**A Preliminary Study of the Impact of Service Dogs on People with Physical Disabilities: Activities of Daily Living, Social Connectedness, Employment, and Quality of Life**

by

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Abstract

The use of service dogs as a holistic intervention for individuals with physical disabilities has increased in the past few decades. There is a relatively new body of research that demonstrates that service dogs positively impact their handlers' independence in completing activities of daily living, social connectedness, employment and quality of life because of the human-canine bond. To date, however, only a handful of empirical studies exist that demonstrate the positive impact of service dogs in the lives of individuals with physical disabilities. The existing studies often focus on just a subset of the physical disability population (e.g., autism spectrum disorder, diabetes, epilepsy, etc.). There is a clear need for additional research to address the gaps in the literature and contribute to the empirical evidence for the use of service dogs as a holistic intervention for individuals with physical disabilities. The aim of the current study was to examine the impacts service dogs have on individuals with diverse physical disabilities regarding their activities of daily living, social connection, employment and quality of life. To examine these constructs, a cross-sectional survey research design for quantitative descriptive research was utilized. The results of this study have implications for future research and contribute to the growing literature surrounding the holistic benefits of service dogs for individuals with disabilities.

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Table of Contents

Abstract ..... ii

Acknowledgments ..... iii

List of Tables ..... vii

Chapter I Introduction and Review of the Literature ..... 1

Definition of Terms ..... 8

Literature Review ..... 9

Significance of the Study ..... 30

Hypotheses ..... 32

Summary ..... 34

Chapter II Methodology ..... 38

Research Design ..... 39

Measures ..... 44

Data Collection and Procedures ..... 51

Analytic Strategies ..... 56

Summary ..... 60

Chapter III Results ..... 64

Demographics ..... 65

Research Question 1 ..... 71

Research Question 2 ..... 73

Research Question 3 ..... 73

Research Question 4 ..... 81

Research Question 5 ..... 82

Research Question 6 ..... 84
Research Question 7 ..... 85
Research Question 8 ..... 89
Summary ..... 90
Chapter IV Discussion ..... 93
Findings ..... 97
Limitations of the Study ..... 107
Implications for Future Research ..... 113
Summary ..... 117
Chapter V Manuscript ..... 121
References ..... 172
Appendix A Contact Organizations for Study Participant Recruitment ..... 188
Appendix B Study Survey ..... 190
Appendix C Raffle Survey ..... 207
Appendix D Site Authorization Letter ..... 208

List of Tables

Table 1 Demographics ..... 65

Table 2 PSMS-Self Results ..... 72

Table 3 Ability to Participate in Social Activities Results ..... 76

Table 4 Social Isolation Results ..... 78

Table 5 Companionship Results ..... 80

Table 6 QOLS Results ..... 88

## Chapter I. Introduction and Review of the Literature

In the United States, there are currently over 500,000 individuals with disabilities who use service dogs, a number which is expected to continue to rise because of the numerous benefits service dogs provide to their handlers (Muramatsu et al., 2015; Trainer, 2016). A service dog is a canine that has been training to assist or complete a task for an individual with a diagnosed disability (ADA, 1990). The task that the service dog is trained to complete, such as pulling a wheelchair or retrieving items, is the primary benefit service dogs provide to their handlers (Crowe et al., 2014; Levey & Chappy, 2017; O'Haire & Rodriquez, 2018; Rintala et al., 2002). Research, however, has indicated that there are multiple secondary benefits service dogs also provide (Allen & Blascovich, 1996; Camp, 2011; Carr et al., 2018; Hall et al., 2017; Lundqviat et al., 2019; McIver et al., 2020; Rintala et al., 2002).

Secondary benefits of service dogs include decreased negative psychological and physiological symptoms (Chandler, 2018; Fine, 2018; Hogawood et al., 2017; House et al., 2018; O'Haire, 2013; Parshall, 2003; Stapleton, 2016; Walsh, 2009), improved performance of activities of daily living (Crowe et al., 2014; Hall et al., 2017; Levey & Chappy, 2017; Rintala et al., 2002), increased rates of employment (Crowe et al., 2014; Thorne et al., 2017; Yount et al., 2013), greater social connectedness (Champagne et al., 2016; Crowe et al., 2014; Guest et al., 2006; Hicks & Weisman, 2015; McNicholas & Collis, 2000), and improved self-perceptions of quality of life (Camp, 2001; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002; Rodriquez et al., 2019). These secondary benefits to a person who uses a service dog have been attributed to the human-canine bond, which is the strong, universal emotional connection humans share with canines (Hicks & Weisman, 2015; Maharaj et al., 2018). This bond is what allows service dogs

to transcend their primary tasks and holistically and positively impact their handlers' lives (Hicks & Weisman, 2015; Maharaj et al., 2016; Walsh, 2009).

Because of the growing number of services dogs and a deepening understanding of their primary benefits for individuals with disabilities, researchers have recently begun exploring the secondary benefits accrued to individuals with specific disabilities, such as autism spectrum disorder, diabetes, or epilepsy, in everyday environments when using a service dog (Hoagwood et al., 2017; O'Haire, 2013; Parenti et al., 2013). Exploring the secondary benefits of service dogs for specific populations has yielded valuable information, such as how service dogs decrease the need for assistance when completing activities of daily living for individuals with severe ambulatory disabilities (Allen & Blaschovick, 1996) or how service dogs increase quality of life and activity levels of individuals with hearing loss (Lundqvist et al., 2018). Limited research exists, however, that would enable those secondary benefits to be generalized to a broader group of individuals with diverse physical disabilities.

The term physical disability is an umbrella term that encapsulates a number of disabilities including multiple sclerosis, spina bifida, spinal cord injury, amputation, cerebral palsy, muscular dystrophy, hearing impairment, visual impairment, epilepsy, arthritis, dwarfism, and brain injury (Mackelprang & Salsgiver, 2016). All disabilities falling under the umbrella term of physical disability have the commonality of being conditions that cause limitations within the areas of physical functioning, mobility, activities of daily living, dexterity, and endurance when combined with contextual factors (Dunn & Brody, 2008; Mackelprang & Salsgiver, 2016; Malik & Anton, 2013). Although it can be assumed that if service dogs benefit other specific populations of individuals with disabilities, they will also benefit individuals with diverse

physical abilities. As stated previously, very limited research on the secondary benefits of service dogs for the population of individuals with diverse physical abilities has been conducted.

Additionally, literature exploring the benefits of service dogs for individuals with disabilities has tended to focus on a single, specific construct or benefit, such as social connectedness (Hicks & Weisman, 2015; Rodriquez et al., 2019), employment (Glenn, 2013; Rudastam et al., 2012), and quality of life (Hall et al., 2017; Lundqviat et al., 2018; McIver & Mills, 2020). This research has been valuable and provides the foundational understanding of the secondary benefits of service dogs. Literature providing a fuller view of the multiple secondary benefits of service dogs, however, is scarce, as the use of service dogs is a relatively new intervention for individuals with disabilities. Additional research is required to further validate the effectiveness of service dogs for individuals with disabilities and more holistically understand a fuller range of benefits that accompany the use of service dogs.

The purpose of the current study was to empirically examine the holistic impact service dogs have on individuals with physical disabilities regarding the individuals' abilities to more independently perform activities of daily living, establish and maintain social connectedness, gain and maintain employment, and self-perceptions of their quality of life. By exploring these four constructs, which are critical to the independence and inclusiveness of people with disabilities, this study provided additional information to address the gap in the literature that exists regarding the reliability and validity of service dogs as an intervention and provided a more holistic understanding of the secondary benefits of service dogs. Additionally, participants in this study represented a diverse range of physical disabilities, which provided support for the use of service dogs for individuals in the context of the broader population.

As previously stated, a service dog is a canine that has been trained to assist or complete a task for an individual with a diagnosed disability, which is the primary benefit service dogs provide to their handlers (ADA, 1990). Despite being legally defined by the Americans with Disabilities Act of 1990, confusion still exists regarding the rights, requirements, and individuals protected while using service dogs due to other classifications of working dogs. Specifically, service dogs are often confused with emotional support animals (Parenti et al., 2013; Winkle et al., 2011). This confusion creates barriers for individuals who use service dogs to address functional limitations as they engage in activities throughout their daily life, such as inappropriate etiquette for interacting with service dogs (Thorne et al., 2017; Winkle et al., 2011). The confusion surrounding the rights, requirements, and protections while using service dogs can be reduced if researchers continue to explore the benefits of service dogs to increase the use of service dogs as an intervention for individuals with disabilities, thereby increasing society's understanding of the rights and multiple benefits of service dogs.

In addition to their primary benefit, service dogs provide their handlers with multiple secondary benefits that are derived from the human-canine bond (Carr et al., 2018; Crowe et al., 2014; Hall et al., 2017; 2011; O'Haire & Rodriquez, 2018; Rintala et al., 2002; Thorne et al., 2017; Winkle et al.,2011). Research indicates that negative psychological and physiological symptoms decrease within the first few seconds of interacting with a dog, because humans innately experience a universal bond with dogs (Beetz et al., 2011; Campo & Uchino, 2013; Chandler, 2018; Fine, 2018; Hogawood et al., 2017; Marshall-Pescini et al., 2019; Nagasawa et al., 2015; Odindaal, 2000; O'Haire, 2013). Additionally, humans generally view dogs as being nonjudgmental and having unconditional positive regard. Consequently, humans often experience a sense of comfort and support when interacting with dogs, especially during times of

increased stress or sadness (Chandler et al., 2010; Fine et al., 2018; Maharaja et al., 2016; Walsh, 2009).

The human-canine bond is an integral tenant of a successful relationship between a handler and their service dog and allows the individual to experience benefits in many aspects of their daily lives (Hicks & Weisman, 2015; Rodriquez et al., 2017; Walsh, 2009). For example, several studies revealed that individuals who own service dogs to assist them in completing activities of daily living experience the secondary benefit of increased independence, which positively impacts all areas of their lives (Carr et al., 2018; Crowe et al., 2014; Hall et al., 2017; Rintala et al., 2002; Thorne et al., 2017; Winkle et al., 2011). Additionally, because individuals who use service dogs experience increased independence, they are more likely to engage in community activities and have increased social interactions with others when compared to individuals with disabilities who do not use service dogs (Carr et al., 2018; Lundqvist et al., 2018; Rintala et al., 2002; Sanders, 2000; Yount et al., 2013). Individuals who use service dogs are also more likely to be employed and request less time off due to health-related issues than individuals who do not use service dogs (Groomes et al., 2014; Hall et al., 2017; Refson et al., 1999; Thorne et al., 2017). Finally, the numerous secondary benefits individuals who use service dogs experience increase their perceptions of their overall quality of life (Camp, 2001; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002; Rodriquez et al., 2019).

The individualized tasks service dogs can be trained to complete, along with the multiple secondary benefits they provide to their handlers, allow service dogs to be implemented with a number of specific populations, such as individuals with autism spectrum disorder and veterans (Hoagwood et al., 2017; O'Haire, 2013; Parenti et al., 2013; Rudstam et al., 2012; Yount et al.,

2013). Another population that service dogs also benefit are individuals with physical disabilities (Rintala et al., 2002; Rodriquez et al., 2019; Winkle et al., 2011).

People with physical disabilities face a number of unique barriers in their daily lives, such as discrimination, decreased sense of independence, and inaccessible spaces, that detrimentally impact various aspects of their lives, such as employment or social engagements (Chow et al., 2005; Dorstyn et al., 2011; Lumsdaine & Thurston, 2017; Nevala et al., 2015 Ochoa-Morales et al., 2019; Repke & Ipsen, 2019). In fact, research has shown that individuals with physical disabilities are less likely to be employed and report higher levels of social isolation than their peers without disabilities due to the barriers such as negative attitudes of others and inaccessibility (Chow et al., 2005; de la Vega et al., 2019; Lorefice et al., 2018; Lumsdaine & Thurston, 2017; Nevala et al., 2015; Shapiro & Martin, 2014). These results are significant given another segment of the literature showing that employment status and a sense of social connectedness are positively correlated to a one's perception of quality of life (de la Vega et al., 2019; Kim et al., 2014; Ochoa-Morales et al., 2019). Because individuals with physical disabilities face barriers in multiple aspects of their lives, an innovative, holistic intervention is needed to eliminate or reduce the barriers and increase overall quality of life.

One holistic intervention for individuals with physical disabilities is the use of service dogs. By assisting individuals with physical disabilities to perform tasks affected by functional limitations of their disabilities, service dogs can improve their handlers' independence and self-confidence, which, in turn, impacts other areas of their lives such as their engagement in social and occupational activities (ADA, 1990; Hall et al., 2017; Rintala et al., 2002; Rodriquez et al., 2019l Winkle et al., 2011). For individuals with physical disabilities, the secondary benefits of service dogs make service dogs a holistic intervention that can positively impact most aspects of

their lives and improve their overall quality of life (Rintala et al., 2002; Rodriquez et al., 2019; Winkle et al., 2011).

The aforementioned research demonstrates some of the benefits of service dogs for individuals with physical disabilities. The literature, however, is still limited (Hall et al., 2017; Rodriquez et al., 2019; Winkle et al., 2011) and focuses on specific subsets of the physical disability population. Additionally, a majority of the existing research has limitations due to small sample sizes and lack of diversity in participant demographics, indicating the need for additional research to further validate the use of service dogs as a holistic intervention for a broader range of individuals with physical disabilities.

The current study examined the impacts service dogs have on individuals with diverse physical disabilities regarding their activities of daily living, social connection, employment and quality of life. The value of this study lies in its contribution to the empirical understanding of the benefits of using service dogs as an intervention. As well, the study provided support for the use of service dogs to holistically address multiple barriers that individuals with physical disabilities face in their daily lives. The study, then, was designed to provide evidence of both the reliability and validity of the use of service dogs for individuals with physical disabilities and also provided sorely needed evidence and support for the increased use of service dogs to assist individuals with physical disabilities.

To examine the previously identified constructs, a cross-sectional survey research design for quantitative descriptive research was utilized. Participants were recruited from organizations that train and place service dogs with handlers. Participant inclusion criteria included individuals identified as having a physical disability and owning a service dog at the time of the study, as well as individuals with physical disabilities who were awaiting a service dog placement from

one of the organizations contacted. All participants completed an electronic survey, which included a demographic questionnaire, along with the Physical Self-maintenance Scale (Lawton & Brody, 1969), Patient-reported Outcomes Measurement Information System, or PROMIS, Ability to Participate in Social Activities adult short form (Cella et al., 2010), the PROMIS Social Isolation adult short form (Cella et al., 2010), the PROMIS Companionship adult short form (Cella et al., 2010), and the 16-item Flanagan Quality of Life Scale (Flanagan, 1982), to explore employment, independence in completing activities of daily living, social connectedness, and quality of life, respectively. The following definitions can be utilized to ground understanding of what is meant by the terms presented in the study.

## Definition of Terms

**Service Dog:** According to the Americans with Disabilities Act, or ADA, of 1990, a service dog is a canine that has been trained to assist with or complete a task for an individual diagnosed with a disability, where disability is defined as any condition that substantially limits one or more major life activity.

**Emotional Support Animal:** Emotional support animals are defined as any animal, regardless of species, that provides comfort to individuals (Mills & Yeager, 2012; Pierce, 2018).

**Human-canine Bond:** The human-canine bond is defined as the strong, universal emotional connection that humans share with dogs (Hicks & Weisman, 2015; Maharaj et al., 2018).

**Activities of Daily Living:** Activities of daily living describe six essential tasks individuals engage in everyday to maintain self-care: a) toileting, b) feeding, c) dressing, d) grooming, e) ambulation and f) bathing (Hicks & Weisman, 2015).

**Social Connection:** Social connection is defined as the sense of being close with others, which leads to feelings of being valued and cared for, and results in active engagement in relationships with others (Dunn & Brody, 2008).

**Employment:** Employment is defined as the ability to obtain and maintain paid work (Groomes et al., 2014).

**Quality of Life:** Quality of life can be defined as the unique experiences each person has regarding health, comfort, level of satisfaction in life, and perceptions about needs being met (Groomes et al., 2014; Hall et al., 2017).

**Physical Disability:** A physical disability is a condition that causes limitations for an individual's physical functioning, mobility, activities of daily living, dexterity, and/or endurance when combined with contextual factors, such as negative societal attitudes and inaccessibility (Dunn & Brody, 2008; Mackelprang & Salsgiver, 2016; Malik & Anton, 2013).

These terms will be discussed in further detail in the following sections.

## Literature Review

An examination of the literature regarding the use of service dogs reveals one clear theme: the terms used to discuss service dogs and emotional support animals have similar definitions and are therefore often used interchangeably, however incorrectly, by individuals in the community (Parenti et al., 2013; Winkle et al., 2011). Additionally, individuals who are unfamiliar with the correct definition of a service dog may be unclear regarding the legal rights of service dogs, as well as the etiquette for interacting with service dogs and their handlers in public (Thorne et al., 2017; Winkle et al., 2011). To assist in clarification of the terms, the researcher presents relevant literature that outline the rights and requirements of service dogs and

their handlers and compares and contrasts them to the rights and requirements afforded to emotional support animals.

**Service Dogs**

As stated previously, the Americans with Disabilities Act, or ADA, of 1990 defines a service animal as a canine that has been trained to assist or complete a task for an individual diagnosed with a disability, where disability is defined as any condition that substantially limits one or more major life activity. Based on the ADA (1990) definition, a service dog is regarded as an assistive device, not a pet, and specifies that canines are the only species that are considered to be service animals and receive protections under the law. The ADA (1990) also established some qualifications to ensure that service dogs are used to assist individuals with disabilities in mitigating functional limitations caused by their condition. For example, the ADA (1990) denotes that violence protection, crime deterrence, well-being, or companionship are unacceptable tasks under the definition of a service animal, as these behaviors are innate to canines and could potentially cause harm to the community (ADA, 1990; Mills & Yeager, 2012). The ADA (1990) also specifies that emotional support or comfort, which are also innate characteristics of dogs, do not qualify as a trained task and therefore, service animals must provide more than emotional support.

Receiving full protection under the ADA (1990), service dogs are afforded rights to ensure they are able to assist their handlers in all settings. Service animals are allowed in all public settings to assist their handlers in achieving the same access and equity as others in the community (Pierce, 2018). Even in establishments where animals are prohibited, service dogs have a legal right to enter and provide assistance to their handlers (ADA, 1990). The ADA (1990) also establishes qualifications for the individuals who receive legal protections while

using service dogs. According to the ADA (1990), individuals with documented disabilities are the only people who receive legal protection when using service dogs, such as the legal right to use service dogs in public areas in which dogs are typically not allowed. For individuals with documented disabilities who use service dogs, full legal protection is extended to them, allowing them to use their service dogs in all public settings (ADA, 1990).

The ADA (1990) originally specified that canines were the only recognized species that could be used as service animals and is the only species to receive protection under the ADA. Under the 2010 provisions to the ADA (1990), however, trained miniature horses were included as service animals and can be used as alternatives to service dogs, as they are beneficial for individuals with mobility or balance issues due to their ability to support more weight than dogs and tend to live longer than dogs so they can assist their handlers for longer periods of time (Mills & Yeager, 2012; US Department of Justice, 2010). Miniature horses that are used as service animals must be between 24 and 34 inches tall and weigh between 75 and 100 pounds (US Department of Justice, 2010). When using a miniature horse as a service animal in public, the handler must assess four factors: 1) if the horse is house broken, 2) if the horse can remain under control of the handler at all times, 3) if the public facility can accommodate the horses size and weight and 4) if the presence of the horse will disrupt the safety operations of the public facility (US Department of Justice, 2010). While miniature horses now receive legal protection as service animals, the vast majority of individuals with disabilities still use service dogs. The remainder of the literature reviewed focuses on the use of dogs as service animals.

The ADA (1990) similarly outlined conditions and regulations regarding service dogs. They specified that service dogs must be house broken, under control of the handler at all times, and harnessed or leashed at all times. The ADA (1990) did not, however, establish regulations

regarding size, weight, or breed of dogs used. While the ADA (1990) states that service dogs must be trained to meet a specific need of their handler, the law does not define the training requirements needed for a dog to become a service animal. For example, most service dogs require advanced training and certification to effectively assist their handler, however, a certificate of training is not legally required, and it is unlawful to ask for documentation of a service animal (Mills & Yeager, 2012; Parenti et al., 2013; Pierce, 2018).

In order to protect the rights and qualifications of individuals with disabilities as they use service dogs in their communities, the ADA (1990) outlines some qualifications for individuals permitted to utilize service dogs. In determining whether an animal qualifies as a service animal, public entities may not ask handlers about the nature of their disabilities, request documentation proving the status of the service animal, or charge a fee to access a public space, even if the public entity requires a fee for pet access (ADA, 1990; Mills & Yeager, 2012; Pierce, 2018). They may, however, ask if the animal is required because of a disability and what task the animal performs for the handler (ADA, 1990; McDonald, 2006).

Despite the provisions regarding service dogs established by the ADA (1990), the increased use of emotional support animals gives rise to questions and concerns regarding documentation, training, and etiquette when interacting with individuals who use service dogs in public (Pierce, 2018). This confusion undermines the purpose and benefits of service dogs and can lead to the development of stereotypes and stigmas when community members have limited understanding of service dogs and interact with working dogs who they assume are service dogs (Thorne et al., 2017; Parenti et al., 2013; Winkle et al., 2011). The following is a clarification of the rights, qualifications, and individuals who can use service dogs versus those of animals used as emotional support animals.

**Emotional Support Animals vs. Service Dogs**

People often confuse the definition and rights of service animals with the definition and rights of emotional support animals. Emotional support animals provide comfort to individuals but are not trained to perform a specific task for their handlers (Mills & Yeager, 2012; Pierce, 2018). Within the definition of a service dog, the ADA (1990) specifically states that providing comfort is not a qualified task, because it is innate to animals and is not a trained task.

A major differentiation between service dogs and emotional support animals is that emotional support animals can be any species, such as dogs, cats, or peacocks, whereas the only species that qualify as service animals are canines and miniature horses (ADA, 1990; Mills & Yeager, 2012). This difference contributes to the misunderstandings that occur regarding which animals qualify as service animals and can delegitimatize the use of service dogs for individuals with disabilities. Negative interactions between community members and emotional support animals, who are not held to the same legal and training standards as service dogs, can create stigmas and negative attitudes which can then create additional societal barriers for individuals with disabilities who use service dogs.

Because emotional support animals are not considered to be service dogs, they do not receive full legal protections in public (ADA, 1990; Horowitz, 2008). Under the Rehabilitation Act of 1973, however, emotional support animals are considered a reasonable accommodation for individuals with disabilities in the workplace. As such, emotional support animals receive some protections in the workplace, as long as the request for an emotional support animal as a reasonable accommodation is approved by the employer and does not cause a threat to the safety of others or place undue hardship on the employer (McDonald, 2006; Rehabilitation Act, 1973).

Additionally, emotional support animals receive protection under the Fair Housing Act of 2008. Under this law, emotional support animals can be maintained by individuals who live in housing that typically forbids pets and can travel on public transportation (Department of Housing and Urban Development, 2008). Finally, emotional support animals receive protections under the Air Carrier Access Act (1986) and are allowed to travel on airplanes with their handlers. Workplaces, housing, and air transportation settings, however, are the only public settings in which emotional support animals have legal protection (Department of Housing and Urban Development, 2008).

**Human-Canine Bond**

The human-canine bond is defined as the strong, universal emotional connection that humans share with dogs (Hicks & Weisman, 2015; Maharaj et al., 2018). As previously stated, dogs innately provide humans with a sense of emotional support and comfort (Chandler et al., 2010; Fine et al., 2018; Maharaja et al., 2016; Walsh, 2009). The connection humans feel towards dogs is universal, meaning that humans feel support and comfort with all dogs, regardless of their personal connection to a given dog, and this forms the basis for the companionship between humans and dogs (Beetz et al., 2011; Campo & Uchino, 2013; Chandler, 2018; Fine, 2018; Hogawood et al., 2017; Marshall-Pescini et al., 2019; Nagasawa et al., 2015; Odindaal, 2000; O'Haire, 2013). In an attempt to explain this phenomenon, scholars have cited the human-canine bond as the invisible force that connects humans and dogs, making interventions that incorporate canines so effective and a central tenant of a successful human-service dog partnership (Hicks & Weisman, 2015; Rodriquez et al., 2017; Walsh, 2009).

The human-canine bond is considered a mutually beneficial relationship, in which the canine's safety needs are met and the human's psychosocial, psychological, and physical needs

are met (Cohen, 2002; Corkran, 2015; LaFollette et al., 2019). Specifically, dogs provide humans with a sense of unconditional, nonjudgmental comfort, and safety, which creates a bond that fosters goal attainment when implemented as part of an intervention plan (Hicks & Weisman, 2015; Walsh, 2009). Research substantiates that the natural ability of dogs to evoke feelings of safety and comfort stems from the natural pack characteristics of dogs, which facilitates the establishment of a bond between humans and canines. (Maharaj et al., 2016). Because of their innate pack characteristics, dogs naturally desire to please and obey the alpha of the pack (Chandler, 2018, Power, 2008). Since humans provide dogs with food, shelter, and safety, while establishing guidelines for dogs to obey, most dogs view humans as the alpha of their pack (Maharaj et al., 2016).

