Quotation of dogs

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Humans have long realized that dogs can be helpful, in a number of ways, to achieving important goals. This is evident from our earliest interactions involving the shared goal of avoiding predators and acquiring food, to our more recent inclusion of dogs in a variety of contexts including therapeutic and educational settings. This paper utilizes a longstanding theoretical framework- the biopsychosocial model- to contextualize the existing research on a broad spectrum of settings and populations in which dogs have been included as an adjunct or complementary therapy to improve some aspect of human health and well-being. A wide variety of evidence is considered within key topical areas including cognition, learning disorders, neurotypical and neurodiverse populations, mental and physical health, and disabilities. A dynamic version of the biopsychosocial model is used to organize and discuss the findings, to consider how possible mechanisms of action may impact overall human health and well-being, and to frame and guide future research questions and investigations.

Introduction – A Historical Perspective on Dog-Human Relationships

The modern relationship between humans and dogs is undoubtedly unique. With a shared evolutionary history spanning tens of thousands of years ([1](https://www.frontiersin.org/journals/veterinary-science/articles/10.3389/fvets.2021.630465/full#B1)), dogs have filled a unique niche in our lives as man's best friend. Through the processes of domestication and natural selection, dogs have become adept at socializing with humans. For example, research suggests dogs are sensitive to our emotional states ([2](https://www.frontiersin.org/journals/veterinary-science/articles/10.3389/fvets.2021.630465/full#B2)) as well as our social gestures ([3](https://www.frontiersin.org/journals/veterinary-science/articles/10.3389/fvets.2021.630465/full#B3)), and they also can communicate with us using complex cues such as gaze alternation ([4](https://www.frontiersin.org/journals/veterinary-science/articles/10.3389/fvets.2021.630465/full#B4)). In addition, dogs can form complex attachment relationships with humans that mirror that of infant-caregiver relationships ([5](https://www.frontiersin.org/journals/veterinary-science/articles/10.3389/fvets.2021.630465/full#B5)).

In today's society, dog companionship is widely prevalent worldwide. In the United States, 63 million households have a pet dog, a majority of which consider their dog a member of their family ([6](https://www.frontiersin.org/journals/veterinary-science/articles/10.3389/fvets.2021.630465/full#B6)). In addition to living in our homes, dogs have also become increasingly widespread in applications to assist individuals with disabilities as assistance dogs. During and following World War I, formal training of dogs as assistance animals began particularly for individuals with visual impairments in Germany and the United States ([7](https://www.frontiersin.org/journals/veterinary-science/articles/10.3389/fvets.2021.630465/full#B7)). Following World War II, formal training for other roles, such as mobility and hearing assistance, started to increase in prevalence. Over the decades, the roles of assistance dogs have expanded to assist numerous disabilities and conditions including medical conditions such as epilepsy and diabetes and mental health disorders such as posttraumatic stress disorder (PTSD). At the same time, society has also seen increasing applications of dogs incorporated into working roles including detection, hunting, herding, and protection ([8](https://www.frontiersin.org/journals/veterinary-science/articles/10.3389/fvets.2021.630465/full#B8), [9](https://www.frontiersin.org/journals/veterinary-science/articles/10.3389/fvets.2021.630465/full#B9)).

In addition to these working roles, dogs have also been instrumental in supporting humans in other therapeutic ways. In the early 1960s, animal-assisted interventions (AAI) began to evolve with the pioneering work of Boris Levinson, Elizabeth O'Leary Corson, and Samuel Corson. Levinson, a child psychologist practicing since the 1950s, noticed a child who was nonverbal and withdrawn during therapy began interacting with his dog, Jingles, in an unplanned interaction. This experience caused Levinson to begin his pioneering work in creating the foundations for AAI as an adjunct to treatment ([10](https://www.frontiersin.org/journals/veterinary-science/articles/10.3389/fvets.2021.630465/full#B10)). In the 1970s, Samuel Corson and Elizabeth O'Leary Corson were some of the first researchers to empirically study canine-assisted interventions. Like Levinson, they inadvertently discovered that some of their patients with psychiatric disorders were interested in the dogs and that their patients with psychiatric disorders communicated more easily with each other and the staff when in the company of the dogs ([11](https://www.frontiersin.org/journals/veterinary-science/articles/10.3389/fvets.2021.630465/full#B11), [12](https://www.frontiersin.org/journals/veterinary-science/articles/10.3389/fvets.2021.630465/full#B12)). Over the following decades, therapy dogs have been increasingly found to provide support for individuals with diverse needs in a wide array of settings ([13](https://www.frontiersin.org/journals/veterinary-science/articles/10.3389/fvets.2021.630465/full#B13)).