The importance of welfare and temperament on the performance of police dog

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Abstract: Stressful conditions influence a lot police dogs' life and they can compromise the welfare and the labour efficiency of them. In order to ameliorate the work and life style of these subjects, it is necessary to use an interdisciplinary approach considering individual temperament, dyadic relationship, behavior and hormonal parameters. The aim of this study was to evaluate all these aspects in a K-9 unit of 8 Labrador and their handler. Handlers answered an informative questionnaire and a standard questionnaire (C-Barq) about their companions. For each dog, two training sessions were videotaped and reviewed, to evaluate their performance and the presence of stress signals with and without the handlers. Faeces and hair were collected to analyse cortisol levels using RIA. It was performed a statistical analysis to underline the difference between the two performance and the possible correlation between performance and C-Barq scores. The results showed that, during their performance, dogs did not show stress signals. C-Barq indicated that all the dogs have in common a high level of trainability and the statistical analysis evidenced that the traits "Dog-directed fear" and "Attachment/attention-seeking" influence negatively the performance of the dog with their handlers. Hormonal analysis evidenced physiologic values of hair cortisol, whereas its faecal concentration varied between the dogs, influenced by the activity of the subjects in the previous days and by the presence of intestinal pathologies. According to our results, the dogs of the K-9 unit considered present a good level of welfare, and this condition influence positively their performance. The quality of the relationship with their handler and conspecifics, the experience and the temperament of each subjects can affect a lot their work. Therefore, it is important to consider all these aspects and to know the life style and the history of each subjects, in order to ameliorate their welfare and, consequently, their performance.

Key Words: police dogs; dog welfare; dog performance.

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Introduction

Police dogs undergo everyday stressful situations that can influence their welfare and performance during their training and work. Stress is an adaptive response to physical and/or psycho-logical demands. It can be distinguished in a positive, physiological and gradual stress, that stimulates the animal to reach better results ("eustress"), or in a negative intense and/or prolonged stress, which causes a reduction of the well-being of an individual (Morberg, 2000; Möstle & Palme, 2002). The monitoring of the stress can be done using hormonal parameters, such as cortisol, and behavior and it is commonly used in the study of animal welfare (Mormède et al., 2007).

The individual temperament, the dyadic relationship between dogs and their handlers, and the life style of each individual are important aspects that influence the work and the welfare of police dogs (Lefebvre et al., 2007; Haverbeke et al., 2008). The aim of the study was to analyse all these aspects and evaluate the performance and the welfare in a group of dogs belonged to a K-9 unit (explosives detection).

Materials and methods

The study was conducted in a K-9 unit composed of 8 Labrador and their handlers. To get information about the life style and the temperament of each dog, it was asked to the handlers to complete an informative questionnaire and a standard questionnaire (C-Barq- Canine Behavioral Assessment and Research Questionnaire) about their companions. All the dogs performed two training sessions (one with and one without its own handler), which were videotaped and reviewed, to evaluate their performance and the presence or not of stress signals. The percentage of correct exercises, errors and repeated exercises were calculated. Faeces and hair were collect-ed to analyse cortisol levels. After the hormonal extraction from both matrices (Shatz & Palme, 2001; Accorsi et al., 2008), the hormonal determination was conducted using RIA according to the technique described by Tamanini et al. (1983). Finally, it was performed non-parametric statistical tests to evidence the difference between the performance with and without their own handler (Man-Withney test), and the possible correlation between performance and C-Barq results (Pearson test).

Results

Using the informative questionnaire, we have evaluated the life style of dogs: any subject, except one, present behavioral problems; four subjects suffer of gastrointestinal problems and all the handlers spend some time extra-work almost every day with their companions.

During their performance, dogs did not show stress signals. Most of the dog performed better with their own handlers, even if the difference between the two performance was not significant (Fig. 1).