**Benefits of the Human-Canine Bond**

Service dogs benefit individuals with disabilities by performing a primary task and the human-canine bond can provide individuals with additional physiological and psychological benefits (O'Haire & Rodriquez, 2018). Physiologically, research indicates that the human-canine bond immediately causes an increase an individual's levels of oxytocin (Marshall-Pescini et al., 2019; Nagasawa et al., 2015) and dopamine (Odindaal, 2000), while decreasing blood pressure (Odendaal, 2000) and cortisol levels (Beetz et al., 2011; Menna et al.,2019). These physiological benefits of the human-canine bond are immediate and easily identified through medical assessments, such as stress exams and cardiograms (House et al., 2018; Maharaj et al., 2018; Nagasawa et al., 2015; Odendaal, 2000). For example, Odendaal (2000) examined the beta-endorphin, oxytocin, prolactin, phenylacetic acid, dopamine, blood pressure, and cortisol levels of human (n=18) and canine study participants (n=18) after various types of human-canine interactions (e.g., interacting with their own dog, interacting with an unfamiliar dog, and

interacting with a dog in a reading program). Odendaal (2000) discovered that for both humans and canines, in all experimental groups, beta-endorphin, oxytocin, prolactin, phenylacetic acid, and dopamine significantly increased after the human-canine interactions. Both dogs and humans experienced positive physiological benefits from interacting with each other, demonstrating the mutual benefits of the bond (Odendaal, 2000). The study also demonstrated that human participants' cortisol levels significantly decreased after the interaction with a dog (Odendaal, 2000). The canine participants' cortisol levels did not significantly change, however, indicating that dogs positively impact humans' stress levels but that humans do not significantly impact the stress levels of dogs (Odendaal, 2000). Finally, results of this study indicated that the human participants' blood pressure levels significantly decreased within the first 20 minutes of interacting with canines (Odendaal, 2000). Odendaal's (2000) study demonstrated the fast-acting and mutually beneficial impact of the human-canine bond.

In addition to physiological benefits, several studies also demonstrate that the human-canine bond provides humans with psychological benefits (Chandler, 2018; Fine, 2018; Hogawood et al., 2017; House et al., 2018; O'Haire, 2013; Parshall, 2003; Stapleton, 2016; Walsh, 2009). The psychological benefits of the human-canine bond, however, are less easy to assess through the use of formal assessments and continue to be examined (Beetz et al., 2011; House et al., 2018; Parshall, 2003). There are a number of research studies that substantiate a variety of psychological benefits of the human-canine bond through outcomes such as reducing depression (Chandler et al., 2010; House et al., 2018; O'Callaghan & Chandler, 2011; O'Haire & Rodriguez, 2018), anxiety (Chandler, 2018; Chandler et al., 2010; O'Callaghan & Chandler, 2011; O'Haire & Rodriguez, 2018; Owenby, 2017), stress levels (Chandler, 2018; House et al., 2018; Odendaal, 2000; Owenby, 2017), problematic behaviors (O'Callaghan & Chandler, 2011;

O'Haire, 2013; Owenby, 2017; Stapleton, 2017), aggressiveness (O'Haire, 2013; Walsh, 2009), hyperactivity (O'Haire, 2013; Parshall, 2003) and distractibility (O'Haire, 2013; Parshall, 2003) in clients of various ages and presenting conditions.

For example, O'Haire and Rodriguez (2018) compared the perceived post-traumatic stress disorder and depression symptoms of veterans who used service dogs and were receiving treatment for negative symptoms of their disorder (n=75) with the perceived post-traumatic stress disorder and depression symptoms of veterans awaiting a service dog placement and were receiving treatment for negative symptoms of their disorder (n=66). They found that individuals who used service dogs reported significantly higher levels of perceptions of their therapeutic improvement when compared to the levels of therapeutic improvement reported by the waitlisted group (O'Haire & Rodriguez, 2018). Additionally, participants with service dogs reported lower levels of depression when compared with the depression levels of individuals awaiting a service dog placement, as measured by the Patient Health Questionnaire and Patient-Reported Outcomes Measurement Information System Depression adult short-form (O'Haire & Rodriguez, 2018). This study, along with others provide a supportive empirical bases for the psychological benefits of the human-canine bond.

As stated previously, the human-canine bond is considered to be universal. Humans view dogs as nonjudgmental and providing unconditional positive regard. These characteristics enable dogs to be desirable in counseling and therapeutic settings alongside interventions, such as roleplaying, to target specific behaviors (Chandler et al., 2010; Walsh, 2009). Chandler and colleagues (2010), Turner (2005), and Walsh (2009) all demonstrated that having a dog present when working on specific presenting problems in therapy created a sense of safety, comfort, and enhanced self-confidence for clients, which allowed them to feel more confident in their ability

to engage in change behaviors and reach their goals, while remaining present in the therapeutic setting. In a theoretical manuscript published by Chandler and colleagues (2010), literature regarding the benefits of animal-assisted therapy and the impact of animal-assisted therapy on the therapeutic relationship was reviewed. The results established the foundation to demonstrate how the uses and benefits of animal-assisted therapy align with the key tenants of theoretical counseling orientations (Chandler et al., 2010). Therefore, when animal-assisted therapy is utilized alongside nine various theoretical counseling orientations, the therapy animal facilitates the development of the therapeutic process and can enhance interventions to assist clients with achieving their therapeutic goals (Chandler et al., 2010). To assist individuals in reaching their therapeutic goals, canines can be implemented as interventions because the human-canine bond reduces many negative symptoms and creates a sense of safety and security for individuals (Chandler, 2018; Maharaj et al., 2018; Walsh, 2009).

A unique benefit of the human-canine bond is the sense of comfort and support individuals feel from their dogs during periods of stress or loss (Fine et al., 2018; Maharaj et al., 2016). In a study conducted by Maharaj and colleagues, (2016), participants (n=27) experiencing significant loss, like that of a family member or a job, reported that during the periods of loss, their dogs provided them with comfort and companionship. Additionally, participants indicated that they were motivated to continue providing their dog with a high quality of life, which, in turn, increased their own overall quality of life and decreased feelings of depression (Maharaj et al., 2018). Further, during stressful periods, research demonstrates that individuals rely on their dogs as a source of comfort and support, due to the natural physiological and psychological benefits of the human-canine bond (Maharaj et al., 2018; Fine et al, 2018). Individuals are better able to cope with the negative symptoms they experience during periods of stress or loss because

of the increased sense of security and companionship created through the human-canine bond (Crowe et al., 2018). The human-canine bond allows dogs to be used in a variety of settings and roles with diverse individuals to assist them in achieving both physiological and psychological outcomes.

## Benefits of Service Dogs

The human-canine bond is a central tenant of a successful relationship between an individual and their service dog (Hicks & Weisman, 2015; Rodriquez et al., 2017; Walsh, 2009). While service dogs' primary jobs are to perform unique tasks for individuals with disabilities, the human-canine bond also affords service dog users secondary benefits (O'Haire & Rodriquez, 2018). The relationship and connection developed between a service dog and their owner is proven to increase engagement in activities of daily living (Allen & Blascovich, 1996; Lane et al., 1998; Lundqvist et al., 2019; Rintala et al., 2008; Winkle et al., 2011), social connectedness (Carr et al., 2018; Lundqvist et al., 2018; Rintala et al., 2008; Sanders, 2000; Yount et al., 2013), occupational achievement (Groomes et al., 2014; Hall et al., 2017; Thorne et al., 2017), and overall quality of life (Camp, 2001; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002; Rodriquez et al., 2019).

### *Activities of Daily Living*

The term activities of daily living describe the six essential tasks individuals engage in everyday to maintain toileting, feeding, dressing, grooming, ambulation, and bathing (Hicks & Weisman, 2015). Many individuals with disabilities report difficulty in completing activities of daily living without assistance, whether the assistance is paid or unpaid (Allen & Blascovich, 1996; Lundqvist et al., 2019; Rodriquez et al., 2019). Service dogs are often trained to assist individuals with disabilities in completing activities of daily living, such as assisting during

wheelchair transfers or retrieving clothes for their handler (Crowe et al., 2014; Levey & Chappy, 2017; Rintala et al., 2008). By making activities of daily living easier for individuals to complete, the assistance of service dogs leads to individuals' increased sense of self-efficacy, self-esteem, and independence, as well as decreased reliance on others to complete daily activities (Hall et al., 2017; Lane et al., 1998; Rintala et al., 2008).

As individuals with service dogs increase their independence in completing activities of daily living, they also reduce their need for paid assistance, which, in turn, increases the economic benefits of having a service dog through the money saved (Allen & Blascovich, 1996; Lundqvist et al., 2019). Similarly, individuals with disabilities are often forced to rely on family members for assistance, which can place stress on familial relationships (Lundqvist et al., 2019; Thorne et al., 2017; Rodriquez et al., 2019). The increased levels of independence in completing activities of daily living promoted by using a service dog can improve family dynamics by reducing the need for assistance in everyday activities (Lane et al., 1998; Rintala et al., 2008; Winkle et al., 2011). In a study conducted by Lane and colleagues (1998), participants with physical disabilities (n=57) completed a survey to examine their motivations for acquiring service dogs, satisfaction with their service dogs and the changes that had occurred since receiving their service dog. Seventy percent of participants reported that their objective in acquiring a service dog was to increase their independence (Lane et al., 1998). As well, participants who sought a service dog for independence were significantly more satisfied with their service dogs' work than participants who were influenced by their support system to obtain a service dog (Lane et al., 1998). There is not much additional research regarding the impact of service dogs on individuals with disabilities' independent completion of activities of daily living.

There is a need, therefore, for additional research to provide empirical evidence that explores this construct.

### *Social Connection*

While service dogs may be trained to primarily assist their owner in completing activities of daily living, they also engender secondary benefits, such as increased independence, that can have positive impacts in a variety of life settings, such as community, social, and occupational environments (Carr et al., 2018; Crowe et al., 2014; Hall et al., 2017; Lane et al., 1998; Rintala et al., 2008; Winkle et al., 2011). Individuals with disabilities often experience challenges to participating in social and community events because of the physical demands and lack of accessibility in the community (Champagne et al., 2016). These challenges can result in decreased social connectedness (Champagne et al., 2016). Social connection is the sense of being close with others, which leads to feelings of being valued and cared for, and actively engaging in relationships with others (Dunn & Brody, 2008). Because of the primary benefits of service dogs, such as pulling a wheelchair or opening doors, and increased perceptions of self-efficacy and independence, individuals who employ service dogs are more likely to be engaged within their communities (Carr et al., 2018; Champagne et al., 2016; Crowe et al., 2014; Guest et al., 2006; Hicks & Weisman, 2015; McNicholas & Collis, 2000). For example, Carr and colleagues (2018) interviewed participants (n=12) who experienced chronic pain and owned a service dog. The purpose of the interviews was to explore the impact of service dogs on interviewees' wellbeing (Carr et al., 2018). One theme that emerged from the study was the impact service dogs had on participants' social connectedness (Carr et al., 2018). Participants reported that since receiving their service dogs, they were more likely to engage within the community and with others, such as talking to other people while taking their service dog to a dog park (Carr et al.,

2018). The results of this study indicate that owning a service dog can increase one's engagement in social activities and social connectedness (Carr et al., 2018).

While participating in community and leisure activities, such as taking their dog to the park or attending organizational events, people with service dogs are more likely to be approached, have positive social interactions, and successfully adapt to changes in social settings than individuals with disabilities that do not have a service dog (Carr et al., 2018; Guest et al., 2006; Lundqvist et al., 2018; Rintala et al., 2002; Sanders, 2000; Yount et al., 2013). Several studies found that when their service dog is present, individuals with disabilities report experiencing less social avoidance when engaging in their communities (Guest et al., 2006; Hall et al., 2017; McNicholas & Collis, 2000). Guest and colleagues (2006) study participants (n=51) completed three questionnaires at five different time periods to explore the longitudinal impact service dogs have on the social functioning of individuals with hearing impairments. The results of the study indicated a statistically significant difference in participants' social functioning and avoidance of social activities after receiving their service dogs, as measured by items on the Hearing Dog Questionnaire (Guest et al., 2006). This finding demonstrated individuals with service dogs are more likely to engage in social activities and less likely to avoid social interactions than individuals without service dogs (Guest et al., 2006). Because service dogs act as social lubricants, while encouraging and motivating their handlers to engage in leisure and community, individuals who utilized service dogs reported an overall increase in social functioning and connectedness (Crowe et al., 2018; Guest et al., 2006; Hall et al., 2017). The research regarding the social impact of service dogs, is limited to a few studies. More research is needed to empirically validate the effectiveness of service dogs in improving their handlers' social connectedness.

### *Employment*

Individuals with disabilities often face barriers within the area of employment, such as negative attitudes of employers and a lack of accessibility in the workplace (Glenn, 2013; Nevala et al., 2015). Employment is defined as one's ability to obtain and maintain paid work (Groomes et al., 2014). Research by Groomes and colleagues (2014) demonstrated that obtaining and maintaining employment is directly linked to an individual's positive perception of their overall life satisfaction. One factor that contributes to this phenomenon is the concept that employment creates social interaction, a support network and perceptions of success, which are all associated with increased perceptions of quality of life (Groomes et al., 2014; Refson et al., 1999).

According to the United States Department of Labor (2018), individuals with disabilities are less than half as likely to be employed than those without disabilities. The gap in employment rates may increase financial concerns for individuals with disabilities, which is compounded by the high costs of resources to address functional limitations, such as medical treatment or assistive devices (Barker et al., 2012; Rudstam et al., 2012; Thorne et al., 2017). While many interventions and strategies have been successfully implemented to improve employment outcomes for individuals with disabilities, service dogs have recently been found to increase employment rates for their owners when compared with people that do not use a service dog (Groomes et al., 2014; Hall et al., 2017).

In addition to the increased psychosocial and economic security for employed individuals with disabilities, using a service dog has also been associated with improved general health and physical activity, resulting in reduced workplace absenteeism due to health-related issues (Refson et al., 1999; Thorne et al., 2017). Using a service dog in the workplace can also increase the individual's sense of safety and relaxation, resulting in decreased stress levels, leading to

more positive interactions with coworkers and an overall more positive work environment (Crowe et al., 2014; Thorne et al., 2017; Yount et al., 2013). Just by having a service dog present in the workplace, all employees can experience the benefits of the human-canine bond and senses of community and belongingness can be fostered (Glenn, 2013; Thorne et al., 2017).

Despite all of the benefits to individuals with disabilities and the workplace, negative employer perceptions of service dogs still exist, such as concerns about allergies, disruption, fear of dogs and liability (Glenn, 2013). Glenn (2013) highlights the need for employees with service dogs to be prepared to engage in conversations with employers regarding the employer's questions about their dogs by knowing their legal rights and responsibilities as a service dog owner and having the self-advocacy skills to effectively communicate their needs and rights. By understanding their rights and responsibilities as service dog owners, individuals with disabilities can advocate for reasonable accommodations that positively impacts their productivity and the workplace (Glenn, 2013). Like the other secondary benefits discussed previously, there are only a handful of studies that examine the impact service dogs have on their handlers' employment. Additional research is necessary to examine the impact service dogs have within the construct of employment for individuals with disabilities.

### *Quality of Life*

The secondary benefits of service dogs positively impact almost every aspect of a person's life resulting in the increased perception of their quality of their life (Camp, 2001; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002; Rodriquez et al., 2019). Quality of life can be defined as the unique experiences each person has regarding health, comfort, level of satisfaction in life, and perception about needs being met (Groomes et al., 2014; Hall et al., 2017). Many components contribute to an individual's perception of their quality of life, such as

mental and physical health, level of independence, social connection, involvement in leisure activities, and occupational achievement (Hall et al., 2017; McIver et al., 2020). For individuals with disabilities, the disability itself may not directly lower their perception of the quality of their lives (Carr et al., 2018; McIver et al., 2020). Rather, lowered self-efficacy, feelings of dependence, and perceptions of the lack of occupational and social achievements may negatively impact an individual's overall discernment of their quality of life, self-worth, and life purpose (Carr et al., 2018; McIver et al., 2020).

Service dogs, however, have been found to increase independence in activities of daily living, social connectedness and occupational achievement, thus also improving their handlers' overall quality of life (Camp, 2001; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002; Rodriquez et al., 2019). Hall and colleagues (2017) explored the quality of life of individuals with physical disabilities, using the 16-item Flanagan Quality of Life Scale. The research study compared the Flanagan Quality of Life Scale for individuals with physical disabilities who used physical service dogs (n=72) and individuals with physical disabilities who were awaiting a physical service dogs (n=24) with the scores of individuals with hearing service dogs (n=111) and individuals with hearing loss awaiting hearing service dogs (n=30) (Hall et al., 2017). The study found that individuals with physical and hearing disabilities who owned service dogs rated their overall quality of life, general health, employment, learning, and independence significantly higher than those who did not yet own service dogs (Hall et al., 2017). Additionally, individuals with physical disabilities reported statistically significant higher satisfaction ratings regarding recreational activities, social interactions and self-awareness, when compared to individuals awaiting service dogs or individuals with hearing service dogs. Moreover, service dogs provide their owners with a variety of secondary benefits that improve mental, physical, social, and

occupational functioning that can lead to improved overall quality of life (Camp, 2001; Carr et al., 2018; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002). While some research exists regarding the impact service dogs have on their handlers' quality of life, this research is scarce, and the limitations of these studies indicate the need for additional research exploration and discovery to further validate the use of service dogs as a holistic intervention for individuals with disabilities.

**Use of Service Dogs for Individuals with Physical Disabilities**

For individuals with physical disabilities, service dogs can serve as a holistic intervention to address many of the barriers they face in their everyday lives (Canine Companions for Independence, 2020; Paws with a Cause, 2020). The tasks service dogs perform for individuals with disabilities are diverse, making service dogs an individualized intervention for individuals with physical disabilities. They include opening and closing doors, cabinets, drawers, etc., retrieving items, pulling a wheelchair, alerting a caretaker of medical emergencies, alerting a person with diabetes to changes in blood sugar levels, reducing the duration of seizures, assisting with transfers, assisting with making the bed, counterbalancing, assisting with orientation and mobility, alerting to noises in the environment, along with many others (Canine Companions for Independence, 2020; Paws with a Cause, 2020). Because dogs can be trained to perform tasks that meet a wide range of needs, many disability populations could potentially benefit from the use of service dogs. Research regarding the benefits of service dogs has largely been done to support their use for specific populations, such as individuals with autism spectrum disorder (O'Haire, 2013), individuals with hearing impairments (Guest et al., 2006; Hall et al., 2017; Lundqvist et al., 2018), and individuals with posttraumatic stress disorder (LaFollette et al., 2019; Thorne et al., 2017; Yount et al., 2013). Very little research exists regarding the benefits of

service dogs for individuals with physical disabilities, however, highlighting the need to further validate the use of service dogs as a holistic intervention for individuals with a wider range of physical disabilities (Hall et al, 2017; Rodriquez et al., 2019; Winkle et al., 2011).

A physical disability is a condition that causes functional limitations for an individual's physical functioning, mobility, activities of daily living, dexterity, and/or endurance when combined with contextual factors, such as negative societal attitudes and inaccessibility (Dunn & Brody, 2008). Physical disabilities fall into one of two categories: a) congenital, which occurs when a person is born with a physical disability; or b) acquired, which occurs when a person is diagnosed with a physical disability following a physically traumatic event, infection, or disease (Mackelprang & Salsgiver, 2016; Malik & Anton, 2013). Examples of physical disabilities include but are not limited to multiple sclerosis, spina bifida, spinal cord injuries, amputation, cerebral palsy, muscular dystrophy, hearing impairment, visual impairment, epilepsy, arthritis, and brain injury (Mackelprang & Salsgiver, 2016).

While the causes of physical disabilities are varied, acquiring a physical disability is considered a life stressor and a major life adjustment, due to the number of systemic barriers and oppression individuals with physical disabilities face in their daily life (Chow et al., 2005; Dorstyn et al., 2011; Lumsdaine & Thurston, 2017; Nevala et al., 2015 Ochoa-Morales et al., 2019; Repke & Ipsen, 2019). Because physical disabilities can be acquired at any point in a person's life, such as a traumatic brain injury or a spinal cord injury, research indicates that acquiring a disability is associated with a decreased sense of independence, especially in the completion of activities of daily living (Branch & Van Swearingen, 2002). For example, individuals with disabilities may require assistance in completing activities of daily living, which potentially impact their engagement in employment, social, and academic activities. In a study

conducted by Mlynaryk and colleagues (2017), participants (n=15), who consisted of students with physical disabilities, their parents, and potential employers, reported that a major barrier to employment was the students' need for assistance on the job to complete activities of daily living due to the perceived costly expense of hiring assistance on the part of the employer. The need for assistance in completing activities of daily living creates a sense of dependency and poses limitations on an individual's engagement in social and employment activities (Bogart et al., 2019; Dorstyn et al., 2011; Goldberg et al., 2019).

Additionally, the barriers that individuals with physical disabilities face, such as a lack of transportation options, inaccessible spaces, or negative perceptions of employers, are linked to lower levels of employment rates, especially when compared to the employment rates of their peers without disabilities (Chow et al., 2005; de Almeida et al., 2019; Grise et al., 2019; Lorefice et al., 2018; Nevala et al., 2015; Repke & Ipsen, 2019; Sevack et al., 2015). Within the workplace, many individuals with physical disabilities require reasonable accommodations to complete essential job functions (Lorefice et al., 2018; Nevala et al., 2015). As outlined by the ADA (1990), employers are required to provide qualified employees or prospective employees with assistance or adaptations to a workspace or function, unless the accommodation creates undo hardships for the employer, such as substantial expenses. For individuals with physical disabilities, work accommodations are most successful when the employer is positive, supportive, and has open communication, as well as when the costs of the accommodation are minimal to the employer (Nevala et al., 2015). Barriers individuals with physical disabilities often face when attempting to implement reasonable accommodations in the workplace include the employers' lack of understanding and knowledge regarding the accommodations needed and willingness to collaborate with the individuals to identify necessary accommodations (Nevala et

al., 2015). Because individuals with disabilities continue to face barriers regarding reasonable accommodations and access to employment, an innovative intervention is required to holistically address the employment gap.

The barriers individuals with physical disabilities face in the workplace are also seen within the construct of social connectedness, such as inaccessibility and negative attitudes of peers. Individuals with physical disabilities report higher levels of social isolation and negative psychosocial symptoms, such as depression and anxiety (de la Vega et al., 2019; Lumsdaine & Thurston, 2017; Office of National Statistics, 2015; Shapiro & Martin, 2014; WHO, 2020). For example, in a study conducted by Lumsdaine and Thurstone (2017), individuals with physical disabilities (n=10) reported difficulty maintaining friendships, partially due to the negative perceptions of disabilities held by their peers and inaccessibility of spaces in which they could interact with their peers. Additionally, participants indicated they avoided engaging in the community due to the perceptions community members held regarding individuals with disabilities and negative interactions with community members, which result in lowered self-esteem and feelings of being objects of pity (Lumsdaine & Thurston, 2017). Because social connectedness impacts an individual's mental wellbeing, additional interventions are needed to address the barriers individuals with physical disabilities face in the community to increase their engagement in social activities and social supports.

For individuals with physical disabilities, social connectedness, which includes relationships with others, engagement in social activities, and the perception belonginess and maintaining employment are positively correlated with overall perception of their quality of life (de la Vega et al., 2019; Kim et al., 2014; Ochoa-Morales et al., 2019). Individuals with physical disabilities, however, report a lower quality of life, often due to the isolation and other barriers

they face, indicating there is an interconnection between employment status, social connectedness and perceived quality of life (Lumsdaine & Thurston, 2017; Ochoa-Morales et al., 2019). For example, in a study conducted by Lorefice and colleagues (2018), participants with multiple sclerosis (n=123) reported that losing employment caused negative psychological symptoms, which, in turn, caused them to withdraw from social and leisure activities and report lower levels of satisfaction in their quality of life. Because quality of life is determined by one's perception of other facets of their life, such as employment status, social supports, or independence, holistic interventions are needed to address the multifaceted aspects of quality of life and address the barriers individuals with physical disabilities face.

## Significance of the Study

One intervention to holistically improve outcomes for individuals with physical disabilities is the use of service dogs. Service dogs are a unique intervention for people with physical disabilities, as other interventions often target only one aspect of an individual's life, such as vocational rehabilitation counseling or independent living skills training. Service dogs have the potential to impact multiple facets of handlers' lives. Research demonstrates that individuals with physical disabilities who owned service dogs rated their overall quality of life, life satisfaction, positive mental health symptoms, self-esteem, social connection, and workplace engagement higher than those who did not own service dogs (Rintala et al., 2002; Rodriquez et al., 2019; Winkle et al., 2011). Rintala and colleagues (2002) conducted a mixed methods study to identify the perceived holistic benefits, limitations, and satisfaction individuals with mobility impairments held regarding their service dogs. In the study, the researchers partnered with the Texas Hearing and Service Dogs organization to recruit participants (n=21), all diagnosed with a mobility impairment and on the waiting list to receive a service dog (Rintala et al., 2002). Phone

interviews and mailed surveys, which included demographic and disability information, questions regarding expected and actual effects of a service dog and the Rosenberg Self-esteem Scale, were completed by participants upon acceptance into the study, prior to being partnered with a service dog, and at six, 12 and 24 months after receiving the service dog (Rintala et al., 2002). Upon analysis of the data, Rintala and colleagues (2002) found that individuals with service dogs engaged in more social interactions and experienced higher levels of independence and safety after being partnered with their service dog. Additionally, individuals with service dogs reported higher levels of self-esteem and less reliance on paid and unpaid assistance after receiving their service dog (Rintala et al., 2002). While some negative aspects of having a service dogs were identified, such as the expense of owning a dog, other's negative perceptions of service dogs and inconvenience of caring for the dog, participants indicated that the benefits of being partnered with a service dog outweighed the long application process to receive a service dog and any negative aspects of having a service dog (Rintala et al., 2002).

While some research exists supporting the positive impact of service dogs for people with physical disabilities, there are only a handful of empirical studies that elucidate the impact of service dogs on activities of daily living, employment, social connectedness, and quality of life for individuals with physical disabilities (Rintala et al., 2002; Rodriquez & O'Haire, 2019; Winkle et al., 2011). Individuals with physical disabilities face a unique set of challenges, such as identity negotiation, experiences of loss in multiple facets of life, and reduced social connections (Dunn & Brody, 2008). The secondary benefits of service dogs potentially alleviate the psychosocial challenges people with physical disabilities face, such as isolation, loss of independence, increased financial expenses, and decreased quality of life, therefore, research regarding the intricacies of benefits of service dogs should be conducted (Chandler et al., 2010;

Turner, 2005; Walsh, 2009). The limited literature regarding the benefits of service dogs indicates the need for additional research to be conducted to further explore the holistic impact service dogs have on their handlers' lives (Hall et al., 2017; Rodriquez et al., 2019; Winkle et al., 2011). Additionally, a majority of the existing research has limitations of small sample sizes and lack of diversity in participant demographics, indicating a need for additional research to be conducted to further validate the use of service dogs as a holistic intervention for individuals with physical disabilities. The aim of the current study was to explore the impacts service dogs have on individuals with diverse physical disabilities on their activities of daily living, social connection, employment and quality of life.

