repeatedly) into the air, licking/kissing the caretaker, hugging the caretaker, carrying the tail high, taking a toy in the mouth and either running around or taking it to the caretaker, mouth wide open, wriggling one’s butt, touching the caretaker with a paw. The most often suggested other behaviors in case of the dog being “happy and relaxed” were: roaching (Figure 1, i.e., lying in a relaxed position on a soft surface on the back - or partially on the back, with the legs usually extended, often in the air), stretching, seeking contact, lying down in lateral recumbence. Overall more extra behaviors were suggested for “happy and excited” than for “happy and relaxed”, agreeing with the findings of Buckland et al. (2014), who found that “caretakers described happy and excited” states in more detail than “happy and relaxed” ones, suggesting the former may be less well understood or difficult to interpret.



Figure 1. A whippet “roaching” and “smiling” (teeth visible).

Conclusions

The present study is a first attempt at investigating possible behavioral correlates of positive emotional states in two sighthound breeds. However, no behavior appeared to be always shown by the vast majority (90%) of the dogs in any of the two investigated states, and only tail wagging when “happy and excited” was reported to happen at least often in more than the 90% of the dogs, suggesting great individual differences in the expression of positive emotional states in this species, at least in the perception of the caretakers. Differences between the two breeds and between “happy and excited” and “happy and relaxed” states were evident as well. Further studies are needed to identify possible behavioral correlates of different positive emotional states in different types/breeds of dogs.

Conflicts of interest

All authors report no conflicts of interest: none of the authors has any financial or personal relationships that could inappropriately influence or bias the paper’s content.

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Il comportamento di whippet e levrieri italiani percepito dai caretaker italiani in due stati emozionali positivi

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Sintesi

Data l'importanza di indagare scientificamente i possibili correlati comportamentali di stati emotivi positivi e di benessere positivo nel cane, col presente studio pilota ci si è prefissi di indagare i comportamenti che, secondo la percezione di chi si occupa di cani stessi, vengono espressi dai whippet e dai piccoli levrieri italiani in due stati emotivi positivi. Per l'indagine, è stato sviluppato un questionario *ad hoc*, che è stato caricato su una piattaforma digitale dopo i test preliminari. Nel questionario, una sezione chiedeva se, secondo gli intervistati, ci fossero posture o espressioni che segnalassero quando i loro cani erano "felici ed eccitati" o "felici e rilassati". In caso di risposta positiva, agli intervistati veniva chiesto quanto spesso il loro cane mostrasse 13 comportamenti (ad esempio, scodinzolare, correre avanti e indietro all'impazzata, inchinarsi, girare su se stesso, saltare addosso) quando si trovava in ciascuno dei due stati emotivi positivi, e se ci fossero altri possibili segnali comportamentali di questi due stati. Il sondaggio ha ottenuto risposte per 329 cani (165 whippet, 162 levrieri italiani, due mix whippet) fornite da un campione di convenienza di 266 intervistati. Tra i 13 comportamenti indagati, l'unico che è stato segnalato accadere almeno "spesso" in più del 90% dei cani è stato scodinzolare quando "felice ed eccitato". La maggior parte dei comportamenti proposti sono stati riportati accadere più spesso quando il cane è "felice ed eccitato" che quando è "felice e rilassato" (ad esempio, scodinzolare, girare), e alcuni sono riportati con una frequenza diversa nelle due razze (ad esempio, i piccoli levrieri italiani si inchinano più spesso dei whippet quando sono "felici ed eccitati"). Si conclude che sono necessari ulteriori studi per identificare possibili correlati comportamentali di diversi stati emotivi positivi in diversi tipi/razze di cani.

