



RESEARCH

Learning emotion recognition from canines? Two for the road

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KEYWORDS:

emotion recognition;
animal-assisted
therapy;
animal-assisted
intervention;
basic emotions;
emotional
enhancement;
dogs

Abstract The ability to recognize emotions is a prerequisite for interpersonal interaction and essential for emotional competencies. The present study aimed at exploring the possibility of enhancing the emotion recognition capability of human beings by using an animal-assisted intervention focusing on emotional expressions of dogs. A pre–post design was applied to 32 children aged 5–7 years and 34 adults aged 19–45 years, who received the multiprofessional animal-assisted intervention in groups of 6–12 participants. To measure emotion recognition, a computerized test, Vienna Emotion Recognition Tasks, was used to identify the emotion recognition capacity of the participants before and after 12 weeks of training. The hypotheses were tested using a general linear model with repeated measures, and effect sizes were calculated to gain further insight. The effect size eta square was used to analyze the variables on practical relevance. Results showed that the highest changes with relevant effect sizes in the adult group concerned the correct identification of anger and fear as well as the overall number of correctly identified facial expressions, including a decrease in latency to respond. The children also significantly increased their capacity for the recognition of anger and fear as well as disgust and neutral facial expressions. Additionally, they identified 5 more emotions correctly after the training and also decreased their latency to respond. The participants identified more emotions correctly and decreased their latency to respond significantly, even though “only” facial and/or emotional expressions of dogs were part of the program. A generalization process from human–dog interaction to human–human interaction seems to occur.
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Introduction

The ability to express and recognize emotions is important for emotional competence and essential for interpersonal

communication. Using these skills, individuals are able to capture the feelings of others and are therefore able to react in an empathetic way (Izard, 1994). Concerning emotion recognition, mimic as well as gesture are considered to be especially important compared with other forms of expression. This is because, to understand facial expression, there is no need for further contextual information (Darwin, 1965). Different definitions of “basic emotions” are listed in previously published data, for example, Lazarus (1991) lists guilt, envy, shame, jealousy, pride,

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relief, hope, and compassion, whereas Izard (1994) refers to disgust, interest/excitement, happiness/joy, anger, fear, grief, surprise, shame/shyness, guilt, and contempt as the 10 basic emotions.

Depending on the kind of emotion, recognizing emotional expression on faces can be either easier or more difficult. The positive emotion joy is recognized most frequently, in contrast to the emotion fear, which is identified very rarely (Hoheisl and Kryspin-Exner, 2005). Young people, in comparison with older ones, are more capable of recognizing the emotions disgust and fear, whereas grief and happiness are overall the easiest to recognize (Isaacowitz et al., 2007). Furthermore, a survey by Elfenbein et al. (2002) discovered cultural differences in emotion recognition. For example, U.S. Americans scored better in emotion recognition than Japanese and Indians. In 1988, Ekman was able to demonstrate that special basic emotions, such as happiness, surprise, fear, grief, anger, and disgust, are recognized and expressed all over the world. However, ways of activation and consequences of behavior are learned in the course of development and education and are different depending on the culture (Ekman, 1988).

Many theoreticians assume that a deficit in the knowledge of emotions can cause controversial social interactions. For example, not being able to recognize anger or fear in others may cause inappropriate patterns of behavior, which in turn can lead to conflicts (Schulze et al., 2006). Kosson et al. (2002) found that dangerously disturbed offenders have a deficiency in recognizing emotions. This is an important reason for their profound difficulties concerning socially competent behavior. Considering these explanations, it becomes clear that the development and promotion of emotion recognition is an important factor for a successful and happy life.

The potential of animal-assisted activities (e.g. Michelazzi et al., 2007) and therapy can, among other things, be found in the shared basic emotions of human beings and animals. In his book, "The Expression of the Emotions in Man and Animals," published in 1872 (cited by 1965), Charles Darwin wrote about the characteristic expressions of emotions in different animal species and showed analogies with human emotion expression. It is a fact that higher vertebrates can feel emotions similar to those displayed by human beings. Facial emotional expression should be differentiated from physiological phenomena, which may remain unrecognized by the observer. Both aspects are alike in human beings and higher vertebrates.

Perception and processing of social and emotional cues over the course of a social interaction are thought to occur before a complete cognitive analysis (Zajonc, 1984; Phelps, 2006). The fact that an emotional context can be conveyed either verbally (digital) or nonverbally (analog) results in further complexity, as seen in interspecies communication and interaction (Olbrich, 2003). With domestication, dogs have developed distinctive relationships with human beings that allow them to integrate into the social

lives of humans. Comparative research indicates that referential communication facilitates behavioral organization during shared activities (Csányi, 2000; Kerepesi et al., 2005).

Dog barks differ in their frequency and acoustic pattern, and have been linked to communicative function associated with situation-specific motivational purpose (Feddersen-Petersen, 2000; Pongrácz et al., 2005). Human beings and dogs are able to communicate with each other using acoustic signals (Yeon, 2007). Categorization of dog bark recordings allowed individual recognition of dogs by their owners and allocation of the dogs' emotional status, on the basis of 5 rating scales: aggression, fear, despair, happiness, and playfulness (Pongrácz et al., 2005). Further, the results of the study revealed that dog owners differentiate acoustic communicative cues in their dogs by analysis of distinctive temporal patterns and vocal pitch.

Conversely, dogs have proven their ability to recognize human gestures such as pointing and gazing (Ittyerah and Gaunet, 2009). These highly sophisticated communicative skills can be observed in dog pups and have presumably developed over the course of the longtime tradition of human-dog companionship (Virányi et al., 2008). It seems that dogs' skills to interpret human expressions and gestures exceed the capabilities of wolves and chimpanzees (Udell et al., 2009), although it is a known fact that facial expressions in chimpanzees share physical and functional similarities to the repertoire of human beings (Parr and Waller, 2006).

According to the social learning aspect, dogs seem to be an ideal model for human cognition. Owners use their dog's social learning ability in everyday life. For example, when the owner wants the dog to touch a special object during training, the owner touches it to let the dog know what he or she expects (Kubinyi et al., 2009). It has been suggested that the process of domestication could have forged selection of genetically predisposed individuals, particularly those with an ability to interpret human gesturing (Soproni, 2001). Nonverbal communicative skills have been found to be improved in pet owners as compared with non-pet owners, as demonstrated by Guttmann et al. (1983). Another study examined whether the behavioral patterns of dogs changed with the emotional state of their owner, and it found that dogs gazed at their owners for a longer period when they were watching a cheerful movie as compared with when they were watching a sad movie. The authors concluded that dogs seem to be sensitive to human emotional states (Morisaki et al., 2009). Animal observation and analysis of the principle of cause and effect reflecting animal behavior increases self- and emotional regulation in children (Melson, 2000; Turner et al., 2009).

Therefore, it has been proposed that incorporation of a dog as a therapeutic element along with intervention might be a potent measure to enhance mastery of nonverbal and verbal streams of communication and to promote social and emotional skills in both, children and adults.

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