## Hypotheses

The following hypotheses were based on the review of the literature and provide the bases upon which the study research questions have been considered.

$H^0$: Individuals with physical disabilities that use a service dog will not report higher levels of independence in completing activities of daily living (as measured by the Physical Self-Maintenance Scale) when compared with the general public.

$H^1$: Individuals with physical disabilities that use a service dog will report higher levels of independence in completing activities of daily living (as measured by the Physical Self-Maintenance Scale) when compared with the general public.

$H^0$: There is no relationship between people with physical disabilities independence in completing activities of daily living (as measured by the Physical Self-Maintenance Scale) and length of service dog ownership.

$H^2$: There is a relationship between people with physical disabilities independence in completing activities of daily living (as measured by the Physical Self-Maintenance Scale) and length of service dog ownership.

$H^0$: Individuals with physical disabilities that use a service dog will not report higher levels of social connectedness (as measured by the PROMIS Ability to Participate in Social Activities adult short form, the PROMIS Social Isolation adult short form and the PROMIS Companionship adult short form) when compared with general public.

$H^3$: Individuals with physical disabilities that use a service dog will report higher levels of social connectedness (as measured by the PROMIS Ability to Participate in Social Activities adult short form, the PROMIS Social Isolation adult short form and the PROMIS Companionship adult short form) when compared with general public.

$H^0$: There is no relationship between people with physical disabilities social connectedness (as measured by the PROMIS Ability to Participate in Social Activities adult short form, the PROMIS Social Isolation adult short form and the PROMIS Companionship adult short form) and length of service dog ownership.

$H^4$: There is a relationship between people with physical disabilities social connectedness (as measured by the PROMIS Ability to Participate in Social Activities adult short form, the PROMIS Social Isolation adult short form and the PROMIS Companionship adult short form) and length of service dog ownership.

$H^0$: Individuals' with physical disabilities that use a service dog will not report higher employment satisfaction and length of employment (as measured by the demographic information analysis) when compared with the general public.

$H^5$: Individuals' with physical disabilities that use a service dog will report higher employment satisfaction and length of employment (as measured by the demographic information analysis) when compared with the general public.

$H^0$: There is no relationship between people with physical disabilities employment satisfaction and length of employment (as measured by the demographic information analysis) and length of service dog ownership.

$H^6$: There is a relationship between people with physical disabilities employment satisfaction and length of employment (as measured by the demographic information analysis) and length of service dog ownership.

$H^0$: Individuals' with physical disabilities that use a service dog will not report higher ratings of quality of life (as measured by the 16-item Flanagan QOLS) when compared with the general public.

$H^7$: Individuals' with physical disabilities that use a service dog will report higher ratings of quality of life rating (as measured by the 16-item Flanagan QOLS) when compared with the general public.

$H^0$: There is no relationship between people with physical disabilities quality of life (as measured by the 16-item Flanagan QOLS) and length of service dog ownership.

$H^8$: There is a relationship between people with physical disabilities quality of life (as measured by the 16-item Flanagan QOLS) and length of service dog ownership.

## Summary

The use of service dogs as a holistic intervention has continued to rise in the United States due to the multiple benefits service dogs provide to individuals with diverse disabilities (Muramatsu et al., 2015; Trainer, 2016). In addition to being trained to perform a task that

mitigates some of the functional limitations caused by their handlers' disability, service dogs also provide their handlers with a number of secondary benefits due to the human-canine bond, such as decreased negative psychological and physiological symptoms (Chandler, 2018; Fine, 2018; Hogawood et al., 2017; House et al., 2018; O'Haire, 2013; Parshall, 2003; Stapleton, 2016; Walsh, 2009), improved performance of activities of daily living (Crowe et al., 2014; Hall et al., 2017; Levey & Chappy, 2017; Rintala et al., 2002), increased rates of employment (Crowe et al., 2014; Thorne et al., 2017; Yount et al., 2013), greater social connectedness (Champagne et al., 2016; Crowe et al., 2014; Guest et al., 2006; Hicks & Weisman, 2015; McNicholas & Collis, 2000), and improved self-perceptions of quality of life (Camp, 2001; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002; Rodriquez et al., 2019). In Chapter I, definitions to ground understanding of the terms used in the study were presented. Literature regarding the legal rights and qualifications of service dogs, the benefits of the human-canine bond, the impact of service dogs on individuals' activities of daily living, social connectedness, employment and quality of life, and the benefits of service dogs for individuals with physical disabilities were reviewed.

The literature reviewed indicated confusion exists regarding the rights and qualifications of service dogs and the individuals who can use service dogs, especially when compared to the rights and qualifications of emotional support animals (Parenti et al., 2013; Winkle et al., 2011). This confusion results from limited research and community knowledge regarding service dogs (Parenti et al., 2013; Winkle et al., 2011). There is a need to increase the empirical evidence supporting the use of service dogs as an intervention, which, in turn, can increase the community's understanding of their rights and benefits.

The reviewed literature regarding the human-canine bond clearly substantiates that the bond is a central tenant of a successful handler-service dog relationship (Hicks & Weisman,

2015; Rodriquez et al., 2017; Walsh, 2009). The human-canine bond is formed due to innate characteristics of dogs and universal sense of comfort and support humans feel when interacting with dogs (Chandler, 2018; Fine et al., 2018; Maharaj et al., 2016; Walsh, 2009). This bond is imperative for an individual with a disability to experience the secondary benefits of owning a service dog (Carr et al., 2018; Chandler et al., 2010; Crowe et al., 2014; Hall et al., 2017; Hicks & Weisman, 2015; Rintala et al., 2002; Rodriquez et al., 2017; Walsh, 2009).

The reviewed literature also points to the fact that service dogs provide their handlers with disabilities with a number of secondary benefits that positively impact multiple facets of their lives, such as independence in completing activities of daily living (Crowe et al., 2014; Hall et al., 2017; Levey & Chappy, 2017; Rintala et al., 2002), opportunities and achievement in employment (Crowe et al., 2014; Thorne et al., 2017; Yount et al., 2013), increased social connectedness (Champagne et al., 2016; Crowe et al., 2014; Guest et al., 2006; Hicks & Weisman, 2015; McNicholas & Collis, 2000), and improved perceptions of quality of life (Camp, 2001; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002; Rodriquez et al., 2019). Again, however, the empirical research regarding these benefits is limited and often focuses on only one construct.

The literature regarding the benefits of service dogs for individuals with specific populations reveals that service dogs are proven to provide benefits for individuals with diverse disabilities due to their ability to be trained to meet the individualized needs of their handlers and secondary benefits that impact many other aspects of their lives (Canine Companions for Independence, 2020; Chandler, 2018; Hicks & Weisman, 2015; Maharaj et al., 2016; Paws with a Cause, 2020). For individuals with physical disabilities, service dogs can address many of the barriers they face in their daily lives, but especially within the areas of activities of daily living

(Winkle et al., 2011), social connectedness (Rodriquez et al., 2019), employment (Winkle et al., 2011), and quality of life (Hall et al., 2017). Again, this research is limited and typically focuses on one population that is classified under the umbrella term physical disability, instead of exploring the benefits for the population of individuals with disabilities as a whole. Additional research is required to extends findings more broadly into the population.

Chapter II describes the quantitative research methodology and research questions for the study. The chapter also provides information about participant recruitment, data collection methods, data analysis procedures, and explains a theoretical basis for the overall research process.

## Chapter II. Methodology

As previously stated, service dogs have the potential to impact many aspects of the lives of individuals with disabilities, such as activities of daily living (Crowe et al., 2014; Hall et al., 2017; Levey & Chappy, 2017; Rintala et al., 2002), employment (Crowe et al., 2014; Thorne et al., 2017; Yount et al., 2013), social connectedness (Champagne et al., 2016; Crowe et al., 2014; Guest et al., 2006; Hicks & Weisman, 2015; McNicholas & Collis, 2000), and quality of life (Camp, 2001; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002; Rodriquez et al., 2019). Research regarding the benefits of service dogs as a holistic intervention for individuals with physical disabilities, however, is limited (Hall et al., 2017; Rodriquez et al., 2019; Winkle et al., 2011). The aim of the current study was to empirically examine the impact service dogs have on individuals with physical disabilities regarding their activities of daily living, social connection, employment, and quality of life. To further examine these constructs, the following research questions were empirically addressed using a cross-sectional survey research design:

1. How does people with physical disabilities who own service dogs compare with the general public regarding their independence in completing activities of daily living?
2. Does more time owning a service dog increase people with physical disabilities independence in completing actives of daily living?
3. How does people with physical disabilities who own service dogs compare with the general public regarding their social connectedness?
4. Does more time owning a service dog increase people with physical disabilities social connectedness?
5. How does people with physical disabilities who own service dogs compare with the general public regarding their length of employment and employment satisfaction?

6. Does more time owning a service dog increase people with physical disabilities length of employment and employment satisfaction?
7. How does people with physical disabilities who own service dogs compare with the general public regarding their quality of life?
8. Does more time owning a service dog increase people with physical disabilities quality of life?

## Research Design

A cross-sectional survey research design for quantitative research was used to examine the impact of owning a service dog on the activities of daily living, social connectedness, employment, and quality of life for individuals with physical disabilities. The cross-sectional survey research design allowed the researcher to examine multiple variables at a single point in time, does not require manipulation of the variables and is typically used to estimate the outcomes of identified variables (Levin, 2006). By using a cross-sectional survey research design as opposed to other research designs, the four constructs (e.g., activities of daily living, social connectedness, employment, and quality of life) were examined at a specific point in time to accurately capture participants' current experiences with service dogs in relation to the four constructs.

Data collection occurred using an online survey that was published on Qualtrics, which is designed to securely store collected data. Using an electronic survey format allowed for greater distribution of the questionnaire, which, in turn, increased the diversity of participants (Jones et al., 2013; Ponto, 2015). Additionally, the use of an electronic survey allowed data to be collected in a relatively short period of time, as participants had instant access to the study upon providing consent (Jones et al., 2013; Ponto, 2015). The survey was distributed to organizations across the

United States that train and place service dogs with individuals with physical disabilities. The nationwide scope of survey distribution increased the probability of more diverse participant demographics (e.g., location, ethnicity, race, physical disability, etc.) and allowed for greater generalizability of the findings. Participants had the option to enter into a raffle for their contribution to the study in an effort to promote recruitment and incentivize study participation (Singer & Couper, 2009; Zutlevics, 2016).

**Participant Characteristics**

Individuals were eligible to participate in the study if they (a) were at least 19 years old, (b) were able to read English, (c) had internet access, (d) had been diagnosed with a physical disability, and (e) owned a service dog or were on a waiting list to receive a service dog. Based on the definitions of a physical disability, examples of physical disabilities, for the purpose of this study, included arthritis, brain injury, cerebral palsy, dwarfism, epilepsy, hearing impairment, multiple sclerosis, muscular dystrophy, spina bifida, spinal cord injury, visual impairment, and other physical disabilities, as determined by the researcher. Participants in the study consisted of one group: individuals with one or more physical disabilities that use a service dog. Eligible participants assisted in answering the previously stated research questions by providing quantitative information regarding the four constructs of the current study.

**Sampling and Procedures**

Recruitment of participants occurred between February 2021 and January 2022. Participants were recruited from databases hosted by organizations across the United States that provide service dogs for individuals with physical disabilities (see contact list of organizations in Appendix A). The researcher sent service dog organizations a recruitment email that was subsequently distributed to individuals in their databases upon organizations agreeing to send the

study to their constituents by completing the Institutional Review Board, or IRB, approved site authorization letter. The recruitment email contained information regarding participant eligibility, an overview of the study, the researcher's contact information, and a link to the survey, which was hosted through Qualtrics.

A self-selection sampling technique was utilized in the study. Participants consented to participate in the study based on their own identification of meeting the inclusion criteria (Lundqvist et al., 2018; Lundqvist et al., 2019). All participants in the study provided consent to participation before the start of the study, as outlined by the IRB. Informed consent documentation was the first page of the electronic survey and consent was required from all participants to grant them access to the survey (see Appendix B for a copy of the survey, which contains the informed consent documentation). The informed consent document included an overview of potential participants' responsibilities, potential risks and benefits of participating in the study, costs required to participate in the study, and the researcher's contact information (Robinson III & Curry, 2008; Skarbek et al., 2006). Additionally, the informed consent document emphasized the voluntary nature of participating in the study and the anonymity and confidentiality of information collected (Robinson III & Curry, 2008; Skarbek et al., 2006).

Participants did not receive compensation for their time, but rather were provided a link to enter a random drawing to receive one of five $50 electronic Amazon gift cards (see Appendix C for a copy of the raffle survey). Information acquired from the raffle was stored separately and securely, as to not breach the confidentiality of identifying information, but still enabled the researcher to send gift cards electronically to the winners. Specifically, participants interested in entering the raffle completed another survey, which was also hosted by Qualtrics. A link to enter the raffle was provided to participants at the completion of the study survey. Information

gathered from participants entered in the raffle included full name and email address, so the researcher was able to contact raffle winners and provide them with their awards. Each participant entered in the raffle was assigned a number. A random number generator provided the researcher with five numbers and the participants who correspond with the selected numbers each received one gift card. All identifying information gathered through the raffle survey was securely stored in a BOX folder, which employs double encryption security and will be permanently deleted one year after the completion of the study.

**Sample Size and Power**

It was originally estimated that the current study would have a large effect size, with a power level of 0.8 and alpha level of p=0.05 (Cohen, 1992). The intended sample size of this study was originally estimated to be 27 participants, as calculated by G*Power. With a sample size of 27 participants, a one-tailed, one sample t-test would have an actual power of 0.812, according to G*Power. This power estimation was also given the assumptions that the variables are continuous (e.g., Likert scale), the data are independent, there are no significant outliers amongst data sets and there are normal distributions of scores.

Due to the low response rate, however, the study was adapted as a preliminary pilot study. Pilot studies are beneficial in research because they allow researchers to assess recruitment strategies, data collection methods and protocols with a smaller sample size before engaging in a lager study (Hassan et al., 2006; In, 2017). Additionally, pilot studies allow researchers to identify limitations in their research design, methods and instruments, as well as make adaptations for improvement before conducting the full study (Hassan et al., 2006). In essence, pilot studies provide researchers with the information necessary to understand if

conducting a large-scale study will be feasible, as well as understand and address potential limitations and challenges of a future study.

When conducting a pilot study, researchers must exercise judgement in determining the appropriate sample size to evaluate multiple factors such as feasibility, the aim of the study and data analysis methods (Moore et al., 2011; Whitehead et al., 2016). Research does indicate, however, that a sample size of at least 12 participants is not only practical for conducting a pilot study, but also typically yields valuable results, especially when using continuous variable (Moore et al., 2011; Whitehead). Based on this information, the present pilot study aimed to have a sample size of at least 12 participants.

Sixteen survey responses (n=16) were received, exceeding the targeted sample size. One survey response was excluded from data analysis due to the participant not meeting the inclusion criteria of having a physical disability. This resulted in a sample size of 15 (n=15). For the Physical Self-maintenance Scale, a moderate effect size of d=0.58 was observed and for sample size of n=15 with an alpha level of p=0.05, the power, as calculated by G*Power, is 0.69. This indicates that there is 69 percent chance that a statistically significant result will be observed for the instrument. For the 16-item Flanagan Quality of Life Scale, a small effect size of d=0.36 was observed and for a sample size of n=15 with an alpha level of p=0.05, the power, as calculated by G*Power, is 0.38. This indicates that there is 38 percent chance that a statistically significant result will be observed for the instrument. For the Patient-reported Outcomes Measurement Information System, or PROMIS, Ability to Participate in Social Activities adult short form, an effect size larger than one standard deviation was observed (d=1.03) and for a sample size of n=15 with an alpha level of p=0.05, the power, as calculated by G*Power, is 0.98. This indicates that there is 98 percent chance that a statistically significant result will be observed for the

instrument. For the PROMIS Social Isolation adult short form, a moderate effect size of d=0.52 was observed and for a sample size of n=15 with an alpha level of p=0.05, the power, as calculated by G*Power, is 0.61. This indicates that there is a 61 percent change that a statistically significant result will be observed for the instrument. Finally, for the PROMIS Companionship adult short form, a small effect size of d=0.32 was observed and for a sample size of n=15 with an alpha level of p=0.05, the power, as calculated by G*Power, is 0.32. This indicates that there is a 32 percent chance that a statistically significant result will be observed for the instrument.

## Measures

After consenting to participate in the study, participants completed a demographic questionnaire. Demographic information collected from all participants included age, gender, ethnicity, race, geographic location, highest level of education completed, relationship status, disability status, employment status and if employed, satisfaction with employment, and length of time at place of employment. Participants were also asked if they currently owned a service dog and if so, for how long. Finally, participants were asked the amount of time they had been on a waiting list to receive a service dog. Survey responses were statistically compared to examine the impact owning a service dog has on each of the four constructs of the study (e.g., activities of daily living, social connectedness, employment, and quality of life).

Participants also completed various instruments that assessed the variables examined in this study. The Physical Self-maintenance Scale, or PSMS (Lawton & Brody, 1969), the 16-item Flanagan Quality of Life Scale, or QOLS (Flanagan, 1982), and three PROMIS, assessments, the PROMIS Ability to Participate in Social Activities adult short form (Cella et al., 2010), the PROMIS Social Isolation adult short form (Cella et al., 2010), and the PROMIS Companionship adult short form (Cella et al., 2010) were administered to participants via Qualtrics (see

Appendix B for a copy of the survey). Each of the measures utilized in the study are accessible online at no cost. The psychometric information for each measure was also available online. The data collected with these measures was used to provide descriptive information about participants and was analyzed to explore the effects of service dog ownership on the variables of activities of daily living, social connectedness employment, and quality of life for individuals with physical disabilities.

**Physical Self-maintenance Scale**

The Physical Self-maintenance Scale Self-Report, or PSMS-Self, developed by Lawton and Brody (1969), was used to measure participants' independence in completing activities of daily living. The PSMS-Self consists of a self-report, eight-item measure used to assess six activities of daily living (i.e., toileting, feeding, dressing, grooming, ambulation, and bathing). Each of the items consists of a three-point response scale that includes statements regarding the respondent's level of independence for each activity of daily living, ranging from total independence to total dependence (i.e., "without any help or aid," "does someone feed you?") (Lawton & Brody, 1969). Based on the response, a number of one or zero is assigned to the item for scoring, where a score of one is assigned to total independence for an item (i.e., 1 = totally independent, 0 = partially or totally dependent). Scores on the assessment range from six, which indicates total independence, to zero, which indicates total dependence.

The PSMS-Self was originally developed to assess independence in completing activities of daily living of individuals with disabilities aged 65 or older. To the knowledge of the researcher, a study utilizing the PSMS-Self to explore actives of daily living with participants who have an age range comparable to the one in this study (e.g., ages 19 to 90 plus) does not exist to the researcher's knowledge. As a result, there is potential for there to be an age-based

bias in the PSMS-Self. It was used in this study, however, because research indicates that it is less biased than other assessments measuring activities of daily living, such as the Katz Index of Independence in Activities of Daily Living (LaPlane, 2010; Mlinac & Feng, 2016).

The PSMS-Self was adapted from the Langley-Porter Scale (Lowenthal, 1964), which also assesses the same six activities of daily living. Critics of the Langley-Porter Scale cite the inconsistency in the number of points per item scale and overly broadened categories create limitations on the assessment (Lawton & Brody, 1969; Lowenthal, 1964). Lawton and Brody (1969) addressed the limitations of the Langley-Porter Scale (Lowenthal, 1964) in their creation of the Physical Self-maintenance Scale, Instrumental Activities of Daily Living Scale and the Physical Self-maintenance Scale Self-Report. Participants (n=265) in the study conducted by Lawton & Brody (1969) consisted of individuals from diverse ethnic, racial, and socioeconomic populations. Lawton & Brody (1969) correlated scores obtained on the PSMS-Self with a physical classification six-point rating scale, a 10-item mental status questionnaire, and a behavior and adjustment rating scale that consisted of four, six-point scales. All produced significant correlations at the .01 level except for the behavioral and adjustment rating scale ($r(44) = 0.36$, $p < 0.01$). Additionally, another sample (n=180) completed the PSMS-Self, and their scores were correlated with the original study sample, which accounted for halo effect and demonstrated the measure's validity. Test-retest reliability was determined using a Guttman scale and produced a coefficient of 0.96 and the Pearson's r between the correlation of the two samples was 0.87, where participants in the study were age 60 year and older. Additionally, the PSMS-Self has been demonstrated a correlation coefficient range of 0.65 to 0.91 using Guttman model with the Katz Index of Independence in Activities of Daily Living, indicating convergent

validity (LaPlane, 2010; Mlinac & Feng, 2016). Finally, a population mean μ=4, where sd =1.8 is reported for this assessment (Hokoishi et al., 2001).

**PROMIS**

Three PROMIS measures, created by Cella and colleagues (2010), were used to assess social connectedness: (1) the PROMIS Ability to Participate in Social Activities adult short form, (2) the PROMIS Social Isolation adult short form, and (3) the PROMIS Companionship adult short form. The PROMIS Ability to Participate in Social Activities short form is an eight-item, self-report measure of respondents' engagement in leisure, familial, occupational, and peer-related activities. Items are scored on a five-point Likert-scale with a score of five equating to Never and a score of one equating to Always. Scores on this scale range from eight to 40, with higher scores indicating a lower level of participation in social roles and activities and lower scores indicating higher levels of participation in social roles and activities.

The PROMIS Social Isolation short form scale is an eight-item, self-report measure of respondents' self-perceptions of their isolation, detachment, and feelings of being excluded. The PROMIS Companionship short form is a six-item, self-report measure of respondents' ability to identify one or more individuals with whom they can engage in leisure or social activities. The PROMIS Social Isolation short form and PROMIS Companionship short form are scored on a five-point Likert-scale, with a score of one equating to Never and a score of five equating to Always. Scale scores range from eight to 40 and six to 30 on the PROMIS Social Isolation-Short form and the PROMIS Companionship-Short Form, respectively, with higher scores indicating higher levels of social isolation or social companionship and lower scores indicating lower levels of social isolation or social companionship.

Items for each PROMIS assessment were developed by a team of investigators that consisted of experts in the field of social health measurement and assessment (DeWalt et al., 2007). The investigators engaged in a six-phase qualitative item review to determine existing items, classify and select items, review and revise items, conduct a focus group regarding domain coverage, engage in interviews with team members regarding the items selected, and a final review of the measure (DeWalt et al., 2007). After the assessments were created, participants from both the general population (n=900) and participants identified as having a diagnosed disability (n=500) completed the assessments to determine the psychometric properties of the measures. Internal consistency was calculated using Cronbach's alpha as 0.93, 0.91 and 0.93 for the three assessments, respectively, indicating high degrees of internal reliability (O'Haire & Rodriquez, 2018). Construct validity was established by correlating items related to participation in discretional social activities and satisfaction with participation in social roles on the PROMIS short-form social scales with items on the FACIT-Functional Well-Being Scale and the SF-36 Role Physical, Role Emotional, and Social Functional Scales (Cella et al., 2010). Moderate to strong construct validity was demonstrated, with items related to participation in discretional social activities producing correlation coefficients of 0.75, 0.43, 0.51, and 0.52, respectively and items related to satisfaction with participation in social roles producing correlation coefficients of 0.74, 0.56, 0.57, and 0.57, respectively (Cella et al., 2011). Finally, according to the test manuals for all three PROMIS instruments, the population mean is reported as $\mu=50$, where sd=10 (PROMIS, 2022; PROMIS, 2021; PROMIS, 2018).

**Employment Information**

Employment data was collected in the demographic questionnaire. Questions regarding employment included current employment status and if employed, satisfaction with employment,

and length of time at place of employment. A five-point Likert-scale regarding employment satisfaction was also included with a rating of one indicating very satisfied and a rating of five indicating very dissatisfied. Descriptive statistics were used to provide information regarding the employment status of the study sample. A one sample t-test was utilized to analyze job satisfaction and length of time employed. The one sample t-test allowed for the comparison of job satisfaction and length of employment of the study sample to the general United States population. According to research, in 2021, 56.9 percent of individuals are satisfied with their employment in the United States and in 2020, the average length of employment in the United States is 4.1 years (Bureau of Labor Statistics, 2020; Levanon et al., 2021). The results of the one sample t-test provided information regarding employment satisfaction and length of employment variability for individuals with physical disabilities that own service dogs.

**16-item Flanagan Quality of Life Scale (QOLS)**

The 16-item Flanagan Quality of Life Scale, or QOLS, is the self-report measure that was used to assess participants' quality of life. The 16-item QOLS is a self-report evaluation of individuals' perceptions of their quality of life, related to 16 constructs. For example, health, relationships, social participation, learning, self-understanding, work, leisure, independence, amongst other constructs are assessed by the instrument. The16-item QOLS was adapted from the 15-item QOLS to include an independence domain, which is designed to assess the independence of individuals with chronic conditions (Flanagan, 1978; Flanagan, 1982).To adapt the instrument, a random sample of United States citizens (n = 3,000) were interviewed, and themes based on the interviews were used to create the five domains of the QOLS (i.e., material and physical well-being, relationships with others, social and community activities, personal development and recreation) (Flanagan, 1978). After creating the 16-item QOLS, Flanagan

(1978) conducted another study of content validity. In that study, the assessment was administered to participants (n = 3,000) ages 30, 50, and 70, with each age group consisting of 500 individuals who identified as male and 500 individuals who identified as female. Participants identified independence as an important aspect of quality of life and the 15-item QOLS was updated to the 16-item QOLS (Burckhardt et al., 1989).

