

Special Issue: Human-animal relationship on animal health, productivity and welfare

# Human-Dog-Relationship and its positive effects on dogs and their humans with special needs

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**Abstract** Dogs might enjoy interaction with humans, making the human-dog relationship (HDR) important and necessary for domestic dogs. This relationship has expanded into an interaction where dogs are not solely considered companion animals but “service animals” for humans with special needs such as blindness, deafness, locomotion problems, or various conditions such as cardiovascular pathologies, epilepsy, diabetes, depression, and autism. This review aims to emphasize the effects of positive HDR on animal welfare and people with health or psychological problems, as well as individuals with special needs. It has been concluded that HDR is an interaction between humans and companion animals that might bring benefits for both. Companion animals are immersed in pleasant situations, and positive emotions might arise when keeping them physically and mentally active. Moreover, the welfare of dogs can also be improved due to the close bond with humans, who endeavor positive HDR and stress-free situations.

**Keywords:** trained dog, guide dog, service dogs, alert dogs

## 1. Introduction

Since animals have been domesticated, it has been discovered that they might enjoy interactions with humans, especially when positive interactions and emotions are elicited (Rault et al 2020). Within the positive emotions that an animal can develop, we can cite happiness, surprise, excitement (Lezama-García et al 2019), relaxation and pleasure (Boissy et al 2007).

In recent years, the acquisition of companion animals has increased considerably. In the United States (US), 95 million dogs have been reported, of which 25% of households reported caring for at least one companion animal (Muller 2014; Wall 2022), a similar number reported in Mexico (ranging from 63.3% to 72.8%) (Ortega-Pacheco et al 2007), while in the United Kingdom, it reached 31% (12 million dogs) (2023) and 25% in Ireland (Statista 2023). The same percentage as in European countries, the dog population is approximately 47% in Italy (Carvelli et al 2020), a similar number to that reported in Romania (45%), Poland (43%), and the Czech Republic (42%) (Landgeist 2022). In Australia, a total of 5.7 million dogs are reported, and 38% of households have at least one companion animal (AMA 2019).

When considering that approximately 61 million persons in the United States have some type of disability, the approximate number of 500 000 service dogs helping

their caretaker with multiple daily tasks highlights the importance of HDR (McMichael and Singletary 2021), although the number of service dogs does not reach 1%.

The relationship that humans build with their companion or service animals is influenced by several emotional, psychological, and physical factors (Williamson et al 2022). For example, training dogs to assist people with visual and hearing impairments creates a strong human-dog relationship because the dog can perform specific tasks for its human (e.g., climbing stairs, opening drawers, calling for help from other people), making them part of their daily life activities that would be difficult for the person alone in most cases (Williamson et al 2022). Rewarding these dogs through food and treats (Tallet et al 2005; Lazzaroni et al 2020) is part of training programs, so the animal decides to voluntarily interact with humans. In addition, HDR can be formed through animals' habituation to human presence, associative learning, and bonding (Rault et al 2020). Additionally, apart from receiving support from service and assistance dogs, humans' psychological distress might be lessened due to the positive dyad (Kanat-Maymon et al 2021).

HPR can have both positive and negative effects on both humans and animals, influencing their behavior (Hemsworth 2003; Kauppinen et al 2012), health, and welfare (Hemsworth and Coleman 2011; Zulkifli 2013). Numerous studies highlight the negative effects associated



with poor HPR (Pinillos et al 2016; Hemsworth et al 2018), whereas only a few mention the positive effects (Hemsworth 2003; Mueller 2014; Rault et al 2020). Consequently, this review aims to emphasize how HPRs can positively impact animal welfare and assist individuals with health or psychological issues, including those with special needs, with service animals.