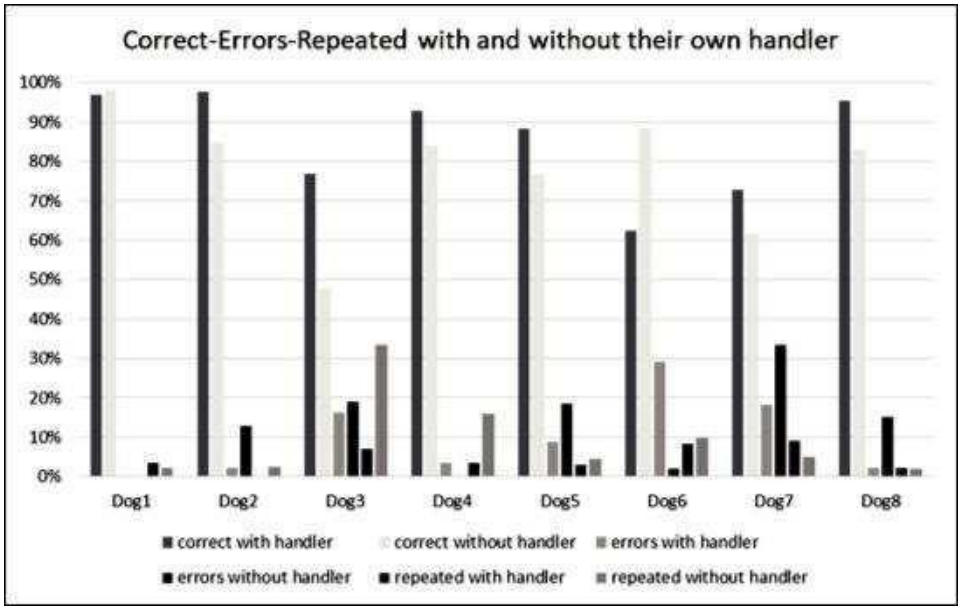

Figure 1. Performance of dogs with and without their handler.

The C-Barq results showed that all the dogs have in common a high level of trainability and low levels of stranger-directed fear (Fig. 2).

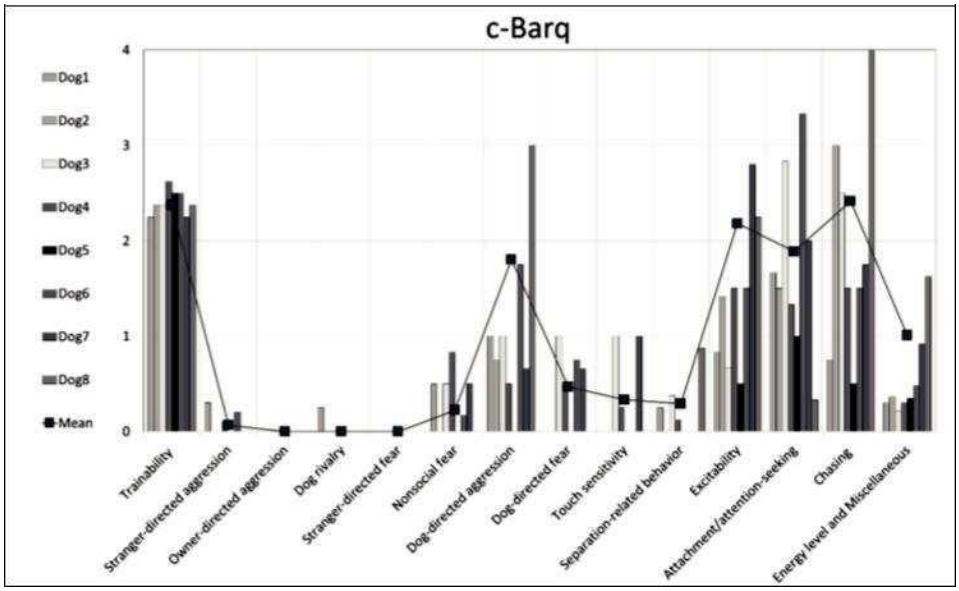

Figure 2. Mean results of dogs in each C-Barq sections.

Pearson test allowed us to explore the statistical significance correlation between the categories of C-Barq and the performance with or without the trainer (Tab. 1).

Table 1. Correlation between performance with and without the handler and C-Barq results, with r and p values.

		Stranger-directed aggression	Dog-directed fear	Touch sensitivity	Attachment/ attention-seeking
Correct with handler	Pearson Correlation	-0.032	**-0.803***	-0.468	**-0.810***
	Sig. (2-tailed)	0.940	**0.016**	0.243	**0.015**
Errors with handler	Pearson Correlation	0.017	**0.765***	0.391	**0.812***
	Sig. (2-tailed)	0.968	**0.027**	0.338	**0.014**
Repeated with handler	Pearson Correlation	0.117	**0.833***	0.658	**0.729***
	Sig. (2-tailed)	0.782	**0.010**	0.076	**0.040**
Correct without handler	Pearson Correlation	0.659	-0.659	**-0.893****	-0.302
	Sig. (2-tailed)	0.075	0.075	**0.003**	0.467
Errors without handler	Pearson Correlation	**-0.757***	0.176	0.655	-0.081
	Sig. (2-tailed)	**0.030**	0.678	0.078	0.849
Repeated without handler	Pearson Correlation	-0.166	**0.792***	0.623	0.537
	Sig. (2-tailed)	0.694	**0.019**	0.099	0.170

Hair cortisol level of all dogs was within the physiologic range (0.34–5.38 pg/mg, according to Corradini et al., 2013) (Fig. 3), whereas faecal cortisol concentrations were different among the subjects (Fig. 4).