The psychometric properties of the 16-item QOLS have been studied by Burckhardt and several colleagues (2003). Burckhardt and colleagues (2003) demonstrated that the 16-item QOLS is internally consistent ($\alpha = 0.82$ to 0.92) and Burckhardt and Anderson (2003) reported that the instrument has moderate to high test-retest reliability ($r = 0.78$ to 0.84). Convergent and discriminant construct validity were determined based on the high correlation of the QOLS to the Life Satisfaction Index-Z ($r = 0.67$ to 0.75) and low correlation to the Duke Physical Health Status Subscale and Arthritis Impact Measurement Scale ($r = 0.28$ to 0.44) (Burckhardt et al., 2003; Burckhardt, & Anderson, 2003). The population means for this assessment are $\mu=90$ for a healthy population, $\mu=83$ for individuals with rheumatoid arthritis and $\mu=61$ for individuals with posttraumatic stress disorder (Burckhardt & Anderson, 2003). For the purposes of the current study, a population mean of $\mu=83$ was used for data analysis, as rheumatoid arthritis can be classified as a physical disability, and this provides a more accurate population mean to compare the current study participants against.

The 16-item QOLS was originally intended to assess the quality of life of individuals with chronic disabilities. Recent uses of the measure, however, have included assessing the quality of life for individuals with disabilities that use service dogs (Flanagan, 1978; Hall et al., 2017; McIver et al., 2020). Hall and colleagues (2017) used the 16-item Flanagan QOLS to compare the quality of life scores for participants with physical disabilities (n=72) and hearing

impairments (n=111) who use service dogs to participants with physical disabilities (n=24) and hearing impairments (n=30) who were awaiting placement with a service dog. Results of the study indicated that participants with service dogs rated their overall quality of life higher than participants without service dogs (Hall et al., 2017). In fact, participants with service dogs reported significantly higher quality of life scores on 11 of the 16 items on this measure (Hall et al., 2017). The results of this study indicate the reliability and validity of the 16-item Flanagan QOLS when examining individuals with physical disabilities perceptions of their quality of life (Hall et al., 2017). Results indicate that owning a service dog positively impacts the quality of life of people with physical disabilities (Hall et al., 2017). Initial research regarding the impact of service dogs on quality of life has been positive, however, stronger empirical evidence is required to further validate the use of service dogs as an intervention for individuals with physical disabilities.

## Data Collection and Procedures

All data collection activities and recruitment for this study were approved by the Auburn University Institutional Review Board, or IRB. Data collection occurred between February 2021 and January 2022. Data was collected using an online survey hosted by Qualtrics, which employs security measures and encryption. A BOX file was used as a repository for housing the data and employs double encryption security. An initial email was sent to 113 service dog organizations found in Appendix A. This email provided a brief overview of the purpose of the study, eligibility criteria for study participants and subsequent actions should the organization agree to participate in the study, including completing the site authorization letter (see Appendix D) and agreeing to distribute the participant recruitment email and flyer to service dog owners. To receive and distribute the participant recruitment email and flyer, organizations were required by

the IRB to complete and return a site authorization letter to the researcher. The site authorization letter outlined the purpose of the study, the organization's role and expectations, and the researcher's role and expectations, as well as the confidential and voluntary nature of participation and data collection and data storage methods. To complete the site authorization letter, a service dog organization representative had to review the letter and if they agreed, was required to sign, put the organization's information into the letter (e.g., organization letter head) and send the completed letter back to the researcher via email. Upon receipt of the site authorization letter, the researcher provided organization representatives with the participant recruitment email and flyer, which contained information regarding participant eligibility, an overview of the study, the researcher's contact information, and a link to the Qualtrics survey, which allowed participants to self-select into the study and immediately be provided with the survey. This portion of the sampling process assisted in maintaining the anonymous nature of data collection by ensuring that the researcher did not obtain identifying information, such as names and contact information, that could be been obtained if the researcher sent the recruitment email and flyer directly to service dog recipients.

The first round of recruitment occurred on February 14, 2021, with the service dogs organizations identified in Appendix A being contacted via email. Following this first recruitment effort, eight organizations agreed to send the survey to their constituents and sent the researcher a completed IRB approved site authorization agreement letter. Nine organizations declined to send the survey to service dog recipients. Finally, two organizations indicated they would send the study to their service dog recipients, but never completed the site authorization agreement letter. The first round of sampling yielded six participant responses on the survey.

The second round of recruitment occurred on June 21, 2021. The researcher resent the recruitment letter via email to all organizations identified in Appendix A that did not respond during the first round of sampling, which resulted in three organizations agreeing to send the survey to their service dog recipients and providing the researcher with a completed site authorization agreement letter. During this second sampling round, six organizations declined to participate in the study. Four additional organizations indicated they would send the survey to constituents but failed to complete the site authorization letter. The second round of recruitment resulted in two additional response on the survey.

The third round of recruitment occurred on December 21, 2021. Again, the researcher resent the recruitment letter via email to all organizations identified in Appendix A that did not respond to the previous sampling attempts. This round of recruitment produced five additional organizations that agreed to send the survey to their service dog recipients and sent the researcher a completed site authorization letter. Two organizations declined to participate in the study and one organization agreed to send the survey to constituents but did not complete the site authorization letter.

Due to the low response rate from both service dog organizations and their constituents, the researcher decided to begin an alternative, approved recruitment method. During the first two weeks of January 2022, the researcher called 12 organizations from the list in Appendix A who had not replied to the previous contact attempts. To maintain demographic diversity amongst participants, thus increasing the generalizability of the results, the researcher chose at random three organizations from four different geographic regions across the United States (e.g., the South, Northeast, Midwest and West). Of the 12 organizations called, the researcher was able to speak with seven organizational representatives on the first call attempt and left a voice message

for the five organizations that did not answer. Two organization representatives called the researcher back, resulting in nine organization responses total, with only one organization declining to participate in the study. Eight organizations agreed to send the survey to their constituents and were sent a follow up email containing a brief summary of the study and the site authorization letter. Only six organizations, however, completed site authorization letters. Between the third round of electronic recruitment and the phone calls, the researcher obtained seven additional participant responses on the survey and achieved the sample size threshold of a pilot study.

Individuals who self-selected to participate in the study were first required to consent to participation before completing a demographic questionnaire, the Physical Self-maintenance Scale (Lawton & Brody, 1969), the PROMIS Ability to Participate in Social Activities adult short form (Cella et al., 2010), the PROMIS Social Isolation adult short form (Cella et al., 2010), the PROMIS Companionship adult short form (Cella et al., 2010), and finally, the 16-item Flanagan QOLS (Flanagan, 1982). For participants to be included in the study, they required internet access to complete the survey. It was estimated the survey would take a total of 20-30 minutes to complete all of the measures in the study. This estimation was obtained by adding together all of the estimated administration times provided by the assessment manuals for each instrument utilized in this study (e.g., PSM-Self, PROMIS Ability to Participate in Social Activities adult short form, PROMIS Social Isolation adult short form, PROMIS Companionship adult short form and Flanagan QOLS take five minutes to complete). The researcher also accounted for time it would take to complete the demographic questionnaire, resulting in 20-30 minutes estimated completion time for this survey. Masking did not occur in this study, since participants in both groups received all components of the survey.

## Quality of Measurements

Only the researcher analyzed the data. Therefore, interrater reliability was not a concern for this study, nor was training required for additional researchers. Prior to scoring the assessments, however, the researcher underwent training, using the assessment training manuals, to become more knowledgeable of the scoring procedures and interpretations of the results and limit threats to the reliability and validity of the present study.

Additionally, the researcher remained up to date on their Collaborative Institutional Training Initiative, or CITI, certifications. The online CITI program trains researchers on ethical considerations and best practices in protecting participant welfare, as well as special topics involved with utilizing human research participants (i.e., working with minors, cultural competence in research) (Braunschweiger & Kenneth, 2007; Hadden et al., 2018). By maintaining a CITI certification, the researcher remained abreast of research best practices related to conducting survey research.

## Data Diagnosis

Once the data collection process was completed, the researcher screened and cleaned the data to identify and exclude data sets that were incomplete, as well as ensure all participants had physical disabilities, according to the definition provided previously in this study. All 16 data sets were complete, and no data sets were excluded due to being incomplete. When screening the data based on disability, the researcher excluded one data set because the participant indicated their primary disability was one that was more appropriately classified as a neurological disorder. Similarly, this participant disclosed a secondary disability, which could also not be considered a physical disability per the definition utilized in this study. The screening and cleaning of the data resulted in 15 complete data sets being included for the purpose of data analysis in this study.

## Analytic Strategies

Data analysis was performed in three phases. First, descriptive statistics were analyzed for all categorical variables collected on the demographic questionnaire (e.g., age, gender, ethnicity, race, highest level of education, relationship status, employment status, and length of time employed). Descriptive statistics are used to summarize and describe evaluated characteristics of a data set (Acosta & Brooks, 2021; Rodriques et al., 2017; Vetter, 2017). Typically, measures of central tendency (e.g., mean, median, and mode) and measures of variability (e.g., standard deviation, variance, kurtosis, etc.) are utilized to provide descriptive statistics (Laccourreye et al., 2021; Rodriques et al., 2017; Vetter, 2017). Measures of central tendency place emphasis on the average of the data set and measures of variability assess the spread or dispersion of the data in the set (Rodriques et al., 2017; Vetter, 2017). While descriptive statistics do not provide inferences or predictions, they allow researchers to gain a holistic understanding of their sample and information gathered, as well as identify any potential limitations, such as biases (e.g., gender bias, age bias, etc.) that may exist and could potentially impact results (Laccourreye et al., 2021; Rodriques et al., 2017; Vetter, 2017).

In the second phase, seven one-tailed, one-sample t-tests were conducted to evaluate statistical differences amongst the sample data and the general population on outcome measures (i.e., activities of daily living, social connectedness, and quality of life), as well as for employment satisfaction and length of employment information collected in the demographic questionnaire. A one-sample t-test is a statistical analysis method for hypothesis testing that allows for inferences to be made between a population mean and a sample's mean for a given variable or observation (Kim, 2015; Rochon & Kieser, 2011). The one-sample t-test assumes that there is a normal distribution for the sample mean and that there are no significant outliers within

the data (Francis & Jakicic, 2021; Kim, 2015; Rochon & Kieser, 2011). In a one-sample t-test, the null hypothesis represents the absences of an effect for a given variable (Francis & Jakicic, 2021; Kim, 2015; Rochon & Kieser, 2011). One-sample t-tests are often used when the sample size for a study is small, however, this means that individual data has more influence on variance, or the measure of dispersion (Kim & Park, 2019).

One-sample t-tests can either be one-tailed or two-tailed. A one-tailed test is used to determine the relationship between variables in one direction, either greater or less than the critical value (Braver, 2007; Ruxton & Neuhauser, 2010). On the other hand, a two-tailed test is non-directional, meaning the test indicates the probability of a relationship between variables in either direction (Banerjee et al., 2009; Ruxton & Neuhauser, 2010). In a two-tailed test, the null hypothesis is rejected if the t value falls in either of the tails, or outside of a critical range on the normal distribution (Braver, 2007; Ruxton & Neuhauser, 2010). The two-tailed test is typically utilized when comparing two groups since the test examines both the positive and negative tails of the normal distribution (Braver, 2007; Banerjee et al., 2009).

The key advantage of using a one-tailed test is that it has more power than a two-tailed test, allowing for more significant results if a difference between the groups being examined exists in the assumed direction (Braver, 2007; Banerjee et al., 2009). Additionally, a one-tailed test requires fewer participants to reach significance of results (Banaerjee et al., 2009). This is because, in a two-tailed test, the significance level is split between both tails, whereas in a one-tailed test, all of the significance level is placed in one direction (Banaerjee et al., 2009). The key disadvantage of a one-tailed test is that there is no statistical power present to determine if there is an effect in the opposite direction not examined (Braver, 2007; Ruxton & Neuhauser, 2010).

For the purposes of statistical analysis for the present study, a one-tailed, one-sample t-test was utilized given the small sample size. Additionally, because the hypotheses for the study examine significance in one direction for all four constructs, one-tailed tests were most appropriate for the study. As well, the one-sample t-test allowed for inferences to be made between the population mean on each instrument used to examine the four constructs of the study and the sample mean.

In the third phase of data analysis, seven correlation analyses were conducted to evaluate the statistical relationship between the amount of time that participants owned their service dogs and each outcome measure. A correlation analysis is utilized to measure the extent of a relationship between two continuous variables by assisting researchers in predicting if there is a relationship between the two variables assessed (Asamoah, 2014; Janse et al., 2021; Schober et al., 2018). It does not, however, indicate causation between the two variables due to the existence of confounding variables, or other factors that influence the relationship between two variables (Asamoah, 2014; Janse et al., 2021; Schober et al., 2018). Therefore, correlation analyses do not indicate if once variable causes a change in the other variable, rather it examines the extent of the relationship between two variables (Asamoah, 2014; Janse et al., 2021; Schober et al., 2018).

Results of a correlation analysis can produce either a positive correlation, a negative correlation or no correlation (Asamoah, 2014; Janse et al., 2021; Schober et al., 2018). A positive correlation indicates that when one variable increases, so does the other variable (Janse et al., 2021). On the other hand, a negative correlation indicates that when one variable increases, the other variable will decrease (Janse et al., 2021). Finally, a result of no correlation indicates that there is no relationship between the two variables (Janse et al., 2021). A correlation analysis produces a correlation coefficient, or Pearson's r, which can range from -1 to 1 (Asamoah, 2014;

Janse et al., 2021; Schober et al., 2018). A Pearson's r of -1 indicates a perfect negative correlation, while a Pearson's r of 1 indicates a perfect positive correlation (Asamoah, 2014; Janse et al., 2021; Schober et al., 2018). A correlation coefficient of 0 indicates no correlation (Asamoah, 2014; Janse et al., 2021; Schober et al., 2018).

When interpreting the correlation coefficient, it is important to consider the context and purpose of the variables being examined (Janse et al., 2021; Schober et al., 2018). While there are no set cut off points to interpreting the extent of the relationship between two variables, general guidelines for interpreting correlation size are as follows (Schober et al., 2018). A correlation coefficient between 0 and .10 (0 to -.10) indicates a negligible correlation, a coefficient between .10 and .39 (-.10 to -.39) indicates a weak correlation, a coefficient between .40 and .69 (-.40 to -.69) indicates a moderate correlation, a coefficient between .70 and .89 (-.70 to -.89) indicates a strong correlation and a coefficient between .90 and 1 (-.90 to -1) indicates a very strong correlation (Schober et al., 2018). To assist in interpreting correlation coefficients, variance, or coefficient of determination, is often used (Janse et al., 2021; Schober et al., 2018). Variance is used to estimate the strength of the relationship between two variables or the degree to which one variable can be explained by the other variable (Janse et al., 2021; Schober et al., 2018).

One key disadvantage of correlation analyses is the fact that the correlation only examines two variables and does not account for confounding variables which can impact the relationship between the two variables being explored (Janse et al., 2021; Schober et al., 2018). Additionally, outliers in the data can affect the correlation coefficient and can negatively impact the interpretation of results (Janse et al., 2021; Schober et al., 2018). Finally, a key disadvantage

is that a correlation does not indicate a cause-and-effect relationship between the two variables, rather that there is a relationship between the variables (Janse et al., 2021; Schober et al., 2018).

For the purpose of the present study, correlation analyses allowed the researcher to explore the relationship between the four study constructs and the length of time that participants had owned service dogs. By running the correlation analyses, the researcher examined the relationship between the four study constructs and participant's length of service dog ownership. The statistical results of the one-tailed, one-sample t-tests and the correlation analyses are discussed in Chapter III of the study.

**Limitations of Study Design**

Self-report survey research posed a potential threat to the internal validity of a study, since a nonprobability sampling method was used and the independent variable was not manipulated (Lundqvist et al., 2019; Titus, 2007). Self-selection bias may have occurred since participants had the autonomy to engage in the study, which created a nonprobability sample (Lundqvist et al., 2019; Titus, 2007). To control for the lack of random sampling in this study, a sample size large enough to produce at least a small effect size and produce statistical power was used. Finally, because the survey relies on the self-report of participants, social desirability bias threatened the internal validity of the study. To account for social desirability bias, participants were reminded that responses are anonymous and kept confidential.

## Summary

To date, only a handful of empirical studies regarding the impacts of service dogs for individuals with physical disabilities exist and are often focuses on a subset of the physical disability populations. A majority of the existing literature has limitations of small sample sizes and lack of diversity in participant demographics. The aim of the current study was to explore

the impacts service dogs have the activities of daily living, social connection, employment, and quality of life for individuals with physical disabilities. Chapter II presents the cross-sectional survey research design for quantitative descriptive research methodology and theoretical framework that was used for the examining the impact of service dogs on activities of daily living, social connectedness, employment, and quality of life for individuals with physical disabilities.

Chapter II specifically describes the methods for the study, which includes descriptive information and inclusion criteria for participants, measures, procedures, data analyses, and anticipated limitations. Participants for this study were recruited from organizations that train and place service dogs with individuals with physical disabilities and were at least 19 years old, able to speak English, had computer and internet access, were diagnosed with a physical disability and either had a service dog, or were on a waiting list to receive a service dog. The electronic survey that was used to collect data contained a demographic questionnaire, which collected data regarding participants' age, sex, ethnicity, race, highest level of education, relationship status, disability status, employment status and if employed, satisfaction with employment and length of time at place of employment. Additionally, for participants on a waiting list to receive a service dog, participants were asked the amount of time they had been on a waiting list to receive their dog. Participants were also be asked if they currently or had previously owned a service dog, and if so, how many service dogs they had owned. In addition to the demographic questionnaire, participants were asked to complete a measure of independence in completing activities of daily living, the PSMS-Self, measures of social connectedness, the PROMIS Ability to Participate in Social Activities adult short form, the PROMIS Social

Isolation adult short form, the PROMIS Companionship adult short form, and a measure of quality of life, the 16-item Flanagan QOLS.

Upon receiving approval from the Auburn University Institutional Review Board, data was collected using an online survey hosted by Qualtrics, which provided a secure site to host the data collected, following a recruitment email and flyer being sent to the 113 predetermined organizations that train and place service dogs with individuals with physical disabilities. Due to the low response rate, four rounds of recruitment occurred, with three rounds of recruitment emails sent to service dog organizations and one round of the researcher calling randomly selected organizations. Recruitment efforts resulted in a total of 24 organizations agreeing to distribute the study to constituents.

Upon receiving a completed site authorization letter, a participant recruitment flyer and email were sent to organizations to disseminate to their constituents which provided them with access to the electronic survey. Participants who consented to participate in the study then completed the online survey consisting of the demographic questionnaire, the PSMS-Self, the PROMIS Ability to Participate in Social Activities adult short form, the PROMIS Social Isolation adult short form, the PROMIS Companionship adult short form, and the 16-item Flanagan QOLS. Participants completed all aspects of the electronic survey. A total of 16 responses were received, and ultimately, 15 complete data sets were included for the purpose of data analysis in this study.

To analyze data collected on the electronic survey, one-tailed, one-sample t-tests were conducted to explore the differences in outcome measures (i.e., activities of daily living, social connectedness, employment, and quality of life) between population means and the sample means for each variable. Additionally, descriptive statics for categorical variables (e.g., age, sex,

ethnicity, race, highest level of education, relationship status, employment status, and length of time employed) collected on the demographic questionnaire provided a holistic view of the study sample. Finally, correlational analyses were used to examine the relationship between the length of service dog ownership on the four study constructs. These analytic strategies assisted in examining each of the studies hypothesis and answering the overarching research questions that drive the present study of exploring the impact of owning service dogs on individuals with physical disabilities independence in completing activities of daily living, social connectedness, employment, and overall quality of life. Chapter III presents the results from the data analyses conducted.

Limitations of the design of the study included the potential for self-selection bias, which threatened the internal validity of the study. Additionally, the lack of a randomized sampling methods limited the generalizability of findings and threatened the external validity of the study. Finally, because the survey relied on the self-report of participants, social desirability bias threatened the internal validity of the study.

## Chapter III. Results

The results and findings of the statistical analysis of data for the present study are presented in this chapter. The goal of the current study was to examine the impact service dogs have on individuals with diverse physical disabilities regarding their activities of daily living, social connection, employment and quality of life. Four research questions examining each of the constructs of the study guided this quantitative study. A cross-sectional survey research design was utilized, and data was collected through an online survey hosted by Qualtrics. Organizations that train and place service dogs with individuals with disabilities were contacted and upon agreeing to disseminate the electronic survey to constituents by completing and signing a site authorization letter (see Appendix D), the organizations were provided a recruitment email and flyer to distribute the survey to their service dog recipients. A total of 24 service dog organizations completed the site authorization letter and agreed to send the flyer and recruitment email to their service dog recipients. The flyer included study inclusion criteria, information, and a link to the survey.

Upon self-selection to complete the survey, participants were directed to the informed consent letter and were required to provide consent before they could engage in the survey (see Appendix B). Once consent was provided, participants were provided with and completed a demographic questionnaire, which contained question regarding their employment, as well as the PSMS-Self, the PROMIS Ability to Participate in Social Activities adult short form, the PROMIS Social Isolation adult short form, the PROMIS Companionship adult short form, and the 16-item Flanagan QOLS. The overall time commitment for completion of the survey was estimated to be between 20 and 30 minutes. A total of 16 individuals consented to participate and completed the study survey. This study was based on data for 15 of these individuals. At the

conclusion of the survey, participants were provided with a link to participate in an incentive raffle drawing, where participants had a chance of entering a randomized drawing to receive one of five 50-dollar electronic Amazon gift cards.

To analyze data obtained through the electronic survey, descriptive statistics, seven one-tailed, one-sample t-tests and seven correlational analyses were utilized. The descriptive statistics presented provide readers with a holistic understanding of participant characteristics. The one-tailed, one-sample t-tests allowed the researcher to examine differences in service dog owners' independence in completing actives of daily life, employment, social connectedness, and quality of life when compared to population means. For all t-test conducted in the present study, a significance level of $\alpha$=.05 was utilized. Finally, the correlation analyses allowed the researcher to examine the relationship between length of service dog ownership and the four study constructs. The results of the statistical analyses are presented below.

## Demographics

A total of 16 individuals consented to participate in the survey. As discussed previously, one data set was excluded due to the participant reporting having primary and secondary disabilities that do not meet the inclusion criteria, per the definition of physical disability utilized for the purposes of the current study. The exclusion of this data set resulted in a total of 15 participant responses being used for data analysis. Table 1 presents the overall demographic characteristics of participants.

Table 1. Demographics

| Demographic | N | % |
|---|---|---|
| **Age** | | |
| 19-29 | 3 | 20 |
| 30-39 | 3 | 20 |
| 40-49 | 1 | 6.7 |
| 50-59 | 3 | 20 |

| | | |
|---|---|---|
| 60-69 | 4 | 26.7 |
| 70-79 | 0 | 0 |
| 80-89 | 1 | 6.7 |
| 90 plus | 0 | 0 |
| **Gender** | | |
| Male | 2 | 13.3 |
| Female | 13 | 86.7 |
| Transgender | 0 | 0 |
| Other | 0 | 0 |
| **Race/Ethnicity** | | |
| African American/Black | 1 | 6.7 |
| Caucasian/White | 14 | 93.3 |
| Latino/Hispanic | 0 | 0 |
| Asian | 0 | 0 |
| Pacific Islander | 0 | 0 |
| Native American | 0 | 0 |
| Biracial | 0 | 0 |
| Multiracial/Multi-ethnic | 0 | 0 |
| Other | 0 | 0 |
| **Highest level of education completed** | | |
| No schooling completed | 0 | 0 |
| Grade 1 through 11 | 0 | 0 |
| Grade 12 – No diploma | 0 | 0 |
| High school diploma | 3 | 20 |
| GED or alternative credential | 0 | 0 |
| Some college – No degree | 1 | 6.7 |
| Associate's degree | 1 | 6.7 |
| Bachelor's degree | 5 | 33.3 |
| Master's degree | 2 | 13.3 |
| Professional degree beyond Bachelor's degree | 2 | 13.3 |
| Doctorate degree | 1 | 6.7 |
| **Marital status** | | |
| Single, never married | 7 | 46.7 |
| Married | 7 | 46.7 |
| Widowed | 1 | 6.7 |
| Divorced | 0 | 0 |
| Separated | 0 | 0 |
| **Region of U.S. residency** | | |
| Northeast | 1 | 6.7 |
| Midwest | 10 | 66.7 |
| South | 0 | 0 |
| West | 4 | 26.7 |
| **Primary disability** | | |
| Arthritis | 0 | 0 |
| Brain Injury | 0 | 0 |
| Cerebral palsy | 0 | 0 |

| | | |
|---|---|---|
| Dwarfism | 0 | 0 |
| Epilepsy | 1 | 6.7 |
| Hearing impairment | 0 | 0 |
| Multiple sclerosis | 0 | 0 |
| Muscular dystrophy | 0 | 0 |
| Spina bifida | 0 | 0 |
| Spinal cord injury | 2 | 13.3 |
| Visual impairment | 0 | 0 |
| Other | 12 | 80 |
| **Employment status** | | |
| Employed part-time | 1 | 6.7 |
| Employed full-time | 2 | 13.3 |
| Self-employed | 2 | 13.3 |
| Student | 2 | 13.3 |
| Military | 0 | 0 |
| Retired | 4 | 26.7 |
| Unemployed | 0 | 0 |
| Unable to work | 4 | 26.7 |
| Furloughed/laid-ff due to COVID-19 | 0 | 0 |
| **Length of Employment** | | |
| Less than 6 months | 0 | 0 |
| 6 months to a year | 0 | 0 |
| 1-2 years | 0 | 0 |
| 2-3 years | 0 | 0 |
| 3-4 years | 0 | 0 |
| 4-5 years | 4 | 26.7 |
| 5-6 years | 0 | 0 |
| 6-7 years | 0 | 0 |
| 7-8 years | 0 | 0 |
| 8-9 years | 0 | 0 |
| 10 or more years | 1 | 6.7 |
| No response | 10 | 66.7 |
| **Employment Satisfaction** | | |
| Very Dissatisfied | 0 | 0 |
| Dissatisfied | 0 | 0 |
| Neutral | 2 | 13.3 |
| Satisfied | 1 | 6.7 |
| Very Satisfied | 2 | 13.3 |
| No response | 10 | 66.7 |
| **Currently own a service dog** | | |
| Yes | 15 | 100 |
| No | 0 | 0 |
| **Length of time service dog owned** | | |
| Less than 6 months | 1 | 6.7 |
| 6 months to a year | 4 | 26.7 |
| 1-2 years | 2 | 13.3 |

| | | |
|---|---|---|
| 2-3 years | 2 | 13.3 |
| 3-4 years | 0 | 0 |
| 4-5 years | 0 | 0 |
| 5-6 years | 2 | 13.3 |
| 6-7 years | 1 | 6.7 |
| 7 or more years | 3 | 20 |
| **Previous service dog ownership** | | |
| Yes | 5 | 33.3 |
| No | 11 | 73.3 |
| **On a waitlist to receive a service dog** | | |
| Yes | 0 | 0 |
| No | 15 | 100 |
| **Length of time on waiting list** | | |
| Not applicable | 12 | 92.3 |
| Less than a month | 0 | 0 |
| 1-3 months | 0 | 0 |
| 3-6 months | 0 | 0 |
| 6-12 months | 0 | 0 |
| 1-2 years | 1 | 6.7 |
| 2-3 years | 0 | 0 |
| 3 or more years | 0 | 0 |

When examining the age of participants, ages ranged from 19-29 to 80-89 years old. Three individuals (20%) reporting being between the ages of 19 and 29, three (20%) reported being between the ages of 30 and 39, one participant (6.7%) reported being between the ages of 40 and 49, three (20%) reported being between the ages of 50 and 59, four (26.7%) reported being between the ages of 60 and 69, and one individual reported being between the ages of 80 and 89 (6.7%). There were no participants between the ages of 70 and 79 or over the age of 90. In terms of gender identification, 13 participants (96.7%) identified as female and only two individuals (13.3%) identified as male. No participants reported identifying as transgender or other. As for race/ethnicity, 14 participants (93.3%) identified as Caucasian/White and one participant (6.7%) identified as African American/Black. No other races/ethnicities were represented in the study.