## 2. Human-Dog Relationship

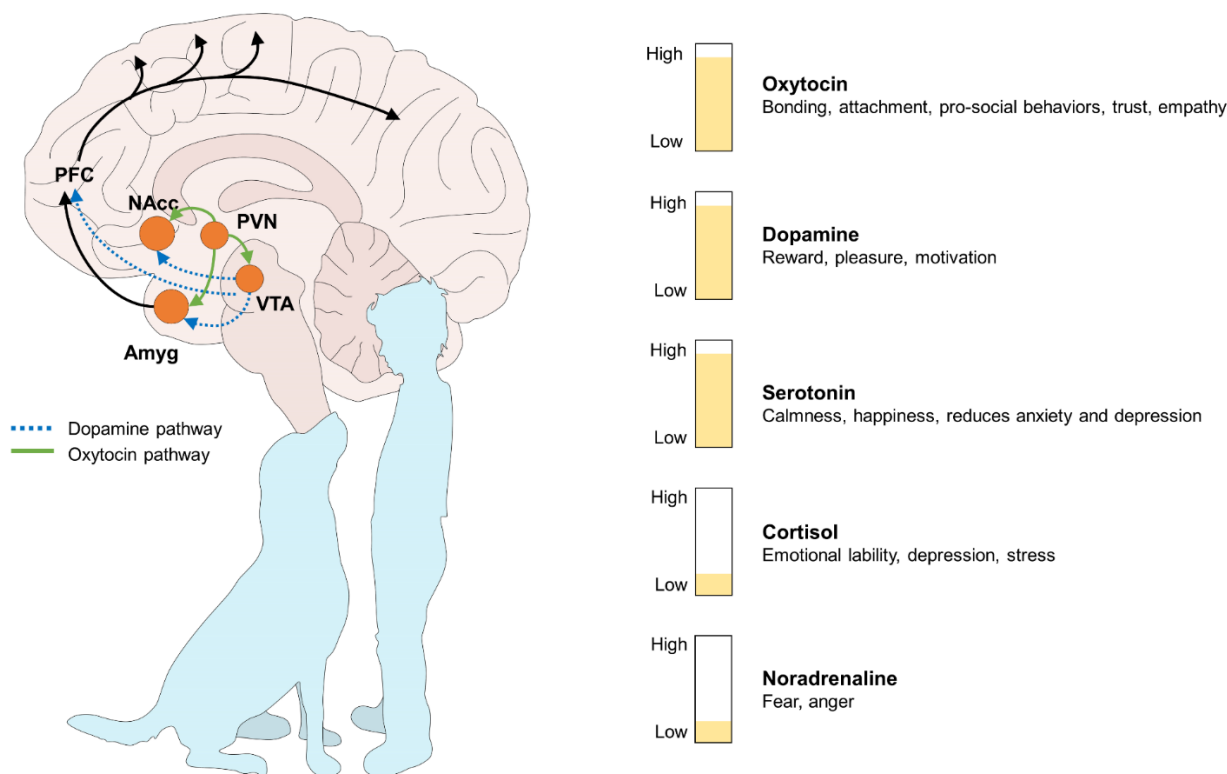
HDR refers to the bond between a human and its companion animal. It can include any species of domestic animal, but it mainly focuses on dogs and cats because they are the most popular (Kanat-Maymon et al 2021). Dogs and humans have been interacting for thousands of years (at least 30,000 years) (Overall 2017). Domestication and cohabitation between both species have predisposed dogs to establish a relationship with humans (Konok et al 2015). Since the time of the Greeks, dogs have helped humans in activities such as hunting, herding cattle or even in wars – as sentinels or protection– (Rees 2020). However, it was not until the 20th century that the training of these animals for many activities was formalized, including explosives detection (Burch and Pickel 1990). Apart from dogs being companion animals, they can serve as assistance animals, meaning that dogs perform essential functions for people with disabilities, such as emotional and physical support (Bremhorst et al 2018). Assistant dogs include service dogs (dogs “used” for medical detection and dogs that can assist people with mobility/psychiatric impairment), hearing and guide dogs (Mengoli et al 2021). In this way, different categories have been described: assistance, service, and

emotional support animals, seizure-alert and diabetes-alert dogs, support dogs for autistic people, and guide dogs for deaf and blind people (McMichael and Singletary 2021). These are affective and work relationships that go hand in hand and where strong bonds are generated between both members of the dyad (Lane et al 1998). Moreover, the function of service dogs often intertwines with their role as companion animals without a clear limit between them.

With this evolution, new disciplines emerged, such as ethology, which is the basis for understanding animals’ behavior. This knowledge can be applied to develop training techniques, so the animals perform the activities for which it is needed (Griffin 1978).

