

Does music calm the dog?

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Abstract: Aim of the research has been evaluating the possibility to evoke a conditioned positive emotional response in dogs with separation problems by listening to music. For the present study 14 dogs, with symptoms referable to separation problems, were used.

All dogs were conditioned for 20 days to listen to, for 20 minutes, three times a day, a piece of music chosen by the owner, in a calm environment and in the presence of the owner.

After 4 days from the end of the conditioning period, each dog was subjected to 3 experimental tests consisting in being alone, for 5 minutes, in an unknown environment, different for each test, in silence or listening, for the duration of the experimental session, to the music chosen by the owner or a piece of classical music. The dog's behavior was filmed by a video camera positioned in the experimental room.

The data analysis of canine behavior in the test sessions revealed that the behavior "barking" is expressed statistically lower when the dog is listening to the music chosen by the owner with respect to classical music ($q = 2.27$; $p < 0.05$). Also the behavior "scratching the door" is lower expressed when the dog is listening to the music chosen by the owner with respect to classical music ($q = 2.74$; $p < 0.05$) and to the period of silence ($q = 2.36$; $p < 0.05$).

The results, given the small number of animals and the extreme individual variability, are still considered preliminary, but seem to demonstrate the possibility of conditioning the dog to a positive emotion such as that which arises when the animal is in a familiar environment and in presence of the owner.

Key Words: conditioned emotional response; dog; separation problems; music.

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Introduction

Stress is an inevitable event, often linked to the environmental variability in which the subject has to adapt (Broom, 1988). There are many situations in which the dog is a victim of stress signaling with behavioral changes well evident even to the owners (Mariti et al., 2012).

For many years, has been known the possibility to influence the emotions (conditioned emotional response, CER), especially negative ones, like fear, as the result of a classical conditioning: from the association of a relatively neutral stimulus with a painful or fear-inducing experience the formerly neutral stimulus elicits fear. For example, if seeing a dog (a neutral stimulus) is paired with the pain of being bitten by the dog (unconditioned stimulus), seeing a dog may become a conditioned stimulus that elicits fear (conditioned response).

In 1941 B.F. Skinner and W. Kaye Estes demonstrated the CER using electric shocks on rats (Domjan, 2015).

Also positive emotion can be conditioned and this process could be a useful method to maintain emotional homeostasis in environments normally stressful for the animal.

The conditioning of positive emotions could be also useful to get a behavior modification and a reduction of stress in dogs with separation problems. Dogs with separation problems show in fact

distressed responses to being left alone or being separated from the owner (Overall et al., 2001), engaging in a range of different behaviors; vocalization, destruction, elimination of urine or feces, anorexia, drooling, attempts to escape and (behavioral) depression (Horwitz, 2009). Vocalization, elimination and destruction are the most commonly reported behaviors (Overall et al., 2001; Sherman & Mills, 2008).

The aim of the research was to evaluate the possibility to evoke a conditioned positive emotional response in the dogs with separation problems by listening to music.

Subjects, materials and methods

For the present study 14 dogs, 9 females and 5 males, aged 9 months to 15 years (mean age 54.37 ± 40.96 months), of which 5 mongrels and 9 belonging to different breeds, were used. All the bitches were in the period of anoestrus. The animals showed symptoms referable to separation problems, diagnosed by a veterinary behaviorist.

All dogs were conditioned for 20 days to listen, for 20 minutes, three times a day, to a piece of music chosen by the owner, in a calm environment and in the presence of the owner.

After 4 days from the end of the conditioning period, each dog was subjected to 3 experimental tests consisting in being alone, for 5 minutes, in an unknown environment, different for each test, in silence or listening, for the duration of the experimental session, the music chosen by the owner or a never heard piece of classical music (J.S. Bach "Glenn Gould - Goldberg Variations"). The dog's behavior was filmed by a video camera positioned in the experimental room. The three tests were performed at 4 days apart from each other.

Behavioral observations were made on the basis of an ethogram reported in Table 1.

Table 1. Ethogram used for dog behavior evaluation.

Behavior	References
Autogrooming	Beerda et al., 1998, 1999; Rooney et al., 2007; Rooney et al., 2009
Barking	Beerda et al., 1997; Cannas et al., 2014
Door orientation	Mariti et al., 2013a; 2013b
Excessive barking	Beerda et al., 1998; Schildler & van der Borg, 2004; Rooney et al., 2009
Hypersalivation	Beerda et al., 1997; Dreschel & Granger, 2005
Low activity	Beerda et al., 1997, 1999
Nose licking	Beerda et al., 1997, 1998; Schildler & van der Borg, 2004; Rooney et al., 2009
Other repetitive activities	Beerda et al., 1997, 1999; Rooney et al., 2009
Panting	Beerda et al., 1997; 1999; Hennessy et al., 1998; 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; Rooney et al., 2009
Piloerection	Beerda et al., 1999
Self-scratching	Kotrschal et al., 2009
Door scratching	Beerda et al., 1999
Shaking	Beerda et al., 1999; Kotrschal et al., 2009
Tail between legs	Kotrschal et al., 2009
Turning around/circling	Beerda et al., 1998, 1999; Schildler & van der Borg, 2004; Rooney et al., 2007
Trembling	Beerda et al., 1999; Dreschel & Granger, 2005; Rooney et al., 2009
Turning head	Schildler & van der Borg, 2004; Rooney et al., 2007
Urination and / or defecation	Beerda et al. 1998, 1999
Yawning	Beerda et al., 1998; Hennessy et al., 1998; Dreschel & Granger, 2005
Whining	Mariti et al., 2013a; 2013b

The behaviors were expressed as total duration in seconds or frequency in 5 minutes. For statistical analysis of the data, the Friedman and the Dunnett test were used.