In terms of the participants' highest level of education completed, three individuals (20%) reported obtaining a high school diploma, one (6.7%) reported attending some college but not earning a degree, one participant (6.7%) reported earning an associate's degree, five (33.3%) reported obtaining a bachelor's degree, two individuals (13.3.%) reported earning a master's degree, two (13.3%) reporting obtaining a professional degree beyond their bachelor's degree, and one participant (6.7%) reported earning a doctorate. As for the marital status of participants, seven participants (46.7%) reported being single and never married, seven participants (46.7%) reported being currently married, and one individual (6.7%) reported being widowed. None of the participants reported being divorced or separated at the time of the study. Geographically, one participant (6.7%) reported living in the Northeast, 10 individuals (66.7%) lived in the Midwest, and four participants (26.7%) lived in the West. There were no study participants who reported living in the South at the time of the study.

When examining the primary disability reported by participants, one individual (6.7%) reported having epilepsy, two (13.3%) reported having a spinal cord injury, and the remaining 12 participants (80%) reported having a primary disability that was not listed. For participants who reported have a primary disability that was not listed, participants were provided a section to write in their primary disability. Other disabilities identified included Tourette syndrome, spastic paraparesis, Ehlers-Danlos syndrome, ataxia, cancer, diabetes, schwannomatosis or spinal cord tumors, post-polio, Charcot Marie Tooth, and two participants (13.3%) reported having Myasthenia Gravis. Participants were also asked if they had a secondary disability. Nine participants (60%) reported having at least one secondary disability. Specifically, one participant reported having attention deficit/hyperactivity disorder, depression, anxiety, and spasticity. Another participant reported their secondary disabilities included diabetes and chronic pain due

to falls related to their primary disability. One participant reported being deaf and also having chronic migraines, while another participant reported migraines and posttraumatic stress disorder. Severe allergies and posttraumatic stress disorder were reported by another individual. Finally, one participant reported spastic paraparesis, one reported having a traumatic brain injury, and one individual reported having a prosthetic leg.

All participants (n=15, 100%) in the study owned a service dog. As for length of time participants have owned their service dogs, ownership ranged from six months to over seven years. One individual (6.7%) owned their dog for less than six months, four participants (26.7%) owned their dogs for six months to a year, two (13.3%) owned their dogs for one to two years, two participants (13.3%) owned their dogs for two to three years, two individuals (13.3%) owned their dogs for five to six years, one (6.7%) owned their dog for six to seven years, and three participants (20%) owned their dogs for over seven years. Additionally, five participants (33.3%) previously owned another service dog, while 11 participants (73.3%) have never owned a service dog prior to receiving their current dog. Participants confirmed they currently owned a service dog when asked if they were currently on a waiting list to receive a service dog, as no participants indicated they were currently on a waiting list. When asked about current length of time on a waiting list to receive a service dog, however, 12 participants (92.3%) indicated the question was not applicable as they were not on a waiting list, one individual (6.7%) reported being on a waiting list for one to two years and two participants did not respond to the question.

**Research Question 1: How does people with physical disabilities who own service dogs compare with the general public regarding their independence in completing activities of daily living?**

To examine independence in completing activities of daily living for individuals with physical disabilities who use service dogs, participants were asked to complete the Physical Self-maintenance Scale Self-Report, or PSMS-Self, scale as part of the electronic survey utilized in the present study. Upon completing the demographic questionnaire on the electronic survey, participants were presented with the PSMS-Self. Each item on the PSMS-Self asks respondents to rate their independence levels on statements regarding activities of daily living. Item responses consisted of three response ranges from total independence to complete dependence (i.e., with no help, with some help, with total help). To score the PSMS-Self, scores from each item were totaled to provide a level of independence in completing six activities of daily living. Activities of daily living assessed included eating, dressing, caring for oneself, ambulating around the home environment, transferring in and out of bed, and bathing. When scoring the assessment, responses indicating total independence receive scores of one. Responses marked as some independence or total dependence receive scores of zero. Scores on this instrument, therefore, can range from six, indicating total independence, to zero, indicating total dependence and represent the individual's independence level in terms of completion of activities of daily living.

Participant scores on the PSMS-Self ranged from two to six, with an average score of 4.8 (M=4.8, sd=1.373). All response on each item indicated total independence or some dependence and there were no responses on this scale that indicated total dependence across any of the items. Table 2 provides each question on the PSMS-Self, along with a visual representation of participant responses on each item. All participants (n=15, 100%) indicated they could eat and

care for their own appearance without any assistance. Eleven participants (73.3%) reported they could bathe and dress and undress themselves completely interpedently, whereas four participants (26.7%) indicated they required some assistance for both activities. Seven participants (46.7%) indicated they required some help getting around their houses or apartments and eight participants (53.3%) indicated they could ambulate around their living spaces with no assistance. Finally, 12 participants (80%) reported they could get in and out of bed without any help and three participants (20%) indicated they required some assistance to get in and out of bed.

Table 2. PSMS-Self Results

| Item | Without Any Help | | With Some Help | | Someone Else does Activity for You | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| Do you eat? | 15 | 100 | 0 | 0 | 0 | 0 |
| Do you dress and undress yourself? | 11 | 73.3 | 4 | 26.7 | 0 | 0 |
| Do you take care of your own appearance? | 15 | 100 | 0 | 0 | 0 | 0 |
| Do you get around your house/apartment/room? | 8 | 53.3 | 7 | 46.7 | 0 | 0 |
| Do you get in and out of bed? | 12 | 80 | 3 | 20 | 0 | 0 |
| Do you bathe? | 11 | 73.3 | 4 | 26.7 | 0 | 0 |

A one-tailed, one-sample t-test was conducted to evaluate if individuals with physical disabilities who owned service dogs were more independent in completing activities of daily living when compared with the population mean for the PSMS-Self. For the purpose of this study, the population mean was reported as four, as indicated by Hokoishi and colleagues (2001). There was a significant difference in the independence levels in completing activities of daily living for individuals with physical disabilities who own service dogs (M=4.8, sd=1.373) when

compared with the population mean for the instrument (M=4) conditions; t(15)=2.256, p=.02. The 95 percent confidence interval for the mean difference between the two means was 4.04 and 5.56. Results indicate that there was a significant difference between the levels of independence in completing activities of daily living for participants with physical disabilities who own service dogs when compared with the population mean for the instrument. Based on the results, the null hypothesis for research question one was rejected and the alternative hypothesis was accepted.

**Research Question 2: Does more time owning a service dog increase people with physical disabilities independence in completing actives of daily living?**

To examine research question two, a correlational analysis was conducted. This correlational analysis explored the relationship between the time participants owned their service dogs and their independence in completing activities of daily living, as measured by the Physical Self-maintenance Scale Self-report. There was a positive correlation between participants' independence in completing activities of daily living and their length of service dog ownership, with r(13)=.26, p=.349. The coefficient of determination was $R^2$=.068. Results of this analysis indicate that there was a weak, positive correlation between participants' independence in completing activities of daily living and their length of service dog ownership. Based on the results, there was not a significant relationship between length of service dog ownership and independence in completing activities of daily living and the null hypothesis for research question two was accepted.

**Research Question 3: How does people with physical disabilities who own service dogs compare with the general public regarding their social connectedness?**

To examine social connectedness, three Patient-reported Outcomes Measurement Information System, or PROMIS, assessments were utilized; the PROMIS Ability to Participate

in Social Activities adult short form, the PROMIS Social Isolation adult short form, and the PROMIS Companionship adult short form. All three PROMIS instruments utilize a five-point Likert-scale response scale, ranging from Never to Always. In terms of scoring, each item on all three PROMIS assessments receives a score ranging from one to five. On the PROMIS Social Isolation short form and PROMIS Companionship short form, items rated as Never on the Likert-scale receive a score of one and items rated as Always receive a score of five, whereas on the PROMIS Ability to Participate in Social Activities short form, items rated as Never receive a score of five and items rated as Always receive a score of one. For all three PROMIS assessment, item responses are scored and scores for each item are added together to provide a raw score. Raw scores were converted to standard scores using the test manual. Raw scores for the PROMIS Ability to Participate in Social Activities short form and the PROMIS Social Isolation short form range from eight to 40 and standard scores on these two assessments range from 25.9 to 65.4 and 33.9 to 76.9, respectively. For the PROMIS Companionship short form, raw scores range from six to 30 and scaled scores range from 24.2 to 64.2.

**PROMIS Ability to Participate in Social Activities Short Form**

Two participants (13.3%) reported Never, seven individuals (46.7%) indicated Sometimes, and six participants (40%) responded Usually, in terms of the difficulty they experience when completing regular activities of leisure with others, as well as their difficulty completing all of the desired family activities. When responding to the question regarding difficulty of completing regular work both in a work setting and at home, one person (6.7%) responded Never having difficulty, five participants (33.3%) responded Rarely having difficulty, three individuals (20%) responded Sometimes having difficulty, five participants (33.3%) responded Usually having difficulty, and one person (6.7%) responded Always having difficulty

completing work. In regard to having trouble completing desired activities with friends, one participant (6.7%) responded Never, four individuals (26.7%) responded Sometimes, eight (53.3%) responded Usually, and two participants (13.3%) responded they Always have trouble completing all of the desired activities with friends.

In terms of having to limit activities done with others for fun, one person (6.7%) responded Never, four participants (26.7%) responded Sometimes, six individuals (40%) responded Usually, and four participants (26.7%) responded Always had to limit their activities. One participant (6.7%) responded Never, one person (6.7%) responded Rarely, five individuals (33.3%) responded Sometimes, six people (40%) responded Usually, and two participants (13.3%) responded they Always had to limit their typical activities with friends. In terms of family activities, one person (6.7%) responded Never, three participants (20%) responded Rarely, four (26.7%) responded Sometimes, six individuals (40%) responded Usually, and one person (6.7%) responded that they Always had to limit their activity. One person (6.7%) responded Never, three participants (20%) responded Rarely, five individuals (33.3%) responded Sometimes, five (33.3%) responded Usually, and one person (6.7%) responded they Always had difficulty completing work that was most important to the participant, both in the workplace and at home. Table 3 provides each question on the PROMIS Ability to Participate in Social Activities short form, along with a visual representation of participant responses on each item.

Table 3. Ability to Participate in Social Activities Results

| Item | Never | | Rarely | | Sometimes | | Usually | | Always | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % | N | % |
| I have trouble doing all of my regular leisure activities with others. | 2 | 13.3 | 0 | 0 | 7 | 46.7 | 6 | 40 | 0 | 0 |
| I have trouble doing all of the family activities I want to do. | 2 | 13.3 | 0 | 0 | 7 | 46.7 | 6 | 40 | 0 | 0 |
| I have trouble doing all of my usual work (include work at home). | 1 | 6.7 | 5 | 33.3 | 3 | 20 | 3 | 20 | 1 | 6.7 |
| I have trouble doing all of the activities with friends that I want to do. | 1 | 6.7 | 0 | 0 | 4 | 26.7 | 8 | 53.3 | 2 | 13.3 |
| I have to limit the things I do for fun with others. | 1 | 6.7 | 0 | 0 | 4 | 26.7 | 6 | 40 | 4 | 26.7 |
| I have to limit my regular activities with friends | 1 | 6.7 | 1 | 6.7 | 5 | 33.3 | 6 | 40 | 2 | 13.3 |
| I have to limit my regular family activities. | 1 | 6.7 | 3 | 20 | 4 | 26.7 | 6 | 40 | 1 | 6.7 |
| I have trouble doing all of the work that is really important to me (include work at home). | 1 | 6.7 | 3 | 20 | 5 | 33.3 | 5 | 33.3 | 1 | 6.7 |

A one-tailed, one-sample t-test was conducted to evaluate if ability to participate in social activities was greater for individuals with physical disabilities who owned service dogs when compared with the population mean for the PROMIS Ability to Participate in Social Activities. For the purpose of this study, the population mean utilized was M=50, as reported in the instrument test manual (PROMIS, 2018). There was a significant difference in the participants' ability to participate in social activities (M=42.213, sd=7.556) when compared with population mean for the instrument (M=50, SD=10) conditions; t(15)=-3.991, p=.001. The 95 percent confidence interval for the mean difference between the two mean was 38.028 and 46.398. Results indicate that there was a significant difference between the ability to participate in social activities for participants with physical disabilities who own service dogs when compared with the population mean for the instrument. This finding, however, indicates that participants had

less opportunity to participate in social activities than the general population on which the instrument was normed.

**PROMIS Social Isolation Short Form**

Examining responses on the PROMIS Social Isolation short form, when responding to the item regarding whether they feel left out, one person (6.7%) responded Never, 10 participants (66.7%) responded Sometimes, and four individuals (26.7%) responded they Usually. With regard to whether they feel known by other people, four participants (26.7%) responded Never, four individuals (26.7%) responded Rarely, four people (26.7%) responded Sometimes, one person (6.7%) responded Usually, and two participants (13.3%) responded Always. In terms of feeling isolated from others, two participants (13.3%) responded Never, one person (6.7%) responded Rarely, eight individuals (53.3%) responded Sometimes, two participants (13.3%) responded Usually, and two individuals (13.3%) responded Always. In terms of feeling that people are around but not with them, two individuals (13.3%) responded Never, three participants (20%) responded Rarely, seven participants (46.7%) responded Sometimes, one person (6.7%) responded Usually, and two participants (13.3%) responded Always.

When asked whether they felt isolated, even when not alone, two participants (13.3%) responded Never, five individuals (33.3%) responded Rarely, six participants (40%) responded Sometimes, and two participants (13.3%) responded Always. In terms of people avoiding talking to them, three participants (20%) responded Never, six individuals (40%) responded Rarely, five participants (33.3%) responded Sometimes, and one person (6.7%) responded Always . With regard to the question of feeling detached from others, two participants (13.3%) responded Never, two participants (13.3%) responded Rarely, seven participants (46.7%) responded Sometimes, two participants (13.3%) responded Usually, and two individuals (13.3%) indicated

Always. Finally, two participants (13.3%) responded Never, seven participants (46.7%) responded Rarely, three participants (20%) responded Sometimes, and three participants (20%) responded they Usually felt like a stranger to those around them. Table 4 provides each question on the PROMIS Social Isolation short form, along with a visual representation of participant responses on each item.

Table 4. Social Isolation Results

| Item | Never | | Rarely | | Sometimes | | Usually | | Always | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % | N | % |
| I feel left out. | 1 | 6.7 | 0 | 0 | 10 | 66.7 | 4 | 26.7 | 0 | 0 |
| I feel that people barely know me. | 4 | 26.7 | 4 | 26.7 | 4 | 26.7 | 1 | 6.7 | 2 | 13.3 |
| I feel isolated from others. | 2 | 13.3 | 1 | 6.7 | 8 | 53.3 | 2 | 13.3 | 2 | 13.3 |
| I feel that people are around me but not with me. | 2 | 13.3 | 3 | 20 | 7 | 46.7 | 1 | 6.7 | 2 | 13.3 |
| I feel isolated even when I am not alone. | 2 | 13.3 | 5 | 33.3 | 6 | 40 | 0 | 0 | 2 | 13.1 |
| I feel that people avoid talking to me. | 3 | 20 | 6 | 40 | 5 | 33.3 | 0 | 0 | 1 | 6.7 |
| I feel detached from other people. | 2 | 13.3 | 2 | 13.3 | 7 | 46.7 | 2 | 13.3 | 2 | 13.3 |
| I feel like a stranger to those around me. | 2 | 13.3 | 7 | 46.7 | 3 | 20 | 3 | 20 | 0 | 0 |

A one-tailed, one-sample t-test was conducted to evaluate if social isolation was greater for the general public when compared to individuals with physical disabilities who owned service dogs. For the purpose of this study, the population mean utilized was M=50, as reported in the instrument test manual (PROMIS, 2021). There was a significant difference in the participants' social isolation (M=54.667, sd=8.995) when compared with population mean for the instrument (M=50, SD=10) conditions; t(15)=-2.009, p=.032. The 95 percent confidence interval for the mean difference between the two mean was 49.686 and 59.648. Results indicate

that there was a significant difference between the social isolation for participants with physical disabilities who own service dogs when compared with the population mean for the instrument.

**PROMIS Companionship Short Form**

Examining if participants feel they have someone to have fun with, three participants (20%) reported Rarely, five individuals (33.3%) responded Sometimes, four participants (26.7%) responded Usually, and three participants (20%) reported Always. One participant (6.7%) responded Never, four individuals (26.7%) responded Rarely, two people (13.3%) responded Sometimes, five participants (33.3%) responded Usually, and three participants (20%) responded they Always felt they had someone to relax with. As for having someone to do enjoyable activities with, two participants (13.3%) responded Rarely, five individuals (33.3%) responded Sometimes, four participants (26.7%) responded Usually, and four participants (26.7%) reported Always. When asked whether they could find companionship when desired, one person (6.7%) responded Never, four individuals (26.7%) responded Rarely, four participants (26.7%) responded Sometimes, three participants (20%) responded Usually, and three individuals (20%) responded Always. With regard to having someone to keep them company, one person (6.7%) responded Never, two participants (13.3%) responded Rarely, five individuals (33.3%) responded Sometimes, two participants (13.3%) responded Usually, and five participants (33.3%) responded Always. Finally, two participants (13.3%) responded Rarely, six individuals (40%) responded Sometimes, four participants (26.7%) responded Usually, and three individuals (20%) responded they Always felt they have someone to go with them to events. Table 5 provides each question on the PROMIS Companionship short form, along with a visual representation of participant responses on each item.

Table 5. Companionship Results

| Item | Never | | Rarely | | Sometimes | | Usually | | Always | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % | N | % |
| Do you have someone with whom to have fun with? | 0 | 0 | 3 | 20 | 5 | 33.3 | 4 | 26.7 | 3 | 20 |
| Do you have someone with whom to relax? | 1 | 6.7 | 4 | 26.7 | 2 | 13.3 | 5 | 33.3 | 3 | 20 |
| Do you have someone with whom you can do something enjoyable? | 2 | 13.3 | 0 | 0 | 5 | 33.3 | 4 | 26.7 | 4 | 26.7 |
| Can you find companionship when you want it? | 1 | 6.7 | 4 | 26.7 | 4 | 26.7 | 3 | 20 | 3 | 20 |
| Do you have someone to keep you company at home? | 1 | 6.7 | 2 | 13.3 | 5 | 33.3 | 2 | 13.3 | 5 | 33.3 |
| Do you have someone to go with you to an event? | 0 | 0 | 2 | 13.3 | 6 | 40 | 4 | 26.7 | 3 | 20 |

A one-tailed, one-sample t-test was conducted to evaluate if companionship was greater for individuals with physical disabilities who owned service dogs when compared with the population mean for the PROMIS Companionship short form. For the purpose of this study, the population mean utilized was M=50, as reported in the instrument test manual (PROMIS, 2022). There was not a significant difference in the participants' companionship scores (M=47.173, SD=8.698) when compared with population mean for the instrument (M=50, sd=10) conditions; t(15)=-1.259, p=.114. The 95 percent confidence interval for the mean difference between the two means was 42.356 and 51.99. Results indicate that there was not a significant difference between the companionship levels of participants with physical disabilities who own service dogs when compared with the population mean for the instrument. Overall, since two out of the three instruments resulted in significant results, the null hypothesis for the social connectedness construct was rejected.

**Research Question 4: Does more time owning a service dog increase people with physical disabilities social connectedness?**

To examine research question four, a correlational analysis was conducted for each of the three PROMIS assessments utilized to explore participants' social connectedness. This correlational analysis explored the relationship between the time participants owned their service dogs and social connectedness, as measured by the PROMIS Ability to Participate in Social Activities adult short form, the PROMIS Social Isolation adult short form and the PROMIS Companionship adult short form. For the PROMIS Ability to Participate in Social Activities assessment, there was a positive correlation between participants' ability to participate in social activities and their length of service dog ownership, with $r(13)=.208$, $p=.456$. The coefficient of determination was $R^2=.043$. Results of this analysis indicate that there was a weak, positive correlation between participants' ability to participate in social activities and their length of service dog ownership. These results, however, were not statistically significant and there was not a statistically significant relationship between the two outcomes.

For the PROMIS Social Isolation assessment, there was a negative correlation between social isolation and length of service dog ownership, with $r(13)=.553$, $p=.033$. The coefficient of determination was $R^2=.305$. Results of this analysis indicate that there was a moderate, negative correlation between participants' social isolation and their length of service dog ownership, with individuals who owned service dogs for longer periods of time, experiencing less social isolation. These results indicate that the correlation was statistically significant and there was a statistically significant relationship between the outcomes.

For the PROMIS Companionship assessment, there was a positive correlation between companionship and length of service dog ownership, with $r(13)=.179$, $p=.523$. The coefficient of

determination was $R^2$=.032. Results of this analysis indicate that there was a weak, positive correlation between participants' companionship and their length of service dog ownership. These results, however, were not statistically significant and there was not a statistically significant relationship between the two outcomes. Overall, since two out of the three correlation analyses indicated there was not a significant relationship between outcomes, the null hypothesis for the social connectedness construct was accepted.

**Research Question 5: How does people with physical disabilities who own service dogs compare with the general public regarding their length of employment and employment satisfaction?**

When asked about their current employment, one participant (6.7%) reported being employed part-time, two individuals (13.3%) reported being employed full-time, two (13.3%) reported being self-employed, two participants (13.3%) reported being students, four (26.7%) reported being retired, and four individuals (26.7%) reported being unable to work. At the time of the study, no participants were employed by the military, unemployed, or unemployed due to reasons related to COVID-19. For the purposes of examining employment satisfaction and length of time employed, a sample of five (n=5) was utilized as there were five participants currently employed part-time, full-time, or self-employed at the time of the study. These five individuals were the only participants for the larger sample who completed the questions regarding length of time employed and employment satisfaction on the demographic questionnaire.

Of the five participants who were currently working, either part-time, full-time, or self-employed, four individuals (80%) had been employed by their current employer for four to five years and one participant (20%) has been employed with the same employer for over 10 years (20%). A one-tailed, one-sample t-test was conducted to evaluate if length of time employed was

longer for individuals with physical disabilities who owned service dogs when compared with the general public. For the purpose of this study, the average length of employment for the general population, reported by the Bureau of Labor Statistics (2020), was M=4.1 years. There was not a significant difference in the length of employment for individuals with physical disabilities who own service dogs (M=5.6, sd=2.46) when compared with the general population (M=4.1) conditions; t(5)=1.363, p=.122. The 95 percent confidence interval for the mean difference between the two mean lengths of employment was 2.546 and 8.654. Results indicate that individuals with physical disabilities had longer lengths of employment than the general public. This difference in length of employment, however, was not significant overall and the null hypotheses was accepted.

To explore employment satisfaction, employed participants were asked to rate their level of job satisfaction on a five-point Likert scale, ranging from Very Dissatisfied to Very Satisfied. Two participants (40%) rated their employment satisfaction as Neutral, one (20%) rated it as Satisfied, and two individuals (60%) reported their employment satisfaction as Very Satisfied. A one-tailed, one-sample t-test was conducted to examine the difference between the sample's job satisfaction and job satisfaction of employed individuals in the United States. For the purpose of this study, the satisfied was utilized as the population mean, as reported by Levanon and colleagues (2021). There was not a significant difference between employment satisfaction for individuals with physical disabilities who own service dogs (M=4, sd=1) when compared to the population mean (M=4) conditions; t(5)=0, p=.5. The 95 percent confidence interval for the mean difference between the average employment satisfaction was 2.758 and 5.242. Results indicate that individuals with physical disabilities who own service dogs reported the same

employment satisfaction as the general public. This means there was not a significant difference overall and the null hypothesis was accepted.

**Research Question 6: Does more time owning a service dog increase people with physical disabilities length of employment and employment satisfaction?**

To examine research question six, two correlational analysis were conducted. The first correlation analysis explored the relationship between the time participants owned their service dogs and their length of employment, as measured by information gathered on the demographic questionnaire. There was a positive correlation between length of employment and length of service dog ownership, with $r(3)=.645$, $p=.24$. The coefficient of determination was $R^2=.416$. Results of this analysis indicate that there was a moderate, positive correlation between length of employment and length of service dog ownership. These results indicate there was a correlation between the two outcomes, however, the correlation was not statistically significant and there was not a statistically significant relationship between the outcomes.

For employment satisfaction, data was collected using the demographic questionnaire. The second correlation analysis explored the relationship between participants' employment satisfaction and their length of service dog ownership. There was a positive correlation between Employment satisfaction and length of service dog ownership, with $r(3)=.976$, $p=.004$. The coefficient of determination was $R^2=.953$. Results of this analysis indicate that there was a very strong, positive correlation between employment satisfaction and length of service dog ownership. These results indicate that the correlation was statistically significant and there was a statistically significant relationship between the outcomes. Overall, for research question six, the null hypothesis was rejected, and the alternative hypothesis was accepted.