## 3. Physiology of HDR

From a physio-endocrinological standpoint, several neurotransmitters participate in both humans and dogs when establishing a positive relationship, as depicted in Figure 1 (De Dreu 2012; Petersson et al 2017; Akiyama and Ohta 2021). In particular, oxytocin is the main hormone found to be associated with intra/interspecific attachment and pro-social behaviors (Ogi et al 2020). Dopamine and serotonin are other neurotransmitters closely related to positive emotions and pro-social attitudes (González-Martínez et al 2023). Conversely, during bonding, in humans and animals, a decrease in cortisol and noradrenaline has been found, representing a possible diminished stress response (Handlin et al 2012). All these neurotransmitters and the systems in which they are involved can improve coping strategies and promote social adaptation throughout the evolution of mammals (Ogi et al 2021).



**Figure 1** Neuroendocrine control of human-animal bonding. The yellow bars indicate the impact of the main neurotransmitters involved in HDR. Amyg: amygdala; NAcc: nucleus accumbens; PFC: prefrontal cortex; PVN: paraventricular nucleus; VTA: ventral tegmental area.

#### 4. Effects of HDR

HDR can elicit positive effects on the physical and psychological health and well-being of both dogs and humans; however, it can also produce negative effects, as will be discussed below.

##### 4.1. Positive effects

Various positive results of HDR have been cited. These tend to have long-lasting effects. On the one hand, people benefit from the companionship of dogs (Hall et al 2021), with feelings of contentment, love, and happiness. The services that dogs provide are also beneficial for caretakers or humans in general, such as guide dogs (Rooney et al 2004), search and rescue dogs, hunting dogs, guardian dogs (Hall et al 2021), and alert dogs (Wright et al 2007; Hardin et al 2015; Wells 2019; McMichael and Singletary 2021).

It has been shown that companion animals can help reduce stress in humans in more efficient ways than conspecifics (Archer and Ireland 2011). Reducing levels of stress in humans has been associated with cardiovascular benefits such as preventing hypertension (Wright et al 2007). It has also been seen that in cases where people feel lonely or depressed, dogs can provide important emotional support for them (Lane et al 1998). During the COVID-19 pandemic, a survey assessing depression scores in dog owners and potential dog owners concluded that dog owners had lower depression scores (Martin et al 2021).

When acquiring a companion animal, many humans are forced to change their habits, since dogs require walks and socialization, which is why another of the beneficial factors of HDR is the increase in physical activity with the consequent loss of weight, which can favor people with obesity or overweight (Mueller 2014). Therefore, dog ownership can improve physical and psychological well-being, as shown by Lane et al. (1998), who observed that 69% of the subjects were more relaxed when having a dog at home.

Among other positive emotional effects of HDR, dogs can act as social facilitators by encouraging interaction with other individuals and thus integration into a social group. An example of this is found in the study by Westgarth et al (2021), who reported that recreational walks with dogs helped to involve several members of the family (Glenk et al 2019). For example, individuals who have had pets in their life are less socially isolated when reaching more than 65 years (Hajek and König 2020). Similarly, guide dogs facilitate the social interaction of people with visual impairment, decreasing their levels of depression and providing a certain degree of independence to approach other people (McIver et al 2020).

In this sense, dogs are a great emotional support for people who have some emotional condition or are grieving, as has been seen in people with major depression and

posttraumatic disorder (PTSD) in whom service dogs help to reduce the symptomatology of these disorders and emotional benefits (Woodward et al 2021; Richerson et al 2023).

Other emotional benefits that have been reported due to dog ownership are that humans feel useful and valued by serving as the provider of affection and food for the animal (Barbiero and Berto 2021). Dogs help to improve the physical condition and overall health of the handler (Glass et al 1993; Lane et al 1998) and to overcome traumatic situations that could diminish the social and labor capacities of the individuals who experienced them (Siegel 1990).

Animal welfare and dog management can also be improved when providing positive interactions that avoid dogs' stress (Rault et al 2020). A clear example of how a positive HDR can favor animal welfare is in shelter dogs, where adequate interaction with humans decreases cortisol levels in dogs (Coppola et al 2006; Menor-Campos et al 2011). In this sense, dogs are easier to train and improve adoption success (Luescher and Tyson 2009).