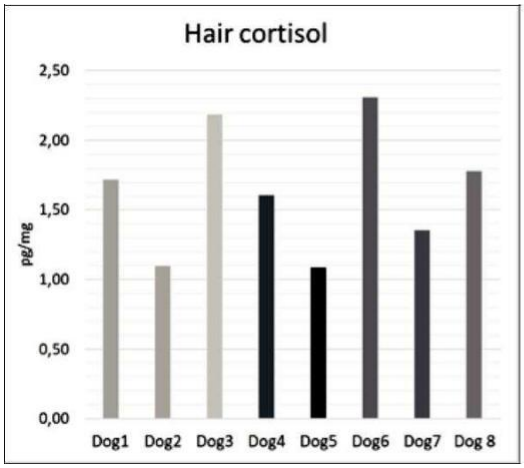

Figure 3. Hair cortisol levels of each dog.

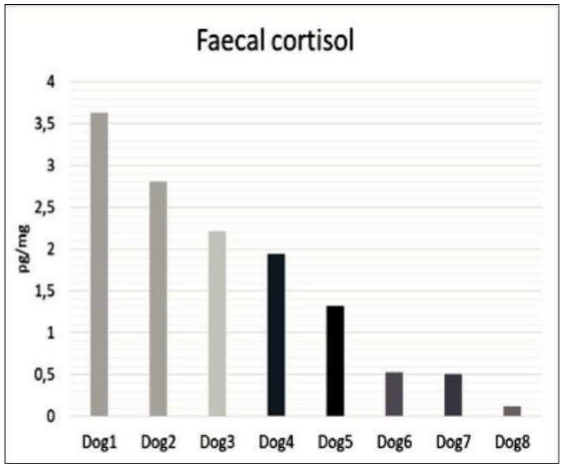

Figure 4. Concentrations of cortisol metabolites in faeces.

Discussion

The absence of stress signals during the training may indicate that they deal with work in a positive way. Physiologic hair cortisol level and the absence of behavioral problems, when the dogs do not work, except of one subject, suggests that the subjects do not suffer of chronic stress, and we can suppose that their welfare is respected. The three subjects that reported the highest results of faecal cortisol level are the same that were on duty the days before the sampling, those with the lowest are affected all by chronic intestinal problems. Therefore, probably, changes in gut micro-biota and the increased permeability and re-absorption of the gut may cause a lower secretion of faecal cortisol metabolites, because cortisol enterohepatic cycling and its metabolism into the gut (Palme et al., 2005). The use of food as reward may influence negatively the work of the dogs that suffer of this kind of problems.

All the handlers spend some time extra-work with their dogs and just some of them take at home their companions. Our results indicate that performance of the subjects is influenced a lot by the quality of the relationship with their handler (McConnell, 1990). Indeed, the C-Barq results underlined that an excess of dogs' attachment to their handler is negative for the work, whereas a good socialization of dogs with conspecifics can ameliorate their performance (Lefebvre et al., 2007).

Conclusions

To conclude, the experience of dogs and the quality of the relationship with their handlers and conspecifics influence positively the performance of dogs. To choose the reward, it is important consider the preference, but also the clinical history of each subject. The maintenance of a state of welfare of dogs guarantees good performance.

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Importanza del benessere e temperamento sulla performance del cane da polizia

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Sintesi

Le condizioni di stress influenzano notevolmente la vita del cane da polizia e possono comprometterne il benessere e le prestazioni.

Per migliorare il lavoro e lo stile di vita di questi soggetti, è necessario usare un approccio interdisciplinare considerando il temperamento individuale, la relazione diadica, i parametri ormonali e comportamentali.

Lo scopo di questa ricerca è stato quello di valutare tutti questi aspetti in una unita K9 di 8 Labrador e rispettivi conduttori.

I conduttori compilarono un questionario informativo ed un questionario standard (C-Barq) sui propri animali. Per ogni cane furono registrate ed analizzate due sessioni di training per valutare la performance e la presenza di segni di stress in presenza o meno dei rispettivi conduttori.

Le feci ed il pelo furono raccolti per determinare i livelli di cortisolo attraverso una metodica RIA. È stata effettuata un'analisi statistica per evidenziare la differenza tra le due performance e la possibile correlazione tra prestazione e punteggi del C-Barq.

I risultati hanno mostrato che, durante la loro performance, i cani non hanno emesso segnali di stress. Il C-Barq indica che tutti i cani hanno in comune un alto livello di addestrabilità e l'analisi statistica ha evidenziato che i tratti "Paura di altri cani" e "Attaccamento/ricerca di attenzioni" influenzano negativamente la prestazione del cane con il conduttore.

Le analisi ormonali hanno evidenziato valori fisiologici di cortisolo nel pelo, mentre le concentrazioni fecali variano tra i diversi cani, influenzate dall'attività dei soggetti nei giorni precedenti e dalla presenza di patologie intestinali.

Secondo i nostri risultati, i cani dell'unità K-9 p resi in considerazione, presentano un buon livello di welfare e questa condizione, influenza positivamente le loro prestazioni.

La qualità della relazione con i propri conduttori e conspecifici, l'esperienza ed il temperamento di ogni soggetto possono alterare profondamente la performance. È perciò importante considerare tutti questi aspetti e conoscere stile di vita e storia di ogni soggetto per migliorarne il benessere e conseguentemente la performance.