**Research Question 7: How does people with physical disabilities who own service dogs compare with the general public regarding their quality of life?**

The 16-item Flanagan Quality of Life Scale, or QOLS, was used as the instrument to measure overall quality of life in the current study and was the final portion of the electronic survey. The QOLS asks participants to rate their responses to statements on a seven-point Likert-scale, ranging from Delighted to Terrible. In terms of scoring, each response on the Likert-scale received a rating, with Delighted receiving a score of seven and Terrible receiving a score of one. Item responses are then totaled to provide an overall score for the instrument. Scores on the QOLS range from 16 to 112. Table 6 provides each question on the QOLS, along with a visual representation of participant responses on each item.

When examining responses for each item, nine participants (60%) responded as Pleased, two (13.3%) reported being Mostly Satisfied, three respondents (20%) indicated having Mixed Feelings, and one participant (6.7%) reported being Mostly Dissatisfied regarding their material comforts. As for health, one participant (6.7%) responded as being Pleased, two (13.3%) reported being Mostly Satisfied, five individuals (33.3%) indicated having Mixed Feelings, four participants (26.7%) reported being Mostly Dissatisfied, and three participants (20%) reported being Unhappy. Examining participants' relationships and communication with family members, one participant (6.7%) reported being Delighted, five individuals (33.3%) indicated they were Pleased, two (13.3%) responded as Mostly Satisfied, six participants (40%) reported Mixed Feelings, and one individual (6.7%) reported being Mostly Dissatisfied. When asked about having and rearing children, two participants (13.3%) reported being Delighted, seven respondents (46.7%) responded as Pleased, one person (6.7%) indicated being Mostly Satisfied,

two (13.3%) reported Mixed Feelings, one person (6.7%) responded as Mostly Dissatisfied, one participant (6.7%) indicated being Unhappy, and one (6.7%) responded Terrible.

As for close relationships with spouses or significant others, two participants (13.3%) reported being Delighted, three (20%) responded as Pleased, one person (6.7%) indicated being Mostly Satisfied, three individuals (20%) reported having Mixed feelings, five respondents (33.3%) indicated being Unhappy and one individual (6.7%) responded Terrible. In examining participants' close friendships, two individuals (13.3%) reported being Delighted, five individuals (33.3%) responded as Pleased, five (33.3%) indicated being Mostly Satisfied, two participants (13.3%) reported Mixed Feelings, and one person (6.7%) indicated they were Unhappy. Two participants (13.3%) indicated being Delighted, five individuals (33.3%) responded as Pleased, four (26.7%) reported being Mostly Satisfied, and four participants (26.7%) indicated Mixed Feelings in terms of their ability to help and encourage others, volunteer and give advice. When examining participation in organizations and public affairs, two participants (13.3%) reported being Delighted, three individuals (20%) responded as Pleased, four (26.7%) indicated being Mostly Satisfied, three participants (20%) reported Mixed Feelings, one participant (6.7%) indicated being Mostly Dissatisfied, one participant (6.7%) reported being Unhappy, and one participant (6.7%) responded  Terrible.

Examining learning, two participants (13.3%) indicated being Delighted, three individuals (20%) responded as Pleased, six (40%) reported being Mostly Satisfied, three participants (20%) indicated having Mixed Feelings, and one person (6.7%) reported being m\Mostly Dissatisfied. In terms of having a self-understanding of strengths and limitations, three participants (20%) reported being Delighted, three individuals (20%) responded as Pleased, three (20%) indicated being Mostly Satisfied, three participants (20%) reported Mixed Feelings, and

two individuals (13.3%) responded being Mostly Dissatisfied. For the item regarding self-understanding, one participant did not provide a response. The QOLS test manual indicated that for incomplete items scores, the mean response on the Likert-scale (i.e., mixed) was attributed to the item. When asked about their work, whether in a workplace or at home, two participants (13.3%) reported being Delighted, five individuals (33.3%) responded as Pleased, one person (6.7%) reported being Mostly Satisfied, four participants (26.7%) indicated having Mixed Feelings, and three (20%) responded as Mostly Dissatisfied.. As for creative self-expression, two participants (13.3%) indicated being Delighted, four individuals (26.7%) responded as Pleased, three (20%) reported being Mostly Satisfied, three individuals (20%) indicated having Mixed Feelings, two participants (13.3%) reported being Mostly Dissatisfied, and one person (6.7%) responded Terrible.

In terms of socializing, four participants (26.7%) responded as Pleased, five individuals (33.3%) reported being Mostly Satisfied, two (13.3%) indicated Mixed Feelings, two participants (13.3%) reported being Mostly Dissatisfied, and two people (13.3%) responded Terrible. Four participants (26.7%) reported being Delighted, six individuals (40%) responded as Pleased, three (20%) indicated being Mostly Satisfied, and two participants (13.3%) reported having Mixed Feelings regarding their engagement in reading, listening to music and observing entertainment. Examining participation in active recreation, one participant (6.7%) indicated being Delighted, four individuals (26.7%) responded as Pleased, two (13.3%) reported being Mostly Satisfied, three participants (20%) indicated having Mixed Feelings, three individuals (20%) reported being Mostly Dissatisfied, one person (6.7%) indicated being Unhappy, and one participant (6.7%) responded Terrible. Finally, four individuals (26.7%) reported being Delighted, three participants (20%) responded as Pleased, two (13.3%) indicated being Mostly Satisfied, three

participants (20%) reported having Mixed Feelings, one person (6.7%) indicated being Mostly Dissatisfied, one (6.7%) reported being Unhappy, and one participant (6.7%) responded Terrible regarding their independence.

Table 6

| Item | Delighted | | Pleased | | Mostly Satisfied | | Mixed | | Mostly Dissatisfied | | Unhappy | | Terrible | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % | N | % | N | % | N | % |
| Material comforts | 0 | 0 | 9 | 60 | 2 | 13.3 | 3 | 20 | 1 | 6.7 | 0 | 0 | 0 | 0 |
| Health | 0 | 0 | 1 | 6.7 | 2 | 13.3 | 5 | 33.3 | 4 | 26.7 | 3 | 20 | 0 | 0 |
| Relationships with family | 1 | 6.7 | 5 | 33.3 | 2 | 13.3 | 6 | 40 | 1 | 6.7 | 0 | 0 | 0 | 0 |
| Having and rearing children | 2 | 13.3 | 7 | 46.7 | 1 | 6.7 | 2 | 13.3 | 1 | 6.7 | 1 | 6.7 | 1 | 6.7 |
| Close relationships with spouse | 2 | 13.3 | 3 | 20 | 1 | 6.7 | 3 | 20 | 0 | 0 | 5 | 33.3 | 1 | 6.7 |
| Close friends | 2 | 13.3 | 5 | 33.3 | 5 | 33.3 | 2 | 13.3 | 0 | 0 | 1 | 6.7 | 0 | 0 |
| Helping and encouraging others, volunteering, giving advice | 2 | 13.3 | 5 | 33.3 | 4 | 26.7 | 4 | 26.7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Participating in organizations and public affairs | 2 | 13.3 | 3 | 20 | 1 | 6.7 | 3 | 20 | 1 | 6.7 | 1 | 6.7 | 1 | 6.7 |
| Learning | 2 | 13.3 | 3 | 20 | 6 | 40 | 3 | 20 | 1 | 6.7 | 0 | 0 | 0 | 0 |
| Understanding yourself | 3 | 20 | 3 | 20 | 3 | 20 | 3 | 20 | 2 | 13.3 | 0 | 0 | 0 | 0 |
| Work | 2 | 13.3 | 5 | 33.3 | 1 | 6.7 | 4 | 26.7 | 3 | 20 | 0 | 0 | 0 | 0 |
| Expressing yourself creatively | 2 | 13.3 | 4 | 26.7 | 3 | 20 | 3 | 20 | 2 | 13.3 | 0 | 0 | 1 | 6.7 |
| Socializing | 0 | 0 | 4 | 26.7 | 5 | 33.3 | 2 | 13.3 | 2 | 13.3 | 0 | 0 | 2 | 13.3 |
| Reading, listening to music or observing entertainment | 4 | 26.7 | 6 | 40 | 3 | 20 | 2 | 13.3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Participating in active recreation | 1 | 6.7 | 4 | 26.7 | 2 | 13.3 | 3 | 20 | 3 | 20 | 1 | 6.7 | 1 | 6.7 |
| Independence | 4 | 26.7 | 3 | 20 | 2 | 13.3 | 3 | 20 | 1 | 6.7 | 1 | 6.7 | 1 | 6.7 |

A one-tailed, one-sample t-test was conducted to evaluate if overall quality of life for individuals with physical disabilities who owned service dogs was higher when compared with the population mean for the QOLS. According to Burckhardt & Anderson (2003), the average score on this instrument was M=90 for a healthy population and M=83 for individuals with

rheumatoid arthritis. Since the current study was examining the quality of life for individuals with physical disabilities, a population mean of M=83 was utilized, as rheumatoid arthritis is considered a physical disability and more closely representants the current study's sample. There was not a significant difference in the quality of life scores for individuals with physical disabilities who own service dogs (M=77.4, sd=15.412) when compared with population mean for the instrument (M=83) conditions; t(15)=-1.407, p=.091. The 95 percent confidence interval for the mean difference between the two mean was 68.865 and 85.935. Results indicate that individuals with physical disabilities who own service dogs reported lower levels of quality of life when compared with other individuals who have physical disabilities and completed the QOLS. This difference in quality of life, however, was not significant overall and the null hypotheses was accepted.

**Research Question 8: Does more time owning a service dog increase people with physical disabilities quality of life?**

To examine research question eight, a correlational analysis was conducted. This correlational analysis explored the relationship between the time participants owned their service dogs and quality of life, as measured by the 16-item Flanagan Quality of Life Scale. There was a positive correlation between participants' quality of life and their length of service dog ownership, with r(13)=.1.69, p=.548. The coefficient of determination was $R^2$=.028. Results of this analysis indicate that there was a weak, positive correlation between participants' quality of life and their length of service dog ownership. Based on the results, there was not a significant relationship between length of service dog ownership and quality of life and the null hypothesis for research question two was accepted.

## Summary

The current study was conducted to explore the impact of service dogs on activities of daily living, social connectedness, employment and quality of life for individuals with physical disabilities. To answer the research questions, a cross-sectional survey research design was utilized with an electronic survey that included a demographic questionnaire, the PSMS-Self, the PROMIS Ability to Participate in Social Activities adult short form, the PROMIS Social Isolation adult short form, the PROMIS Companionship adult short form, and the 16-item Flanagan QOLS. Results from this study indicate that there was a significant, positive difference between individuals with physical disabilities who own service dogs with respect to independence in completing activities of daily living when compared to the general public for the PSMS-Self. This resulted in the null hypothesis being rejected for research question one. Exploring the relationship between independence in completing activities of daily living and length of service dog ownership, results of the correlation analysis indicate that there was a weak, positive correlation. There was not a significant relationship between the two outcomes and the null hypothesis for research question two was accepted.

Analysis of the responses on the instruments utilized to evaluate social connectedness indicate that there was a significant, negative difference between individuals with physical disabilities who own service dogs when comparted with the general public for both instruments measuring ability to participate in social activities and social isolation. There was not a significant difference between participants and the general public in terms of companionship. Due to two of the three PROMIS assessments producing significant results, the null hypothesis for question three was rejected. Exploring the relationship between social connectedness and length of service dog ownership, results of the correlation analyses indicate that there were weak,

positive correlations and there were not significant relationships between ability to participate in social activities and length of service dog ownership, as well as between companionship and length of service dog ownership. There was a moderate, negative correlation and statistically significant relationship between participants' social isolation and their length of service dog ownership, with social isolation decreasing as length of service dog ownership increases. Due to two of the three PROMIS assessments producing insignificant results, the null hypothesis for research question four was accepted.

In terms of employment, results indicate that there was not a significant difference in employment satisfaction and length of employment for individuals with physical disabilities who own a service dog when compared with the general public in the United States. This resulted in the null hypothesis for research question five being accepted. Exploring the relationship between employment satisfaction and length of service dog ownership, results of the correlation analysis indicate that there was a very strong, positive correlation and a statistically significant relationship between the two outcomes. Additionally, there was a moderate, positive correlation between participant's length of employment and their length of service dog ownership. This correlation, however, was not statistically significant. Overall, for research question six was accepted, indicating a correlation between length of employment and length of service dog ownership.

Finally, results of the study indicate that there was not a significant difference between individuals who own service dogs when compared to others with physical disabilities regarding their overall quality of life, as measured by the 16-item Flanagan QOLS. This resulted in the null hypothesis for research question seven being accepted. Exploring the relationship between quality of life and length of service dog ownership, results of the correlation analysis indicate

that there was a weak, positive correlation. This correlation, however, was not a significant relationship between the two outcomes and the null hypothesis for research question eight was accepted. Chapter IV provides a discussion of the results, limitations of the overall study, and implications for future research.

## Chapter IV. Discussion

Over 500,000 Americans with disabilities use service dogs to assist them in completing specifically trained tasks, such as retrieving items, opening doors, altering others during seizures, and providing mobility assistance (Crowe et al., 2014; Levey & Chappy, 2017; Muramatsu et al., 2015; O'Haire & Rodriquez, 2018; Rintala et al., 2002; Trainer, 2016) and that number will continue to increase. While the primary benefit of service dogs is the task the dogs are specifically trained to perform for their handlers, research indicates that there are a number of secondary benefits associated with owning a service dog (Allen & Blascovich, 1996; Camp, 2011; Carr et al., 2018; Hall et al., 2017; Lundqviat et al., 2019; McIver et al., 2020; Rintala et al., 2002). Secondary benefits include improved performance of activities of daily living (Crowe et al., 2014; Hall et al., 2017; Levey & Chappy, 2017; Rintala et al., 2002), increased rates of employment (Crowe et al., 2014; Thorne et al., 2017; Yount et al., 2013), greater social connectedness (Champagne et al., 2016; Crowe et al., 2014; Guest et al., 2006; Hicks & Weisman, 2015; McNicholas & Collis, 2000), and improved self-perceptions of quality of life (Camp, 2001; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002; Rodriquez et al., 2019). The human-canine bond is considered strong, universal emotional connection between humans and dogs that allow for service dogs to holistically and positively impact their handlers' lives beyond merely the task they are trained to complete (Hicks & Weisman, 2015; Maharaj et al., 2016; Walsh, 2009).

Specifically, research indicates that when people have a service dog that is trained to assist with completion of activities of daily living, those individuals report a secondary benefit of an increased sense of independence (Carr et al., 2018; Crowe et al., 2014; Hall et al., 2017; Rintala et al., 2002; Thorne et al., 2017; Winkle et al., 2011). The increased sense of

independence, then increases the likelihood that the individual will engage in social activities when compared with other individuals with disabilities who do not have service dogs (Carr et al., 2018; Lundqvist et al., 2018; Rintala et al., 2002; Sanders, 2000; Yount et al., 2013). Additionally, research indicates that when compared with individuals with disabilities who do not own service dogs, individuals who own services dogs are more likely to be employed and are less likely to take time off work due for health-related concerns (Groomes et al., 2014; Hall et al., 2017; Refson et al., 1999; Thorne et al., 2017). Finally, research indicates that overall, people who own service dogs report more positive perceptions of their quality of life when compared to individuals with disabilities who do not own service dogs (Camp, 2001; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002; Rodriquez et al., 2019).

Due to the numerous secondary benefits service dogs provide to handlers, service dogs could be a viable and holistic intervention for individuals with physical disabilities who face a number of unique barriers in their daily lives, such as discrimination, inaccessible spaces, and a decreased sense of independence (Chow et al., 2005; Dorstyn et al., 2011; Lumsdaine & Thurston, 2017; Nevala et al., 2015 Ochoa-Morales et al., 2019; Repke & Ipsen, 2019). These unique barriers can result in decreased social connectedness, limited employment opportunities and a reduced sense of quality of life for individuals with physical disabilities (Chow et al., 2005; de la Vega et al., 2019; Lorefice et al., 2018; Lumsdaine & Thurston, 2017; Nevala et al., 2015; Shapiro & Martin, 2014). Service dogs, therefore, could positively impact multiple areas of daily functioning and improve overall quality of life for people with disabilities.

Research, however, is still scare regarding the secondary benefits of service dogs for individuals with diverse disabilities. While the secondary benefits of service dogs have been examined for individuals with specific disabilities, such as diabetes, epilepsy, hearing loss, and

severe ambulatory disabilities, this research is disability specific and limited for the broader group of individuals with diverse physical disabilities. In addition to previous research being disability specific, the research also tends to examine only one secondary benefit construct, such as employment, social connectedness, or quality of life (Glenn, 2013; Hall et al., 2017; Hicks & Weisman, 2015; Lundqviat et al., 2018; McIver & Mills, 2020; Rodriquez et al., 2019; Rudastam et al., 2012). Previous research on the benefits of service dogs is also limited in the fact that many studies have smaller sample sizes and less diverse participants, impacting the generalizability for findings. While this research is valuable in that it provides a valuable foundation for understanding the secondary benefits of service dogs, additional research, however, is still required to provide further validation regarding the effectiveness of service dogs as a holistic intervention and a fuller understanding of the numerous secondary benefits service dogs provide to their handlers.

As established through previous studies, service dogs can impact independence in completing activities of daily living, (Crowe et al., 2014; Hall et al., 2017; Levey & Chappy, 2017; Rintala et al., 2002), employment (Crowe et al., 2014; Thorne et al., 2017; Yount et al., 2013), social connectedness (Champagne et al., 2016; Crowe et al., 2014; Guest et al., 2006; Hicks & Weisman, 2015; McNicholas & Collis, 2000), and quality of life (Camp, 2001; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002; Rodriquez et al., 2019) for individuals with physical disabilities. Due to the limited literature regarding the benefits of service dogs for individuals with physical disabilities, the current study contributed to the empirical understanding of the benefits of using services as a holistic intervention.

The current study aimed to empirically examine the impact service dogs have on individuals with physical disabilities regarding their activities of daily living, social connection,

employment, and quality of life. To achieve the study's goal and answer the research questions that guided the development of this study, a cross-sectional survey research design was utilized. Data was collected using an online survey published on Qualtrics. One-hundred and thirteen organizations that provide service dogs to individuals with physical disabilities across the United States were contacted by email and/or telephone and were provided with information regarding the study, as well as a request to distribute the electronic survey to their service dog constituents. Upon agreeing to disseminate the electronic survey, service dogs organizations were required to complete and return a site authorization letter before receiving the recruitment flyer that could be sent to constituents.

Individuals were eligible to participate in the study if they (a) were at least 19 years old, (b) were able to read English, (c) had internet access, (d) had been diagnosed with a physical disability, and (e) owned a service dog or were on a waiting list to receive a service dog. Sixteen participants self-selected to participate in the study and provided consent before completing the electronic survey. The electronic survey consisted of a demographic questionnaire, the PSMS-Self, the PROMIS Ability to Participate in Social Activities adult short form, the PROMIS Social Isolation adult short form, the PROMIS Companionship adult short form, and the 16-item Flanagan QOLS. For the purposes of the current study, only 15 participant responses were analyzed as one participant reported having primary and secondary disabilities that could not be categorized as a physical disability, therefore, they did not meet eligibility criteria. Data analysis occurred in three phases. First, demographic information was analyzed using descriptive statistics to provide a picture of participant characteristics. Second, seven one-tailed, one-sample t-tests were conducted to compare the four constructs examined in the study (i.e., activities of daily living, social connectedness, employment, and quality of life) between individuals with

physical disabilities who own a service dog and the general public. Finally, seven correlation analyses were conducted to explore the relationship between length of service dog ownership and the four study constructs.

The current chapter presents and discusses the findings of the study in terms of the four study constructs. Additionally, limitations of the study, including the recruitment process and methods, study design, participant characteristics and sample size, are discussed, as well as strategies to address these limitations in future studies. Finally, implications for future research are presented.

## Findings

Service dogs are often trained to assist individuals with disabilities in completing activities of daily living, such as retrieving hygiene items, assisting with transferring out of bed, and ambulating around environments (Crowe et al., 2014; Levey & Chappy, 2017; Rintala et al., 2008). The benefit of increased independence in completing activities of daily living fosters a number of secondary benefits, such as increased self-esteem and independence, as well a reduced need for paid and unpaid assistance, which, in turn, can increase financial security (Allen & Blascovich, 1996; Hall et al., 2017; Lane et al., 1998; Lundqvist et al., 2019; Rintala et al., 2008; Rodriquez et al., 2019). Research question one sought to explore participants' independence in completion of activities of daily living, as measured by the PSMS-Self assessment. Results indicated that participants with service dogs had an above average level in their ability to complete activities of daily living (M=4.8). Examining specific activities of daily living, all participants (n=15, 100%) reported being able to eat and care for their own appearance completely independently. This finding may be due to the fact that participants reported disabilities that would primarily effect ambulation and mobility (e.g., amputation, spinal cord

injury, epilepsy, etc.), not necessarily the fine motor skills required for feeding and maintaining appearance.

The remaining four activities of daily living all had at least three participants report that they required some assistance in completion. The item responses did not specify if the assistance that the participants received was from another individual or if their service dogs were assisting them in completing the various activities. Interestingly, the item that most participants indicated they needed some assistance with was moving around their home environments (n=7, 46.7%). The item response "with some help" specified that help could be in the form of an assistive device (i.e., walker, crutches, or wheelchair) or a service dog, but participants did not have the opportunity to specify the manner through which they received assistance. Because individuals with physical disabilities often have service dogs trained to assist with ambulation, this finding could likely be due to the fact that participants were reporting the mobility assistance their service dog provides. Overall, participants reported a significant difference in their ability to complete activities of daily living and confirms the findings of previous literature that reported that service dogs assist their handlers in increasing their independence in completing activities of daily living (Allen & Blascovich, 1996; Hall et al., 2017; Lane et al., 1998; Lundqvist et al., 2019; Rintala et al., 2008; Rodriquez et al., 2019).

The second research question was developed to examine the relationship between participants' independence in completing activities of daily living and their length of service dog ownership. There was a weak, positive correlation and the relationship between the two outcomes were not statistically significant. Due to the complexity of disabilities, there could have been a number of confounding variables impacting the relationship between length of service dog ownership and independence in completing activities of daily living. For example,

the primary task that the service dog is trained to assist their handler with could impact the relationship between the two outcomes. If the service dog is trained to assist their handler with mobility but not with feeding, length of ownership will not impact the person's ability to feed themselves since the dog is not trained to provide assistance with that activity of daily living. Additionally, because the scoring on the instrument utilized in the present study did not differentiate between total dependence and requiring some assistance, the results may have been impacted for individuals reporting that their dogs provide them with some assistance in completing activities of daily living that they are unable to complete independently. For participants who report requiring some assistance in completing activities of daily living, it is expected their scores would not change as their length of service dog ownership increases, as their dog will continue providing some assistance and their responses would change only if they were able to complete activities of daily living completely independently. Future research would benefit from in depth explorations of the ways in which service dogs assist their handler's independence in completing activities of daily living.

The third research question was developed to explore the impact service dogs have on the social connectedness of their handlers. Individuals with physical disabilities face a number of attitudinal and environmental barriers that can negatively impact their engagement in social activities and relationships (Champagne et al., 2016). Previous literature indicates that service dogs provide their handlers with a number of secondary benefits in terms of social connectedness (Carr et al., 2018; Champagne et al., 2016; Crowe et al., 2014; Guest et al., 2006; Hicks & Weisman, 2015; McNicholas & Collis, 2000). For example, individuals with service dogs report they are more likely to be engaged in community activities due to their increased sense of independence and self-efficacy, as well as engage with others in their community when

compared with individuals with disabilities who do not own service dogs (Carr et al., 2018; Guest et al., 2006; Lundqvist et al., 2018; Rintala et al., 2002; Sanders, 2000; Yount et al., 2013).

In the present study, social connectedness was examined in terms of three constructs: ability to participate in social activities, social isolation, and connectedness. All three constructs were measured using PROMIS instruments. Examining the ability to participate in social activities, participants reported lower levels of participation (M=42.213) when compared with the population mean for the PROMIS Social Isolation short form (M=50). The area of most difficulty participants (n=4; 26.7%) indicated having was having to limit the activities they participate in with others for fun. Completing leisure and family activities were the two items that most participants (n=2; 13.3%) reported the least difficulty in completing. Most item scores, however, indicated that participants sometimes had difficulty completing all activities assessed. An overall significant difference was found between the ability to participate in social activities for participants with physical disabilities who own service dogs when compared with the population mean for the instrument. This difference, however, was in the negative direction, indicating that participants overall reported significantly lower abilities to participant in social activities.

In terms of social isolation, participants reported higher levels (M=54.667) of social isolation when compared with the population mean for the PROMIS Social Isolation short form (M=50). A majority of participant responses fell between Never and Sometimes on the Likert-scale for each of the eight items, indicating that most participants felt some level of social isolation. The items in which participants indicated the least social isolation included feeling that others barely know them (n=4; 26.7%). The areas in which participants experienced the most social isolation was regarding feelings of being left out, with a majority of participants (n=13;

86.7%) reporting Sometimes and Usually. Overall, there was a significant difference between the perceived social isolation of participants when compared with the population mean for the instrument. This finding, however, indicates that participants experienced more social isolation when compared with the general public.

Examining companionship, participants reported lower levels (M=47.173) when compared with the population mean for the PROMIS Companionship short form (M=50). For all items, most participant responses fell between Rarely and Always on the Likert-scale, indicating that most participants had some level of companionship. Participants reported the most difficulty being able to find companionship when desired, with nine participants responding never, rarely or sometimes for this item (60%). Having company at home was rated the highest for the assessment amongst participants (n=5; 33.3%). While participants overall reported lower levels of companionship when compared with other who completed the PROMIS Companionship short form, these results did not produce a significant difference.