HDR influences the social perception of companion animal welfare. Recognizing dogs as a part of the family positively influences law promotion to ensure the wellbeing of animals (Carlone et al 2019). The interest in forming healthy bonds with their pets incites the search for ways to provide better living conditions for these animals (Swaigood 2007). Therefore, positive HDR could be directly linked to the quality of life of both humans and animals. In this relationship, the reward system and its dopaminergic projections modulate part of the positive outcomes of an adequate interaction (Arias-Carrión et al 2014). When humans develop a bond with their dog – particularly with a service dog – some of the mentioned benefits can be reflected in humans' physical and emotional health, such as feelings of love and satisfaction (Damberg and Frömbling 2022) as well as alerts from different disorders (Figure 2) (Catala et al 2020).

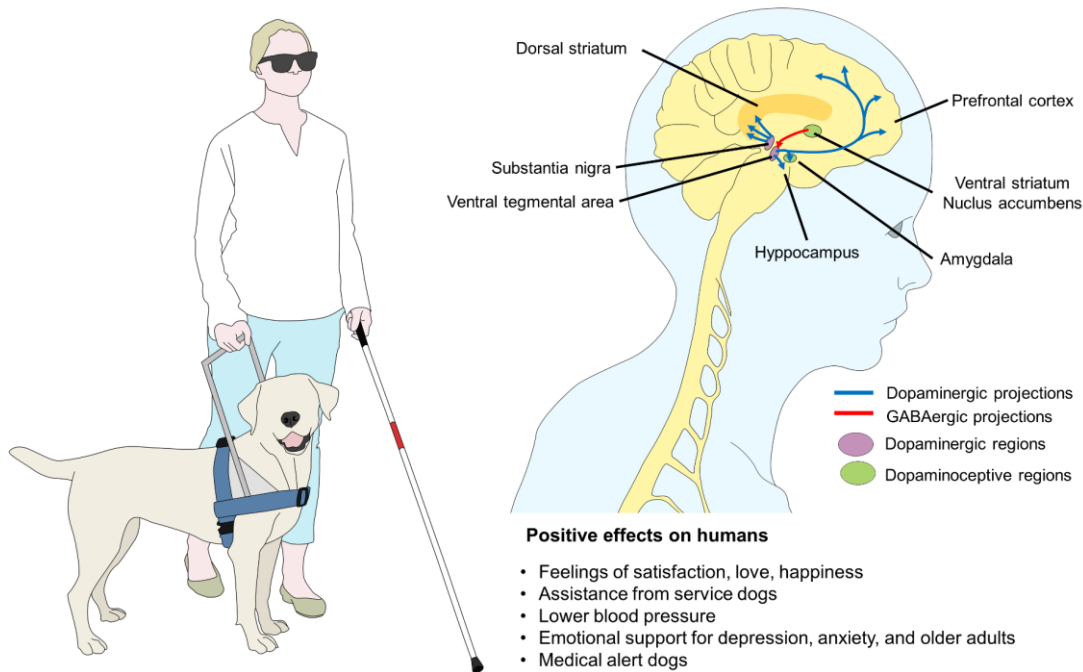
##### 4.2. Negative effects

The implications of losing companion animals – assistance dogs, in particular – can negatively impact the emotional stability of their human partners, could cause frustration and stress and could even generate unexpected expenses. Indeed, the dependence that humans have with pets could be very marked, and the loss of assistance dogs could cause serious daily routine constraints (Archer 1997; McMichael and Singletary 2021).

In the same way, it is known that the "experience of security and comfort obtained from the relationship with the partner" (Ainsworth 1989) could also generate something called a "secure base" in dogs (Mariti et al 2013; Mariti et al 2020). Secure attachment helps individuals to have more confidence to cope with the environment in normal and threatening situations (Gácsi et al 2013).