Results

The data analysis of canine behavior in the test sessions revealed a statistically significant difference only for the behaviors of “barking” ($\chi = 9.18$; $p < 0.05$) and “scratching the door” ($\chi = 11.23$; $p < 0.05$). The data of the two behaviors are shown in Table 2.

Table 2. Average values (\pm S.D.) of “Barking” and “Door scratching” during the different test situations.

	Barking (s) Mean \pm S.D.	Door scratching (s) Mean \pm S.D.
Owner music	2.28 \pm 3.07	7.71 \pm 12.71
Classic music	15.00 \pm 24.06	22.36 \pm 30.36
Silence	6.43 \pm 10.00	19.28 \pm 18.22

The behavior “barking” was expressed statistically lower when the dog was listening to the music chosen by the owner with respect to classical music ($q = 2.27$; $p < 0.05$).

The behavior “scratching the door” was expressed statistically lower when the dog was listening to the music chosen by the owner with respect to classical music ($q = 2.74$; $p < 0.05$) and to the period of silence ($q = 2.36$; $p < 0.05$).

Discussion

The calming effect of music on animals has been shown by numerous studies (Wells et al., 2002; Wells et al., 2006; Wells et al., 2008; De Jonge et al., 2008; Kogan et al., 2012; Howell et al., 2003) carried out on different species.

This research shows the data of the first experimental evidence of induction of a positive emotional response in dogs after listening to music.

The results, given the small number of animals and the extreme individual variability, are still considered preliminary, but appear to demonstrate the ability to condition the dog to a positive emotion such as that which arises when the animal is in a familiar environment and in presence of the owner. We should not forget, in fact, the importance of the attachment bond between dog and owner (Mariti et al., 2013a) to maintain its emotional homeostasis. The attachment figure is an important stabilizing factor for the dog that is able to create a strong attachment bond with the owner, as demonstrated by several studies (Mariti et al., 2011; Ricci et al., 2011).

The ability to associate music to a feeling of tranquility and emotional well-being can be a valuable tool for a behavioral modification of the dog, avoiding its relinquishment. In fact, many animals, suffering from separation problems or a real separation anxiety, are abandoned in shelters, as demonstrated by many reports (Gonzalez Martinez et al., 2011, Miller et al., 1996 and Mondelli et al., 2004). Moreover, one third of the dogs that are adopted from shelters are returned because of the dog’s behavior (Shore, 2005).

In conclusion, these preliminary results seem to confirm the possibility of using music as a valuable aid in the treatment of separation problems in dogs.

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La musica calma il cane?

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Sintesi

Lo scopo della presente ricerca è stato quello di valutare la possibilità di produrre una risposta emozionale condizionata positiva in cani con problemi da separazione, attraverso l'ascolto della musica. Per la ricerca sono stati utilizzati 14 cani con sintomi riferibili a problemi da separazione. Tutti gli animali sono stati condizionati per 20 giorni ad ascoltare, per 20 minuti, tre volte al giorno, un brano musicale, scelto dal proprietario, mentre erano in sua compagnia, in un ambiente tranquillo.

Dopo 4 giorni dalla fine del condizionamento, ogni cane è stato sottoposto a 3 test sperimentali, consistenti nel restare da solo per 5 minuti, in un ambiente sconosciuto, differente per ogni test, in silenzio o ascoltando, per la durata della sessione sperimentale, il brano musicale scelto dal proprietario o il brano di musica classica: J.S. Bach "Glenn Gould - Goldberg Variations". Il comportamento del cane è stato filmato da una video-camera posizionata all'interno della stanza sperimentale. L'analisi dei dati del comportamento del cane ha rivelato una differenza statisticamente significativa per quanto riguarda il comportamento di "abbaiare" che è espresso con una durata inferiore durante l'ascolto della musica scelta dal proprietario rispetto al brano classico ($q = 2,27$; $p < 0,05$). Anche il comportamento di "grattare la porta" è espresso con durata inferiore durante l'ascolto della musica scelta dal proprietario rispetto sia al brano classico ($q = 2,74$; $p < 0,05$), sia al periodo di silenzio ($q = 2,36$; $p < 0,05$).

I risultati, considerato il ridotto numero di animali e l'elevata variabilità individuale, sono ancora da considerarsi preliminari ma sembrano dimostrare la possibilità di condizionare il cane a un'emozione positiva come quella che l'animale sperimenta quando si trova in un ambiente tranquillo in presenza del proprietario.