Overall, for research question three, there was a significant difference found on two of the three instruments used to assess social connectedness. These findings, however, indicated that participants had less ability to participate in social activities, experienced more social isolation and have less companionship when compared with other who took the assessments, which points to a lower sense of social connectedness in general for participants. An important factor to consider when examining these results was the social environment present during the time of the study. The study was conducted in 2021, a year after the coronavirus pandemic commenced. During the pandemic, research indicates that social isolation and loneliness increased for the general public due to lockdowns and precautions taken to prevent the spread of the virus (Banerjee & Rai, 2020; Murayama et al., 2021). This was especially true for individuals

with disabilities, as they are in a high-risk category for experiencing negative and more life-threatening symptoms of the virus (National Council on Disability, 2021). It was important to consider the impact the pandemic had on the social connectedness construct of the current study and future research should consider reexamining this construct as the effects of the pandemic continue to diminish.

The fourth research question was developed to examine the relationship between participants' social connectedness and their length of service dog ownership. Results of the correlation analyses indicate that there were weak, positive correlations and there were not significant relationships between participants' ability to participate in social activities and their length of service dog ownership, as well as between companionship and length of service dog ownership. In terms of social isolation, there was a moderate, negative correlation and statistically significant relationship between participants' social isolation and their length of service dog ownership. The results indicate that social isolation decreases as length of service dog ownership increases. Interestingly, there was a correlation between social isolation and length of service dog ownership but not between companionship or ability to participate in social activities and length of service dog ownership. While COVID-19 may have also impacted participants' ability to participate in social activities, as previously discussed, additional confounding variables must have impacted the relationship between social isolation and companionship and length of service dog ownership. Companionship and participating in social activities are typically utilized for the prevention of social isolation, so the findings of the present study are surprising given the fact that only social isolation was related to length of service dog ownership. Social connectedness is a complex construct that consists of many facets. It is interesting that one aspect of social connectedness was related to length of service dog

ownership, but the other variables examined were not related. Additional research could benefit from a more thorough exploration of the multiple facets that impact a service dog owner's social connectedness.

The fifth research question was developed to explore the impact service dogs have on their handlers' employment. In the realm of employment, recent studies have shown that owning a service dog is linked to increased employment rates for individuals with disabilities, a population that historically has lower employment rates than their peers without disabilities (Groomes et al., 2014; Hall et al., 2017; United States Department of Labor, 2018). Additionally, because secondary benefits of service dogs typically include an overall improvement in physical and mental health, employees with service dogs tend to require less time off work for health-related concerns (Refson et al., 1999; Thorne et al., 2017). Not only does the service dog benefit their handler, but other employees also experience benefits of having a service dog in the workplace, such as an increased sense of safety and decreased stress, which is shown to foster positive interactions between co-workers (Crowe et al., 2014; Thorne et al., 2017; Yount et al., 2013).

The present study sought to explore participants' employment through research question three. The demographic questionnaire captured participants' employment status and if employed, their employment satisfaction and length of time employed. Of the 15 participants in the study, five of the participants (33.3%) were employed either employed part-time, full-time, or self-employed. The reminder of participants were either still in school, retired, or unable to work. Of the individuals employed, participants were employed with their current employer from four to over 10 years with an average of 5.6 years. Results indicated that participants had been employed with their current employer longer than the general public in the United States (M=4.1) (Bureau

of Labor Statistics, 2020) and this difference in length of employment was not statistically significant.

In terms of employment satisfaction, participants responses ranged from Neutral to Very Satisfied, with the sample average reflecting participants were satisfied (M=4) with their work. The sample average was in line with the national employment satisfaction level (Levanon et al., 2021). As the sample mean and the population mean were the same, a significant difference was not observed in terms of employment satisfaction. Due to the small sample size and limited questions exploring employment satisfaction, as well as other factors that impact employment (i.e., availability of transportation, job availability, etc.) additional research is needed to further explore the impact of service dogs on employment for individuals with physical disabilities.

The sixth research question was developed to examine the relationship between participants' length of employment and employment satisfaction and their length of service dog ownership. Results indicate that there was a very strong, positive correlation and a statistically significant relationship between employment satisfaction and length of service dog ownership. There was a moderate, positive correlation between participant's length of employment and their length of service dog ownership, however, this correlation was not statistically significant. It is important to consider the small sample size when examining the relationship between the employment variables and length of service dog ownership. Having a sample size of five participants for the employment construct could have impacted the results of the correlation and impacted the generalizability of the findings. It will be important for future researcher to further examine the relationship between employment satisfaction and length of service dog ownership to validate the findings of the present study. Additionally, having a larger sample size could further confirm if the moderate, positive correlation observed in the relationship between length

of employment and length of service dog ownership is statistically significant when more service dogs owners are surveyed. Conducting further regarding the relationship between employment and length of service dog ownership will further validate the use of service dogs a holistic intervention to improve employment outcomes for individuals with physical disabilities.

Research question seven was developed to examine the overall quality of life for individuals with physical disabilities who own service dogs. Quality of life is comprised of a number of factors, such as independence, employment and quality of relations, and for individuals with disabilities, implications of their disability (i.e., decreased self-efficacy, negative perceptions of employment and social achievement, and reduced independence) can negatively impact their perceptions of quality of life (Carr et al., 2018; Groomes et al., 2014; Hall et al., 2017; McIver et al., 2020). By increasing their handlers' independence in completing activities of daily living, social connectedness, and success in the workplace, service dogs have the ability to increase their handlers' overall quality of life (Camp, 2001; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002; Rodriquez et al., 2019).

Results of the QOLS indicate that participants in this study had a lower perception of quality of life (M=77.4) when compared with other individuals with physical disabilities who completed the assessment. Responses for each of the 16 items primarily fell between Pleased and Mixed on the seven-point Likert-scale. Participants indicated the most dissatisfaction in terms of their health, with seven participants (46.7%) indicated either Mostly Dissatisfied or Unhappy for this item. Given the fact that individuals with disabilities tend to have more negative perceptions of their general health, this finding was not surprising (Groomes et al., 2014; Hall et al., 2017; Refson et al., 1999; Thorne et al., 2017). Previous studies do indicate, however, that individuals with service dogs report higher perceptions of general health when compared to other with

disabilities (Groomes et al., 2014; Hall et al., 2017; Refson et al., 1999; Thorne et al., 2017). The findings of this study indicate a need for more research to be conducted to fully explore the impact service dogs have on their handlers' overall health.

Reading, listening to music and observing entertainment was rated most positively by participants on the QOLS, with 13 participants (86.7%) reporting being Delighted to Mostly Satisfied. The two remaining participants reported Mixed Feelings, so there were no responses on the negative side of the Likert-scale. This finding was not surprising as these activities tend to be completed alone can occur home setting. An unexpected finding, however, was the response to close friends on the QOLS. This item received the second highest ratings in terms of satisfaction, with 12 participants (80%) reporting being Delighted to Mostly Satisfied. Of the three remaining participants, two participants (13.3%) reporting Mixed Feelings and one (6.7%) indicating being Unhappy. This finding was surprising, given the results of the PROMIS Companionship short form results. Responses on the PROMIS Companionship short form indicated more negative perceptions regarding their ability to have companionship when desired and having someone with whom they could relax or have fun with. Since most participants reported having close friends but also indicated more negative perceptions of their companionship, additional research could explore how individuals with physical disabilities who own service dogs perceive their friendships and how their friendships impact their social connections.

Overall, the results of the QOLS indicate that individuals in the current study with physical disabilities who own service dogs perceived had more negative perceptions of their quality of life when compared with other individuals with physical disabilities who completed the instrument. This difference, however, was not statistically significant. There is, therefore, a

need for additional research to explore each construct that comprises overall quality of life is needed to fully understand the impact service dogs have on their handlers' lives.

Finally, research question eight was developed to examine the relationship between participants' quality of life and length of service dog ownership. Results of the correlation analysis between quality of life and length of service dog ownership indicate that there was a weak, positive correlation. This correlation, however, was not a significant relationship between the two outcomes. Much like social connectedness, quality of life is comprised of multiple, complex facets, increasing the change of confounding variables existing that impact the relationship between quality of life and length of service dog ownership. Research could benefit from an exploration of which aspects of quality of life are related to length of service dog ownership. Additionally, conducting future research with a larger sample size could further validate the trends in length of service dog ownership and quality of life. This may require conducting a longitudinal study since quality of life is an individualized concept as people place different meaning and value into the various aspects that constitute overall quality of life. Conducting future research would allow for further validation of the use of service dogs as an individualized and holistic intervention for individuals with physical disabilities.

## Limitations of the Study

As with all research, the current study has a number of limitations, including a lack of participant diversity, the recruitment process, the distribution method, the study design, external environmental factors present during data collection, and the low response rate. These limitations impacted the study and the recruitment process and external environmental factors potentially contributed to the low response rates from both service dog organizations and their constituents. Due to the low response rate, as seen in previous similar studies, and unforeseeable

circumstances (i.e., COVID-19), the researcher adapted the research process (e.g., recruitment methods and adapting the study to a pilot study) to best address the limitations as they arose during data collection while maintaining the integrity of the study. The limitations of the current study also provided the researcher with insight into methods to improve future research on the topic.

The first primary limitation of the study was the lack of participant diversity. While participants were diverse in their primary and secondary disabilities, their ages, their educational backgrounds, marital status, employment status, length of time owning a service dog, and previous service dog ownership, there were still a number of characteristics in which they were much less diverse. Specifically, there was a disproportionate number of study participants who identify as female and who identify as Caucasian/White. Additionally, despite the researcher contacting service dogs organizations across the nation, the majority of participants (n=10, 66.7%) resided in the Midwest and there were no participants from the South. This finding may be due to the fact that the Midwest was the largest geographical category listed and therefore, more service dog organizations were located within that area. As for length of time employed, a majority of the employed participants (n=4; 80%) had been employed for four to five years. Finally, all participants (n=15; 100%) currently owned a service dog. This finding greatly impacted the current study, as the current study originally intended to compare the four study constructs between individuals who owned service dogs and individuals on a waiting list to receive a service dog. Due to the lack of diversity in service dog ownership, the researcher adapted the analytic strategies of the present study to account for participant ownership of service dogs. The lack of diversity in some participant characteristics reduced the generalizability of the study findings. In future research, it will be important to have more

diversity amongst participants in all characteristics to increase the generalizability of the findings.

The participant recruitment process, as approved by the Auburn University Institutional Review Board, or IRB, was the second major limitation of the study. The recruitment process required the researcher to obtain a completed site authorization letter from each organization indicating that the organization would send the recruitment email and flyer to their constituents. Once the site authorization was obtained, the researcher was required to submit an IRB modification to the IRB containing each site authorization letter and obtain approval before sending the recruitment email and flyer to the organizations for distribution to their constituents. A total of six IRB submissions were filed and approval took anywhere from one week to one month to receive.

This recruitment process imposed limitations that potentially impacted the data collection process. Specifically, it impacted the researcher's responsiveness to service dog organization representatives. The researcher responded to all communications from service dog organization representatives within one business day, however, the time between receipt of the site authorization letter and sending the organization representative the recruitment email and flyer to distribute to constituents varied up to one month depending on the length of time for IRB approval. Organizations with longer wait periods had the most potential to negatively impact the study. For example, in the month it took to receive the recruitment email and flyer, the organization representation could have left the organization, or the organization could have discontinued services, especially given the circumstances surrounding the coronavirus pandemic. Additionally, organization representatives' motivation to distribute the survey could have decreased during that time as opposed to if they were immediately sent the recruitment email and

flyer after returning the completed site authorization letter to the researcher. While the researcher cannot account for the time it takes the IRB to approve each modification, in future studies, the researcher could send follow up emails or make follow up calls while the modifications are being approved to provide organization representatives with periodic updates. This would allow the researcher to maintain more open lines of communication, resulting in more information regarding organizational, personnel and other factors that impact the data collection process.

In a similar vein, the recruitment method used potentially created a third limitation in the current study. In an effort to expedite communication with all 113 service dog organizations, the researcher chose email as the initial and primary method of communication. Telephone communication was ultimately employed at the end of the data collection process however, the researcher began the data collection process utilizing email to make contact with all service dog organizations listed in Appendix A. Both communication methods, however, have benefits and limitations that impacted the study. Electronic communications take a relatively short period of time to complete, allowing for more organizations to be contacted per day (Dash et al., 2016). Additionally, email communications allowed the researcher to directly send the site authorization letter as a part of the initial contact, as compared to having a phone conversation and then sending the site authorization letter in a follow up email. Communicating through email also provided the researcher with a digital record of all correspondence. Finally, emails did not require the recipient to be present at the time of the contact and allowed organization representatives to respond when they had time to dedicate to the task.

While electronic communication took less time to complete and allowed the researcher to quickly provide all service dog organizations with information and the site authorization letter, security features within email carriers, such as spam filters, could have prevented organization

representatives from ever receiving the contact attempt. Additionally, organization representatives could have screened and deleted the email based on the subject line, before reading the email body and truly understanding the purpose of the study. Finally, organization representatives could have read the email, with or without the intent to reply, and never responded since the email is marked a read and no longer notifies the representative that they have not replied.

On the other hand, phone communications are more personal than emails, since phone calls provide human-to-human contact and allowed the researcher to more accurately gauge organization representatives' verbal and nonverbal communications and respond accordingly (Dash et al., 2016). Phone calls also allowed for real-time conversation, where the researcher answered organization representatives' questions as they arose. The main limitation of phone communications is the time it takes to complete the calls, resulting in fewer organization contacts each day. Limitations of phone communications also occur if the organization representative does not pick up. During the recruitment process of the current study, the researcher left voice messages for each of eight organizations that did not answer. To the researcher's knowledge, only two organization representatives, however, returned the researcher's call. Additional organization representatives may have returned the call while the researcher was unavailable and decided to not leave a message. The organization representatives calls could have also been screened by the organization representative due to the research calling from an unknown number.

When conducting future research, the researcher can more effectively integrate both electronic and phone communications to improve the recruitment process. Specifically, the email contacts could be initiated with less time between each contact (e.g., sending follow-up emails within two weeks of the initial contact as opposed to months between the initial contact and

follow-ups). Following the email attempts, the researcher could create a system to contact all remaining organizations by phone. This would allow for the researcher to remain in more constant contact with organization representatives and possible increase the response rate.

As discussed in Chapter II, the study design possessed several limitations. First, the self-report design posed a threat to the internal validity of the study due to the fact that a non-probability sampling method was used, and the independent variable was not manipulated. Additionally, self-selection bias may have occurred due to the study having a nonprobability sample. Finally, social desirability may have occurred due to the use of self-report surveys, which potentially negatively impacts the internal validity of the study.

As previously discussed, during the data collection process, the COVID-19 pandemic was occurring, which could have negatively impacted response rates in several ways. COVID-19 impacted people with disabilities in a number of unique ways. Specifically, while many people during the pandemic experienced increased feelings of isolation, anxiety and depression, individuals with disabilities faced compounding barriers and concern, such as lack of access to medical treatments, increased communication barriers caused by wearing masks and having to choose between working to provide an income or self-isolation to prevent health complications associated with COVID-19 (Banerjee & Rai, 2020; Murayama et al., 2021; National Council on Disability, 2021). This is not to say that every person with a disability experienced these negative symptoms during the pandemic. However, individuals who experienced negative symptoms due to the pandemic may have been less likely to complete the survey, contributing to the low response rate. The pandemic also potentially impacted participant responses on the survey, especially the social connected construct, as previously discussed. Overall, the pandemic

potentially impacted the present study in several ways, from individuals' willingness to participate in the study to impacting participant responses to survey items.

The recruitment process, recruitment method, and external environmental factors all contributed to the low response rate which was the final major limitation of the study. A low response rate was not surprising, however, due to the precedent of previous literature that also had smaller sample sizes. As discussed in Chapter II the original desired sample size to achieve statistical power was 27 participants. The low response rate over the year that data collection occurred, however, required the researcher to adapt the study into a preliminary study. While the pilot study provides valuable initial information regarding individuals with physical disabilities who own service dogs independence in completing activities of daily living, social connectedness, employment, and quality of life, a larger study is still required to enhance the validity of the study, as well as produce results that can more reliably be generalized to the larger population of service dog owners with physical disabilities. The smaller sample size of the study diminished the power, and a larger sample size would have allowed the research to better evaluate the four constructs of the study.

## Implications for Future Research

Future studies exploring the holistic benefits of service dogs for individuals with disabilities could benefit from more in-depth examination of the secondary benefits of service dogs. The present study found similar findings as observed in previous literature in terms of increased employment and independence in completing activities of daily living, reinforcing what is already understood about the positive impacts service dogs have on their handlers' employment status and completion of activities of daily living. The findings regarding social connectedness and overall quality of life, however, contradicted findings of previous literature

that indicated that individuals who own service dogs have higher levels of social connectedness and perceived quality of life when compared to other who do not have service dogs. This finding could be due to a number of environmental and social factors present at the time of the study and future social and environmental changes could further impact individuals' with service dogs perceptions. Subsequent research could be designed to more fully examine social connectedness and quality of life to identify contributing factors that influence participants' perceptions.

Additionally, a new study with a larger sample size would allow for more generalizability of findings. A larger sample size would allow for more high-level statistical analyses of data (i.e., MANOVA, ANOVA, etc.), therefore providing a deeper understanding on the impacts service dogs have on their handlers lives. Additionally, a longitudinal study with a larger sample size would generate more clarity on the lasting secondary benefits of service dogs, while accounting for social and environmental changes throughout the life of the service dog. These alternative research designs could potentially improve researchers', service dog organizations', service dog owners', and funding agencies' understanding of the secondary benefits of service dogs, thus potentially increasing the availability and funding resources for service dogs.

Additionally, a study with a larger sample size exploring differences on study constructs between participants on a waiting list to receive a service dog and participants who already own a service dog is needed. Often, assessments are normed using samples that do not consist of individuals with disabilities, causing the assessments to be less reliable and valid when used with individuals with disabilities. Having a comparison of individuals on a waiting list to receive a service dog and participants would allow for a more accurate interpretation of results, as opposed to a comparison against the general public. This would also allow for more sophisticated analysis

of data, which would also potentially control for external social and environmental factors that impact participant responses, potentially producing more generalizable results.

A qualitative study that examines participants' personal experiences with holistic benefits of owning service dogs is also necessary in expanding the understanding of the secondary benefits of service dogs. This type of study is necessary in understanding the areas in which individuals with disabilities experience additional benefits of owning a service dog, aside from the primary task the service dog is trained to complete. Exploring participants' experiences would allow for a fuller understanding of holistic benefits, as opposed to a quantitative study that pre-identifies constructs to explore. The qualitative study would potentially allow for emergent and lesser examined benefits to be identified, as well as exploring the personal experiences of participants.

Additional studies exploring the benefits of service dogs for individuals with disabilities other than physical disabilities are still needed. Because the secondary benefits of service dogs may be exclusive to one disability population due to the unique barriers and challenges they face, additional research is needed to provide a deeper understanding of service dogs of individuals with diverse disabilities. These types of studies have the potential to identify emergent secondary benefits and provide researchers with an understanding of additional gaps in the literature that need to be explored to provide a holistic understanding of the full benefits of service dogs. Furthermore, future research can improve service providers' understanding of the benefits of service dogs as an intervention to holistically and positively impact their handlers' lives. This understanding can not only impact the services counselors provide, but also the evidence-based best practices counselor educators impart on novice counselors.

As for the implications on the fields of counseling and counseling education, the present study, as well as additional research, has the potential to shape the way counselors work with and understand clients, as well as how counselor educators prepare students for working with individuals with disabilities. First, the present study and future research on the topic has the potential to influence counselor educators' understanding of trends related to their clients' experiences related to the four study constructs when compared with the general public regardless of if their clients own service dogs. By comparing individuals with physical disabilities who own service dogs to the general public, counselor educators can glean a better understanding of the unique challenges their clients with physical disabilities face in terms of their independence in completing activities of daily living, social connectedness, employment and quality of life. Counselor educators can also use this information to better prepare students to work with clients who have physical disabilities by altering students to potential challenges their clients may face and assist students in identifying various best practices that can be employed to promote successful client outcomes.

Additionally, the current and future studies impact the fields of counseling and counseling education by making counselor educators and, in turn, their students aware of the unique benefits and challenges service dog handlers face in a variety of settings to promote the continued use of service dogs as a holistic intervention. By sharing the benefits of service dogs with students, counselor educators can encourage novice counselors to continue employing innovative interventions when working with clients, which promotes the development of new best-practices in the field. Not only do the benefits of service dogs need to be discussed, the challenges service dog handlers face need to be discussed with novice students to assist them in holistically understanding the impact a service dog has on their handler's life. Counselors,

counselor educators and counseling students can also utilize their understanding of the benefits and challenges of utilizing services dogs when not only working with clients, but also when working with key stakeholders, such as their clients' employers, family and educators. By being able to discuss the benefits of service dogs and ways in which challenges can be addressed, counselor educators and counselors can promote the use of service dogs for individuals with disabilities and reduce the stigma associated with the use of service dogs in various settings.

Finally, the present study and future research has the potential to impact the field of counseling by contributing to the understanding of best practices and assist in validating the use of service dogs as a holistic intervention for individuals with diverse disabilities. Future research has the potential to not only validate the use of service dogs as a best practice when working with individuals with disabilities, but also to provide counselors with an innovative model or framework from which counselors can operate from and better understand their clients. One of the goals of the counseling profession is to continue identifying evidence-based practices that can assist counselors in better serving their clients' ever-changing needs. Current and future research regarding the use of service dogs as a holistic intervention for individuals with disabilities has the potential to promote the growth and development of best practices in the field of counseling, as well as provide counselors and counselor educators with a better understanding of their clients and strategies to promote client success.

## Summary

The goal of the present study was to contribute to the limited existing literature regarding the holistic benefits of service dogs, specifically by examining the impact of service dogs on individuals with physical disabilities in terms of their independence in completing activities of daily living, social connectedness, employment, and overall quality of life. The current study

advanced the understanding of the holistic secondary benefits of service dogs as an intervention for individuals with physical disabilities and added to the existing literature on the topic. Results of the study found that participants experienced more independence in completing six activities of daily living, affirming the findings of previous literature.

In terms of social connectedness, participants reported higher levels of social isolation and lower levels of companionship and ability to participate in social activities. These findings indicate that overall, participants experienced lowered levels of social connectedness. This finding contradicts the results of previous literature, as preceding studies have found that owning a service dog has been linked to increased social connectedness for their handler. The results of the current study, however, may be reflective of the external social and environmental factors present at the time of the study (i.e., COVID-19).

Exploring the construct of employment participants, on average, were employed for longer periods of time when compared with the general public. Additionally, when examining employment satisfaction, participants; job satisfaction was reflective of the national average in that employed participants, on average, reported being satisfied with their employment. Finally, participants reported lower levels of quality of life when compared with other individuals with physical disabilities. Again, this finding contradicts the findings of previous literature, indicating a need for additional exploration into quality of life for individuals with physical disabilities who own service dogs to be conducted.

Investigating the relationship between each of the study constructs and length of service dogs ownership, only employment satisfaction and social isolation produced very strong, positive and moderate, negative, statistically significant correlations, respectively. Independence in completing activities of daily living, ability to participate in social activities, companionship

and quality of life all resulted in weak, positive, correlations when exploring the relationship between each construct and length of service dog ownership. Each of these correlations, however, were not statistically significant. The relationship between length of employment and length of service dog ownership produced a moderate, positive correlation, however, the correlation was not statistically significant. The small sample size may have impacted these correlations, as a larger sample size could have provided a more accurate and generalizable understanding of the relationships between each outcome and length of service dog ownership. Additionally, given the complex and multifaceted nature of each construct, confounding variable may be present and impacting the results of the correlational analyses making is more difficulty to effectively isolate the variables. Future research is needed to further explore the holistic impact of how owning a service dog impacts their handler's life throughout the duration of ownership.

While the present study did achieve its goal of contributing to the current literature regarding individuals with physical disabilities independence in completing activities of daily living, social connectedness, employment and quality of life, the present study contained limitations, indicating the need for additional research to be conducted. Limitations of the study include the study design and a lack of diversity in certain participant characteristics (i.e., gender, race/ethnicity, geographical location, length of time employed and service dog ownership), which impacted the generalizability of the study. Additionally, the recruitment process, recruitment methods and social and environmental factors all potentially impacted participation in the study, resulting in a small sample size, which was the major limitation of the present study. Additional studies with larger sample sizes and alternative designs are needed to continue adding

to existing literature and affirming the holistic benefits of service dogs for individuals with disabilities and shaping the counseling and counseling education professions.

## Chapter V. Manuscript

### Introduction

In the United States, there are currently over 500,000 individuals with disabilities who use service dogs, a number which is expected to continue to rise because of the numerous benefits service dogs provide to their handlers (Muramatsu et al., 2015; Trainer, 2016). A service dog is a canine that has been training to assist or complete a task for an individual with a diagnosed disability (ADA, 1990). The task that the service dog is trained to complete, such as pulling a wheelchair or retrieving items, is the primary benefit service dogs provide to their handlers (Crowe et al., 2014; Levey & Chappy, 2017; O'Haire & Rodriquez, 2018; Rintala et al., 2002). Research, however, has indicated that there are multiple secondary benefits service dogs also provide to their handlers (Allen & Blascovich, 1996; Camp, 2011; Carr et al., 2018; Hall et al., 2017; Lundqviat et al., 2019; McIver et al., 2020; Rintala et al., 2002).

Secondary benefits of service dogs include decreased negative psychological and physiological symptoms (Chandler, 2018; Fine, 2018; Hogawood et al., 2017; House et al., 2018; O'Haire, 2013; Parshall, 2003; Stapleton, 2016; Walsh, 2009), improved performance of activities of daily living (Crowe et al., 2014; Hall et al., 2017; Levey & Chappy, 2017; Rintala et al., 2002), increased rates of employment (Crowe et al., 2014; Thorne et al., 2017; Yount et al., 2013), greater social connectedness (Champagne et al., 2016; Crowe et al., 2014; Guest et al., 2006; Hicks & Weisman, 2015; McNicholas & Collis, 2000), and improved self-perceptions of quality of life (Camp, 2001; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002; Rodriquez et al., 2019). These secondary benefits to a person who uses a service dog have been attributed to the human-canine bond which allows service dogs to transcend their primary tasks and

holistically and positively impact their handlers' lives (Hicks & Weisman, 2015; Maharaj et al., 2016; Walsh, 2009).