However, this can also cause negative effects when the companion animals have insecure attachment with their caretakers (Wanser and Udell 2019). In these cases, dogs can show signs of anxiety, stress or fear, behavioral responses that characterize nonadaptive coping strategies that can trigger so-called separation anxiety or separation-

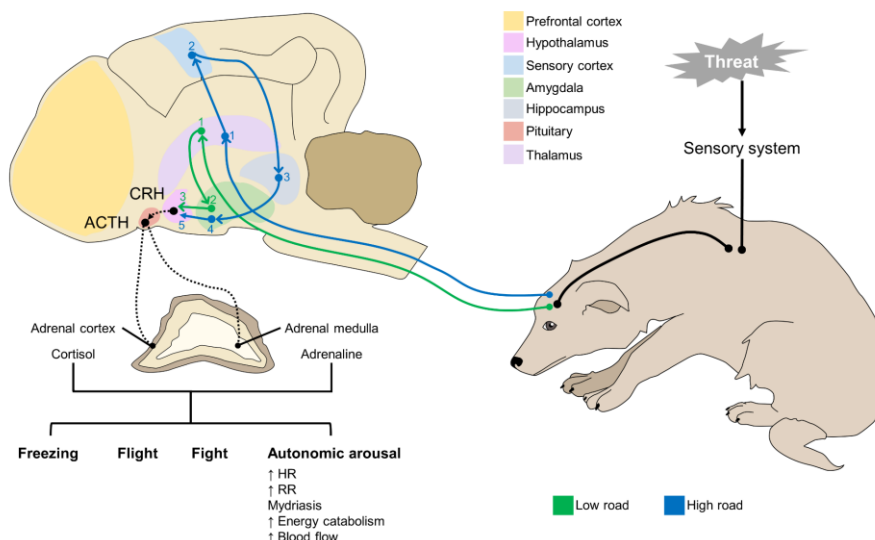
related disorder (SRD). Furthermore, Konok et al (2019) found that guardians' style of attachment could influence the presentation of SRD in dogs, where highly worried/stressed humans can have a negative influence on the behavioral response of their companion animal.



**Figure 2** Positive effects of human-pet-relationship.

The brain structures involved in the SRD mechanism are the prefrontal cortex, hypothalamus, sensory cortex, amygdala, hippocampus, pituitary gland, and thalamus. Figure 3 shows that when an animal perceives a threat using their sensory system, the fear response is mediated in the amygdala by two main pathways: the low road (marked with green numbers and lines) and the high road (marked with blue numbers and lines) (Ledoux 2001). The low road is a subcortical connection between the thalamus, which reads the input from the periphery to the amygdala, the hypothalamus, and the pituitary gland, where fear is not

processed in the sensory cortex and the emotional responses are rapid, similar to a fight-flight pattern (Kikusui et al 2019). The high road follows a more complex pathway from the thalamus to the sensory cortex, the hippocampus, the amygdala, the hypothalamus and, finally, the pituitary. In the high road, the integration of the signal represents a cognitive processing of the emotional response to a threat (Chen 2019). Both processing pathways end on the pituitary, where endocrine, autonomic, behavioral, and metabolic changes take place to permit the animal to adapt (Kooriyama and Ogata 2021).



**Figure 3** Fear and anxiety in dogs suffering separation-related disorder. ACTH: adrenocorticotrophic hormone; CRH: corticotropin release hormone; HR: heart rate; RR: respiratory rate.

A particular element that needs to be mentioned when categorizing HDR as positive or negative is anthropomorphism. Anthropomorphization refers to conferring human characteristics to inanimate objects or nonhuman animals (Horowitz and Bekoff 2007; Mota-Rojas et al 2021b). In regard to mammal companion animals, similarity to human beings could lead people to regard them as humans and impose their likes/dislikes and beliefs (Archer 1997). In a study assessing dogs that had been treated as humans, the results found that anthropomorphized dogs had a higher risk of behavioral problems such as aggression, inappropriate elimination, and vocalization, among others (Hawkins et al 2021; Pickersgill et al 2023). However, some positive outcomes have been observed due to anthropomorphism (Mota-Rojas et al 2021b). Examples of these positive effects are that seeing dogs as animals that can feel as humans has promoted more interest in animal behavior and understanding animal body language and facial expression (Mota-Rojas et al 2021a). Similarly, this has helped to recognize that animals are able to feel pain and encourages pain prevention strategies (Chan 2012; Choueiki et al 2021). Therefore, although humans might not be able to say that animals feel happiness as they do, anthropomorphism helps to identify that animals can have emotions of their own.

According to these findings, the type of established bond and the way it develops through the animals' life dictates most of the behavioral responses that will be exchanged between humans and dogs (Rault et al 2020).

**5. Training strategies for service dogs to promote a positive HDR**

Diverse methods have been developed to determine if the selected animal could be capable of becoming an assisting dog. For example, when considering animal-related elements, genetics (temperament of the bitch), early socialization, adaptation to the environmental elements

characteristic of the service they will provide (e.g., habituation to a wheelchair) (Bray et al 2019), and anatomical-functional elements studied by magnetic resonance imaging have been used to identify the animal as a potential service dog (Berns et al 2016). Regarding caretaker-related elements questionnaires applied to the caretakers, breeders or trainers might help to indicate if the candidate is appropriate to have a service dog (Wiener and Haskell 2016). In the last century, training techniques and animal behavior science have made important advances (Hall et al 2021). Most of the training is based on three aspects: habituation, associative learning, and bonding.

*5.1. Classic conditioning*

It is necessary to consider and understand canine sensory abilities to comprehend canine psychology and learning processes. Visual (Byosiere et al 2018), auditory (Fukuzawa et al 2005), and olfactory (Walker et al 2006) stimuli are used by dogs to explore and learn about their environment. Animals learn through three main mechanisms: classical/Pavlovian conditioning, operant conditioning, and social learning (Hall et al 2021).

Associative learning can develop HDR in a much faster and easier way because the animal will associate the human with positive and pleasant situations. The point to consider is what learning associated with positive situations should be established, for example, caresses, pleasant food for them, brushing, or even in some occasion's music (Rault et al 2020).

*5.2. Habituation*

Habituation is a way to reduce fear of humans by exposing animals to repetitive situations in a neutral, stress-free context (Mota-Rojas et al 2020). Interactions should be gradual, and at first, there should be no direct contact so that the animal gets used to it. Gazzano et al (2008) reported that early interaction with puppies (gentling)





strongly influences emotional stability. It is therefore desirable that the puppy is exposed to a variety of low-intensity visual, olfactory, tactile and auditory stimuli prior to direct contact with its new human (Hemsworth et al 1989; Guesdon et al 2016; Tallet et al 2018). It should be noted that for some species, such as birds, visual contact alone is sufficient, and direct contact does not occur (Barnett et al 1994). (Barnett et al 1994).

### 5.3. Bonding

Bonding refers to all initial contact that parents have with their offspring, either prenatally, that is, during pregnancy or when the newborn has born. This contact is part of the initial link that this new being will establish with its parents (especially with the mother), since being defenseless, the newborn will look for a central figure of reference that will protect it in the unknown world that surrounds it (Rault et al 2020).

To establish an HDR, it is necessary to integrate both associative learning and bonding. Bonding can be established as a need for the puppy to feel safe, especially during its first months of life (Gazzano et al 2008; Mariti et al 2020). In the same way, it is important to provide correct socialization during this period so the animal can recognize humans and their environment as a positive stimulus (Nowak and Boivin 2015). Currently, this bond can develop more easily due to the close coexistence that humans have with dogs, and it is also very common for them to be considered part of the family or even as my children (Archer 1997).

## 6. Benefits of HDR: Assistant dogs

For many years, dogs have been serving humans with certain mobility or intellectual disabilities by performing actions such as turning on lights, picking up objects that have fallen, opening, or shutting doors, bringing the newspaper or other objects (Lane et al 1998), and in the best-known cases, guiding blind or low vision people (Bray et al 2019). More recently, medically alert dogs have served as a support to people with health conditions that represent a threat to their daily lives (Reeve et al 2021a), such as epilepsy or diabetes (Catala et al 2020) and psychological disorders (depression and PTSD) (Rodriguez et al 2021). Thus, organizations have been founded in the United Kingdom, such as Guide Dogs for the Blind (1931), Hearing Dogs for the Deaf (1982) and Dogs for the Disable (1986) (Lane et al 1998).

It should be noted that the training for assistance dogs is based on positive conditioning where the dog is stimulated or rewarded when it does what you want it to do. Next, we will briefly mention the areas where these animals can help to improve human lives.

### 6.1. Heart diseases

Worldwide, cardiovascular diseases are a leading cause of death (Wright et al 2007), with an estimated 17.9

million deaths per year (WHO 2023). Cardiac alert dogs – also called cardiac service dogs – are service animals that can detect drops in blood pressure that might lead to unconsciousness (Reeve et al 2021a). When detecting an alteration in blood pressure or chemical alterations that might change heart rate, dogs alert their guardians so they can sit on the floor to prevent injuries, bring medication, and even call other people or emergency services (Graymore 2023; Reve et al 2021b). It has been reported that the accuracy of dogs alerts a total of 33 different medical conditions (e.g., anxiety, hypoglycemia, seizures, among others), including heart complications.

Wright et al (2007) reported that participants who had ever owned a dog had a lower systolic blood pressure (SBP) (mean 136.2 mmHg 134.7–137.7 vs. 141.9 mmHg 139.3–144.6) and pulse pressure (mean 59.9 58.6–61.2 vs. 66.3 63.9–68.6) than those who never owned pets. If we add to this that owning a dog makes the caretakers have more physical activity, then we can say that the heart disease patient is also favored in this way (Lane et al 1998).

### 6.2. Epilepsy

Within the functions that these assistance animals have, this may include breaking a fall when their guardian is having a seizure, getting between their caretaker and anything that could harm them (Brown and Goldstein 2011; McMichael and Singletary 2021). Support dogs for patients with seizures are very useful because seizures are unpredictable most of the time, but certain behavioral changes and some smells in humans can be identified by these dogs to alert people (Strong et al 1999). Ortiz and Liporace (2005) performed a comparative study to determine the ability of seizure-alert dogs to predict epileptic activity in patients undergoing electroencephalography (EEG). When comparing dogs to EEG, the animals were found to be less effective in predicting seizures. However, animals are more accessible and enjoyable than an ECG. Furthermore, Strong et al (2002) found a significant reduction in the frequency of seizures (43%) in subjects with seizure-alerting dogs, which could justify their participation in the study by itself.

There are many training centers for assistance dogs; however, to train alert dogs for seizures, to date, only 15 centers exist in the United States, and a few exist in Spain (such as ACEA or CANEM, Can Do Canines) (Dalziel et al 2003). Therefore, it is important to further develop this type of training to meet this need.

### 6.3. Diabetes

Diabetes-alert dogs (DADs) can assist humans by reminding them to perform their glucose measurements or by warning humans of hypoglycemia/hyperglycemia (Hardin et al 2015). This is relevant because one of the main complications of type 1 diabetes is hypoglycemic episodes (Briscoe and Davis 2006; Wild et al 2007). According to the literature, DAD has a sensitivity (correctly identified as

positive) of 0.29-0.80 and a specificity (correctly identified as negative) of 0.49 - 0.96 (Lippi and Plebani 2019).

DADs are selected through assessments that evaluate several parameters, such as temperament, shape and size of their nostrils and weight, and age between 9 and 18 months (Hardin et al 2015). The training of these dogs is a good example of classical conditioning, which consists of collecting saliva samples from people with normoglycemia and hypoglycemia, showing them to the dog and conditioning it with positive stimuli so that it learns to point out those with hypoglycemia (Hardin et al 2015).

#### 6.4. Guide dogs

Guide dogs are considered an extension of the handler because they help them in practically any activity that the person may require. Hence, the bonds formed in this human-dog relationship (HDR) are exceptionally close, making it crucial to train these dogs in the most effective manner to yield positive effects, enabling the animal to perform its duties without any form of stress. (McMichael and Singletary 2021). Published studies have addressed the aspects involved in the selection and training of guide dogs (Weiss and Greenberg 1997; Wilsson and Sundgren 1997; Coppinger et al 1998; Batt et al 2008), breeding and genetic programs (Goddard and Beilharz 1982, 1983, 1984a, b), raising of pups (Koda 2001a, b; Serpell and Hsu 2001; Kikkawa et al 2005), temperament tests (Goddard and Beilharz 1984a, b; Murphy 1995; Batt et al 2008) and cortisol concentrations (Hydbring-Sandberg et al 2004; Haubenhofer et al 2005; Jones and Josephs 2006).

During selection, these dogs can fail at any stage of the training program from 20 weeks of age. Among the reasons for failure are health problems, anxiety, lack of concentration, behavioral problems (Gazzano et al 2008), excitability, attraction or distraction by smells, submission, temperament, and problems with learning the correct places to perform their eliminations (Harrison 2006). One of the most commonly used ways to determine if a dog can be used to be trained as an assistance dog is the application of questionnaires to temporary guardians, who, by living with these puppies during the first eight weeks of life, can have an idea of their temperament and behavior in some situations (Bray et al 2019). In this sense, the Canine Behavioral Assessment and Research Questionnaire was developed and validated for guide dogs (Serpell and Hsu 2001).

Guide dogs can improve the lives of visually impaired or blind people by helping them walk more safely and quickly in unfamiliar places (Walther et al 2017), promoting self-confidence, peace of mind, a high degree of independence, improving their level of socialization and, of course, making them feel safe and confident (Hart and Yamamoto 2016).

#### 6.5. Autism

Autism spectrum disorder (ASD) is a set of neurodevelopmental signs that make communication and socialization with other individuals difficult. There are various studies that have shown that HDR can be of great help in the therapy of this disease and help the patient improve their development (Tseng 2023).

Autism assistance dogs (AADs) have been helpful in preventing autistic children from self-harm while making both children and parents feel safe (Leung et al 2021). In a great part of the world (USA, UK, Spain, Netherlands, France), these dogs have access to any area where the child is going to enter, and they are also the connection that the child can have with the rest of the individuals, thereby making socialization a little less reckless for them (Carlisle 2015; Becker et al 2017). According to Tseng (2023), there are some breeds of dogs that can be better suited for this task; however, Golden Retrievers, Labradors and Standard Poodles have performed adequately. The training for these dogs begins in early stages, and it is not until 18 months of age that the HDR begins to be generated with which it will be the handler and it is presented to the child that it will help with the management of posttraumatic stress, also giving emotional and educational support. Total training normally takes 8-12 weeks for the dog to complete it (Tseng 2023).

#### 7. Future directions

In any HDR, it is important to identify in each dog the motivation – whether physical or emotional – that promotes a successful interaction. Some might be motivated by food, caresses, games, or toys (Triana and Pasnak 1981), and others can even read human facial expressions as well as body postures that indicate our emotions and intentions, achieving acceptance and satisfaction on the part of the person.

Studies have been carried out on Border Collies, where it has been seen that they have learned to interpret the spoken language of humans by understanding complete sentences (Pilley 2013). To achieve a successful HDR interaction, it is essential to understand the animal and its preferences. In the same way, multiple tools, such as smells, flavors or sounds, can be used to help generate positive effects on dogs so that HDR is generated more easily and ensure that there is communication between both parties.

Additionally, it is necessary to take advantage of all social interactions, making them pleasant, and thus, the animals in question become accustomed to common life situations, making their learning efficient by reducing stress and improving their welfare.

Another important point is that assistance and work dogs tend to live in different places in their first months of life in temporary homes (Hall et al 2021); it is necessary that this try to minimize it because in each place ties are generated and the fact that these ties are broken can destabilize the animal and decrease its learning and performance.

Finally, science should improve the welfare of service dogs, e.g., by detecting stress signals and giving the handler the right advice on how to recognize signs of discomfort in the dog and how to correct the cause (Koda et al 2015).

## 8. Final Considerations

Positive HDR is an interaction formed between humans and companion animals that is beneficial for both parties. Humans benefit from the help and support that service animals can provide to people with special needs. The quality of human life can be positively improved, not only physically but also mentally. In addition to receiving unconditional love and acceptance from the animals toward their caretakers. On the other hand, companion animals, usually dogs or cats, can develop positive emotions when they are included in pleasant situations, both physically and mentally active. Among these positive effects, their welfare can be improved, and stressful situations might be reduced.

Throughout the development of HDR, it has been seen that assistance and service animals can help humans in multiple situations, such as blindness, diabetes, autism, cardiovascular disease, and epilepsy. For this reason, it is very important that HDR is carried out in favorable situations and with positive rewards so that the animal develops its potential to the maximum.

### Ethical considerations

Not applicable.

### Conflict of Interest

The authors declare that there is no conflict of interest with this work.

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