Because of the growing number of services dogs and a deepening understanding of their primary benefits for individuals with disabilities, researchers have recently begun exploring the secondary benefits accrued to individuals with specific disabilities, such as autism spectrum disorder, diabetes, or epilepsy, in everyday environments when using a service dog (Hoagwood et al., 2017; O'Haire, 2013; Parenti et al., 2013). Exploring the secondary benefits of service dogs for specific populations has yielded valuable information, such as how service dogs decrease the need for assistance when completing activities of daily living for individuals with severe ambulatory disabilities (Allen & Blaschovick, 1996) or how service dogs increase quality of life and activity levels of individuals with hearing loss (Lundqvist et al., 2018). Limited research exists, however, that would enable those secondary benefits to be generalized to a broader group of individuals with diverse physical disabilities.

The term physical disability is an umbrella term that encapsulates a number of disabilities including multiple sclerosis, spina bifida, spinal cord injury, amputation, cerebral palsy, muscular dystrophy, hearing impairment, visual impairment, epilepsy, arthritis, dwarfism, and brain injury (Mackelprang & Salsgiver, 2016). All disabilities falling under the umbrella term of physical disability have the commonality of being conditions that cause limitations within the areas of physical functioning, mobility, activities of daily living, dexterity, and endurance when combined with contextual factors (Dunn & Brody, 2008; Mackelprang & Salsgiver, 2016; Malik & Anton, 2013). Although it can be assumed that if service dogs benefit other specific populations of individuals with disabilities, they will also benefit individuals with diverse

physical abilities. As stated previously, very limited research on the secondary benefits of service dogs for the population of individuals with diverse physical abilities has been conducted.

Additionally, literature exploring the benefits of service dogs for individuals with disabilities has tended to focus on a single, specific construct or benefit, such as social connectedness (Hicks & Weisman, 2015; Rodriquez et al., 2019), employment (Glenn, 2013; Rudastam et al., 2012), and quality of life (Hall et al., 2017; Lundqviat et al., 2018; McIver & Mills, 2020). This research has been valuable and provides the foundational understanding of the secondary benefits of service dogs. Literature providing a fuller view of the multiple secondary benefits of service dogs, however, is scarce, as the use of service dogs is a relatively new intervention for individuals with disabilities and additional research is needed.

The purpose of the current study was to empirically examine the holistic impact service dogs have on individuals with physical disabilities regarding the individuals' abilities to more independently perform activities of daily living, establish and maintain social connectedness, gain and maintain employment, and self-perceptions of their quality of life. By exploring these four constructs, which are critical to the independence and inclusiveness of people with disabilities, this study provided additional information to address the gap in the literature that exists regarding the reliability and validity of service dogs as an intervention and provided a more holistic understanding of the secondary benefits of service dogs. Additionally, participants in this study represented a diverse range of physical disabilities, which provided support for the use of service dogs for individuals in the context of the broader population.

## Literature Review

The Americans with Disabilities Act, or ADA, of 1990 defines a service animal as a canine that has been trained to assist or complete a task for an individual diagnosed with a

disability, where disability is defined as any condition that substantially limits one or more major life activity. Based on the ADA (1990) definition, a service dog is regarded as an assistive device, not a pet, and specifies that canines are the only species that are considered to be service animals and receive protections under the law. The ADA (1990) also established some qualifications to ensure that service dogs are used to assist individuals with disabilities in mitigating functional limitations caused by their condition. For example, the ADA (1990) denotes that violence protection, crime deterrence, well-being, or companionship are unacceptable tasks under the definition of a service animal, as these behaviors are innate to canines and could potentially cause harm to the community (ADA, 1990; Mills & Yeager, 2012). The ADA (1990) also specifies that emotional support or comfort, which are also innate characteristics of dogs, do not qualify as a trained task and therefore, service animals must provide more than emotional support.

**Human-Canine Bond**

While service dogs are trained to complete specific tasks for individuals with disabilities, the human-canine bond allows service dogs to transcend their primary benefit, thus providing numerous secondary benefits for their handlers. The human-canine bond is defined as the strong, universal emotional connection that humans share with dogs (Hicks & Weisman, 2015; Maharaj et al., 2018). Dogs innately provide humans with a sense of emotional support and comfort due to the human-canine bond (Chandler et al., 2010; Maharaja et al., 2016; Walsh, 2009). The connection humans feel towards dogs is universal, meaning that humans feel support and comfort with all dogs, regardless of their personal connection to a given dog, and this forms the basis for companionship between humans and dogs (Beetz et al., 2011; Campo & Uchino, 2013; Chandler, 2018; Fine, 2018; Hogawood et al., 2017; Marshall-Pescini et al., 2019; Nagasawa et

al., 2015; Odindaal, 2000; O'Haire, 2013). In an attempt to explain this phenomenon, scholars have cited the human-canine bond as the invisible force that connects humans and dogs, making interventions that incorporate canines so effective and a central tenant of a successful human-service dog partnership (Hicks & Weisman, 2015; Rodriquez et al., 2017; Walsh, 2009).

Physiologically, research indicates that the human-canine bond immediately causes an increase an individual's levels of oxytocin (Marshall-Pescini et al., 2019; Nagasawa et al., 2015) and dopamine (Odindaal, 2000), while decreasing blood pressure (Odendaal, 2000) and cortisol levels (Beetz et al., 2011; Menna et al.,2019). These physiological benefits of the human-canine bond are immediate and easily identified through medical assessments, such as stress exams and cardiograms (House et al., 2018; Maharaj et al., 2018; Nagasawa et al., 2015; Odendaal, 2000). In addition to physiological benefits, several studies also demonstrate that the human-canine bond provides humans with psychological benefits (Chandler, 2018; Fine, 2018; Hogawood et al., 2017; House et al., 2018; O'Haire, 2013; Parshall, 2003; Stapleton, 2016; Walsh, 2009). The psychological benefits of the human-canine bond, however, are less easy to assess through the use of formal assessments and continue to be examined (Beetz et al., 2011; House et al., 2018; Parshall, 2003). There are a number of research studies that substantiate a variety of psychological benefits of the human-canine bond through outcomes, such as reducing depression (Chandler et al., 2010; House et al., 2018; O'Callaghan & Chandler, 2011; O'Haire & Rodriguez, 2018), anxiety (Chandler, 2018; Chandler et al., 2010; O'Callaghan & Chandler, 2011; O'Haire & Rodriguez, 2018; Owenby, 2017), stress levels (Chandler, 2018; House et al., 2018; Odendaal, 2000; Owenby, 2017), problematic behaviors (O'Callaghan & Chandler, 2011; O'Haire, 2013; Owenby, 2017; Stapleton, 2017), aggressiveness (O'Haire, 2013; Walsh, 2009),

hyperactivity (O'Haire, 2013; Parshall, 2003) and distractibility (O'Haire, 2013; Parshall, 2003) in clients of various ages and presenting conditions.

The human-canine bond is a central tenant of a successful relationship between an individual and their service dog (Hicks & Weisman, 2015; Rodriquez et al., 2017; Walsh, 2009). While service dogs' primary jobs are to perform unique tasks for individuals with disabilities, the human-canine bond also affords service dog users secondary benefits (O'Haire & Rodriquez, 2018). The connection developed between a service dog and their owner is proven to increase engagement in activities of daily living (Allen & Blascovich, 1996; Lane et al., 1998; Lundqvist et al., 2019; Rintala et al., 2008; Winkle et al., 2011), social connectedness (Carr et al., 2018; Lundqvist et al., 2018; Rintala et al., 2008; Sanders, 2000; Yount et al., 2013), occupational achievement (Groomes et al., 2014; Hall et al., 2017; Thorne et al., 2017), and quality of life (Camp, 2001; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002; Rodriquez et al., 2019).

**Activities of Daily Living**

The term activities of daily living describe the six essential tasks individuals engage in everyday to maintain toileting, feeding, dressing, grooming, ambulation, and bathing (Hicks & Weisman, 2015). Many individuals with disabilities report difficulty in completing activities of daily living without assistance, whether the assistance is paid or unpaid (Allen & Blascovich, 1996; Lundqvist et al., 2019; Rodriquez et al., 2019). Service dogs are often trained to assist individuals with disabilities in completing activities of daily living, such as assisting during wheelchair transfers or retrieving clothes for their handler (Crowe et al., 2014; Levey & Chappy, 2017; Rintala et al., 2008). By making activities of daily living easier for individuals to complete, the assistance of service dogs leads to individuals' increased sense of self-efficacy,

self-esteem, and independence, as well as decreased reliance on others to complete daily activities (Hall et al., 2017; Lane et al., 1998; Rintala et al., 2008).

As individuals with service dogs increase their independence in completing activities of daily living, they also reduce their need for paid assistance, which, in turn, increases the economic benefits of having a service dog through the money saved (Allen & Blascovich, 1996; Lundqvist et al., 2019). Similarly, individuals with disabilities are often forced to rely on family members for assistance, which can place stress on familial relationships (Lundqvist et al., 2019; Thorne et al., 2017; Rodriquez et al., 2019). The increased levels of independence in completing activities of daily living promoted by using a service dog can improve family dynamics by reducing the need for assistance in everyday activities (Lane et al., 1998; Rintala et al., 2008; Winkle et al., 2011). There is not much additional research regarding the impact of service dogs on individuals with disabilities' independent completion of activities of daily living, therefore, additional research to provide empirical evidence that explores this construct is needed.

**Social Connectedness**

While service dogs may be trained to primarily assist their owner in completing activities of daily living, they also engender secondary benefits that can have positive impacts in a variety of life settings, such as community, social, and occupational environments (Carr et al., 2018; Crowe et al., 2014; Hall et al., 2017; Lane et al., 1998; Rintala et al., 2008; Winkle et al., 2011). Individuals with disabilities often experience challenges to participating in social and community events because of the physical demands and lack of accessibility in the community (Champagne et al., 2016). These challenges can result in decreased social connectedness (Champagne et al., 2016). Social connection is the sense of being close with others, which leads to physical of being valued and cared for, and actively engaging in relationships with others (Dunn & Brody, 2008).

Because of the primary benefits of service dogs and increased perceptions of self-efficacy and independence, individuals who employ service dogs are more likely to be engaged within their communities (Carr et al., 2018; Champagne et al., 2016; Crowe et al., 2014; Guest et al., 2006; Hicks & Weisman, 2015; McNicholas & Collis, 2000).

While participating in community and leisure activities, people with service dogs are more likely to be approached, have positive social interactions, and successfully adapt to changes in social settings than individuals with disabilities that do not have a service dog (Carr et al., 2018; Guest et al., 2006; Lundqvist et al., 2018; Rintala et al., 2002; Sanders, 2000; Yount et al., 2013). Several studies found that when their service dog is present, individuals with disabilities report experiencing less social avoidance when engaging in their communities (Guest et al., 2006; Hall et al., 2017; McNicholas & Collis, 2000). The research regarding the social impact of service dogs, is limited to a few studies and more research is needed to empirically validate the effectiveness of service dogs in improving their handlers' social connectedness.

**Employment**

Individuals with disabilities often face barriers within the area of employment, such as negative attitudes of employers and a lack of accessibility in the workplace (Glenn, 2013; Nevala et al., 2015). According to the United States Department of Labor (2018), individuals with disabilities are less than half as likely to be employed than those without disabilities. The gap in employment rates may increase financial concerns for individuals with disabilities, which is compounded by the high costs of resources to address functional limitations, such as medical treatment or assistive devices (Barker et al., 2012; Rudstam et al., 2012; Thorne et al., 2017). While many interventions have been successfully implemented to improve employment outcomes for individuals with disabilities, service dogs have recently been found to increase

employment rates for their owners when compared with people that do not use a service dog (Groomes et al., 2014; Hall et al., 2017).

In addition to the increased psychosocial and economic security for employed individuals with disabilities, using a service dog has also been associated with improved health and physical activity, resulting in reduced workplace absenteeism due to health-related issues (Refson et al., 1999; Thorne et al., 2017). Using a service dog in the workplace can also increase the individual's sense of safety and relaxation, resulting in decreased stress levels, which leads to more positive interactions with coworkers and an overall more positive work environment (Crowe et al., 2014; Thorne et al., 2017; Yount et al., 2013). Just by having a service dog in the workplace, all employees can experience the benefits of the human-canine bond and senses of community and belongingness can be fostered (Glenn, 2013; Thorne et al., 2017). Like the other secondary benefits discussed previously, there are only a handful of studies that examine the impact service dogs have on their handlers' employment and additional research is needed.

**Quality of Life**

The secondary benefits of a service dog positively impact almost every aspect of a person's life resulting in the increased perception of their quality of their life (Camp, 2001; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002; Rodriquez et al., 2019). Quality of life can be defined as the unique experiences each person has regarding health, comfort, level of satisfaction in life, and perception about needs being met (Groomes et al., 2014; Hall et al., 2017). Many components contribute to an individual's perception of their quality of life, such as mental and physical health, level of independence, social connection, involvement in leisure activities, and occupational achievement (Hall et al., 2017; McIver et al., 2020). For individuals with disabilities, the disability itself may not directly lower their perception of the quality of their

lives (Carr et al., 2018; McIver et al., 2020). Rather, lowered self-efficacy, physical of dependence, and perceptions of the lack of achievement may negatively impact an individual's overall discernment of their quality of life (Carr et al., 2018; McIver et al., 2020).

Service dogs, however, have been found to increase independence in activities of daily living, social connectedness, and occupational achievement, thus also improving their handlers' overall quality of life (Camp, 2001; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002; Rodriquez et al., 2019). Moreover, service dogs provide their owners with a variety of secondary benefits that improve mental, I, social, and occupational functioning that can lead to improved overall quality of life (Camp, 2001; Carr et al., 2018; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002). While some research exists regarding the impact service dogs have on their handlers' quality of life, this research is scarce, and the limitations of these studies indicate the need for additional research to further validate the use of service dogs as a holistic intervention for individuals with disabilities.

**Physical Disabilities**

For individuals with physical disabilities, service dogs can serve as a holistic intervention to address many of the barriers they face in their everyday lives (Canine Companions for Independence, 2020; Paws with a Cause, 2020). The tasks service dogs perform for individuals with disabilities are diverse, making service dogs an individualized intervention for individuals with physical disabilities. They include opening and closing doors, cabinets, drawers, etc., retrieving items, pulling a wheelchair, alerting a caretaker of medical emergencies, alerting a to changes in blood sugar levels, reducing the duration of seizures, assisting with transfers, assisting with making the bed, counterbalancing, assisting with orientation and mobility, alerting to noises in the environment, along with many others (Canine Companions for Independence, 2020; Paws

with a Cause, 2020). Because dogs can be trained to perform tasks that meet a wide range of needs, many disability populations could potentially benefit from the use of service dogs. Research regarding the benefits of service dogs has largely been done to support their use for specific populations, such as individuals with autism spectrum disorder (O'Haire, 2013), individuals with hearing impairments (Guest et al., 2006; Hall et al., 2017; Lundqvist et al., 2018), and individuals with posttraumatic stress disorder (LaFollette et al., 2019; Thorne et al., 2017; Yount et al., 2013). Very little research exists regarding the benefits of service dogs for individuals with physical disabilities, however, highlighting the need to further validate the use of service dogs as a holistic intervention for individuals with a wider range of physical disabilities (Hall et al, 2017; Rodriquez et al., 2019; Winkle et al., 2011).

A physical disability is a condition that causes functional limitations for an individual's physical functioning, mobility, activities of daily living, dexterity, and/or endurance when combined with contextual factors, such as negative societal attitudes and inaccessibility (Dunn & Brody, 2008). physical disabilities fall into one of two categories: a) congenital, which occurs when a person is born with a physical disability; or b) acquired, which occurs when a person is diagnosed with a physical disability following a physically traumatic event, infection, or disease (Mackelprang & Salsgiver, 2016; Malik & Anton, 2013). Examples of physical disabilities include but are not limited to multiple sclerosis, spina bifida, spinal cord injuries, amputation, cerebral palsy, muscular dystrophy, hearing impairment, visual impairment, epilepsy, arthritis, and brain injury (Mackelprang & Salsgiver, 2016).

While the causes of physical disabilities are varied, acquiring a physical disability is considered a life stressor and a major life adjustment, due to the number of systemic barriers and oppression individuals with physical disabilities face in their daily life (Chow et al., 2005;

Dorstyn et al., 2011; Lumsdaine & Thurston, 2017; Nevala et al., 2015 Ochoa-Morales et al., 2019; Repke & Ipsen, 2019). Because physical disabilities can be acquired at any point in a person's life, research indicates that acquiring a disability is associated with a decreased sense of independence, especially in the completion of activities of daily living (Branch & Van Swearingen, 2002). Additionally, the barriers that individuals with physical disabilities face, such as a lack of transportation options, inaccessible spaces, or negative perceptions of others, are linked to lower levels of employment rates, especially when compared to the employment rates of their peers without disabilities (Chow et al., 2005; de Almeida et al., 2019; Grise et al., 2019; Lorefice et al., 2018; Nevala et al., 2015; Repke & Ipsen, 2019; Sevack et al., 2015).

Within the workplace, many individuals with physical disabilities require reasonable accommodations to complete essential job functions (Lorefice et al., 2018; Nevala et al., 2015). As outlined by the ADA (1990), employers are required to provide qualified employees or prospective employees with assistance or adaptations to a workspace or function, unless the accommodation creates undo hardships for the employer. For individuals with physical disabilities, work accommodations are most successful when the employer is positive, supportive, and has open communication, as well as when the costs of the accommodation are minimal to the employer (Nevala et al., 2015).

The barriers individuals with physical disabilities face in the workplace are also seen within the construct of social connectedness, such as inaccessibility in the community and negative attitudes of peers. Individuals with physical disabilities report higher levels of social isolation and negative psychosocial symptoms, such as depression and anxiety (de la Vega et al., 2019; Lumsdaine & Thurston, 2017; Office of National Statistics, 2015; Shapiro & Martin, 2014; WHO, 2020). Because social connectedness impacts an individual's mental wellbeing, additional

interventions are needed to address the barriers individuals with physical disabilities face in the community to increase their engagement in social activities and social supports.

For individuals with physical disabilities, social connectedness, which includes relationships with others, engagement in social activities, and the perception belonginess and maintaining employment are positively correlated with overall perception of their quality of life (de la Vega et al., 2019; Kim et al., 2014; Ochoa-Morales et al., 2019). Individuals with physical disabilities, however, report a lower quality of life, often due to the isolation and other barriers they face, indicating there is an interconnection between employment status, social connectedness, and perceived quality of life (Lumsdaine & Thurston, 2017; Ochoa-Morales et al., 2019). Because quality of life is determined by one's perception of other facets of their life, holistic interventions are needed to address the multifaceted aspects of quality of life and address the barriers individuals with physical disabilities face.

## Significance of the Study

One intervention to holistically improve outcomes for individuals with physical disabilities is the use of service dogs. Service dogs are a unique intervention for people with physical disabilities, as other interventions often target only one aspect of an individual's life, such as vocational rehabilitation counseling or independent living skills training. Service dogs have the potential to impact multiple facets of handlers' lives. Research demonstrates that individuals with physical disabilities who owned service dogs rated their overall quality of life, life satisfaction, positive mental health symptoms, self-esteem, social connection, and workplace engagement higher than those who did not own service dogs (Rintala et al., 2002; Rodriquez et al., 2019; Winkle et al., 2011).

While some research exists supporting the positive impact of service dogs for people with physical disabilities, there are only a handful of empirical studies that elucidate the impact of service dogs on activities of daily living, employment, social connectedness, and quality of life for individuals with physical disabilities (Rintala et al., 2002; Rodriquez & O'Haire, 2019; Winkle et al., 2011). Individuals with physical disabilities face a unique set of challenges, such as experiences of loss in multiple facets of life, and reduced social connections (Dunn & Brody, 2008). The secondary benefits of service dogs potentially alleviate the psychosocial challenges people with physical disabilities face, therefore, research regarding the intricacies of benefits of service dogs should be conducted (Chandler et al., 2010; Turner, 2005; Walsh, 2009). The limited literature regarding the benefits of service dogs indicates the need for research to be conducted to further explore the holistic impact service dogs have on their handlers' lives (Hall et al., 2017; Rodriquez et al., 2019; Winkle et al., 2011). Additionally, a majority of the existing research has limitations of small sample sizes and lack of diversity in participant demographics, indicating a need for additional research to be conducted to further validate the use of service dogs as a holistic intervention for individuals with physical disabilities. The aim of the current study was to explore the impacts service dogs have on individuals with diverse physical disabilities on their activities of daily living, social connection, employment, and quality of life.

## Methodology

A cross-sectional survey research design for quantitative research was used to examine the impact of owning a service dog on the activities of daily living, social connectedness, employment, and quality of life for individuals with physical disabilities. Data collection occurred using an online survey that was published on Qualtrics, which is designed to securely

store collected data. The survey was distributed to 113 organizations across the United States that train and place service dogs with individuals with physical disabilities.

**Research Questions**

To further examine the four study constructs, the following research questions were empirically addressed using a cross-sectional survey research design:

9. How does people with physical disabilities who own service dogs compare with the general public regarding their independence in completing activities of daily living?
10. Does more time owning a service dog increase people with physical disabilities independence in completing actives of daily living?
11. How does people with physical disabilities who own service dogs compare with the general public regarding their social connectedness?
12. Does more time owning a service dog increase people with physical disabilities social connectedness?
13. How does people with physical disabilities who own service dogs compare with the general public regarding their length of employment and employment satisfaction?
14. Does more time owning a service dog increase people with physical disabilities length of employment and employment satisfaction?
15. How does people with physical disabilities who own service dogs compare with the general public regarding their quality of life?
16. Does more time owning a service dog increase people with physical disabilities quality of life?

## Participants Characteristics

Individuals were eligible to participate in the study if they (a) were at least 19 years old, (b) were able to read English, (c) had internet access, (d) had been diagnosed with a physical disability, and physical owned a service dog or were on a waiting list to receive a service dog. Based on the definitions of a physical disability, examples of physical disabilities, for the purpose of this study, included arthritis, brain injury, cerebral palsy, dwarfism, epilepsy, hearing impairment, multiple sclerosis, muscular dystrophy, spina bifida, spinal cord injury, visual impairment, and other physical disabilities, as determined by the researcher. Eligible participants assisted in answering the previously stated research questions by providing quantitative information regarding the four constructs of the current study.

## Data Collection and Procedures

All data collection activities and recruitment for this study were approved by the Auburn University Institutional Review Board, or IRB. Data collection occurred using an online survey that was published on Qualtrics, which is designed to securely store collected data. The survey was distributed to 113 predetermined organizations across the United States that train and place service dogs with individuals with physical disabilities. The nationwide scope of survey distribution increased the probability of more diverse participant demographics (e.g., location, ethnicity, race, physical disability, etc.) and allowed for greater generalizability of the findings. Participants had the option to enter into a raffle for their contribution to the study in an effort to promote recruitment and incentivize study participation (Singer & Couper, 2009; Zutlevics, 2016). Due to the low response rate, however, four rounds of recruitment occurred between February 2021 and January 2022, with three rounds of recruitment emails sent to service dog organizations and one round of the researcher calling 12 randomly selected organizations from

across the nation. Recruitment efforts resulted in a total of 24 organizations agreeing to distribute the study to their constituents.

Upon receiving a completed site authorization letter, a participant recruitment flyer and email were sent to organizations to disseminate to their constituents which provided them with access to the electronic survey. Participants who consented to participate in the study then completed the online survey consisting of the demographic questionnaire, the physical Self-maintenance Scale, or PSMS-Self, the PROMIS Ability to Participate in Social Activities adult short form, the PROMIS Social Isolation adult short form, the PROMIS Companionship adult short form, and the 16-item Flanagan Quality of Life Scale, or QOLS. It was estimated the survey would take a total of 20-30 minutes to complete all of the measures in the study. Masking did not occur, as participants completed all aspects of the electronic survey.

Once the data collection process was completed, the researcher screened and cleaned the data to identify and exclude data sets that were incomplete, as well as ensure all participants had physical disabilities, according to the definition provided previously in this study. A total of 16 responses were received, and no data sets were excluded due to being incomplete. Data analysis in this study, due to one participant indicating that their primary disability was one that was more appropriately classified as a neurological disorder and their secondary disability could also not be considered a physical disability per the definition utilized in this study. When screening the data based on disability, the researcher excluded one data set because the participant indicated their primary disability was one that was more appropriately classified as a neurological disorder. Similarly, this participant disclosed a secondary disability, which could also not be considered a physical disability per the definition utilized in this study. The screening and cleaning of the data resulted in 15 complete data sets being included for the purpose of data analysis in this study.

## Measures

After consenting to participate in the study, participants completed a demographic questionnaire. Demographic information collected from all participants included age, gender, ethnicity, race, geographic location, highest level of education completed, relationship status, disability status, employment status and if employed, satisfaction with employment, and length of time at place of employment. Participants were also asked if they currently owned a service dog and if so, for how long. Finally, participants were asked the amount of time they had been on a waiting list to receive a service dog.

Participants also completed various instruments that assessed the variables examined in this study. The PSMS (Lawton & Brody, 1969), the 16-item Flanagan QOLS (Flanagan, 1982), and three PROMIS, assessments, the PROMIS Ability to Participate in Social Activities adult short form (Cella et al., 2010), the PROMIS Social Isolation adult short form (Cella et al., 2010), and the PROMIS Companionship adult short form (Cella et al., 2010) were administered to participants via Qualtrics. Each of the measures utilized in the study and their psychometric information were accessible online at no cost. The data collected with these measures was used to provide descriptive information about participants and was analyzed to explore the effects of service dog ownership on the variables of activities of daily living, social connectedness employment, and quality of life for individuals with physical disabilities.

## Data Analysis

Data analysis was performed in three phases. First, descriptive statistics were analyzed for all categorical variables collected on the demographic questionnaire (e.g., age, gender, ethnicity, race, highest level of education, relationship status, employment status, and length of time employed). In the second phase, seven one-tailed, one-sample t-tests were conducted to

evaluate statistical differences amongst the sample data and the general population on outcome measures (i.e., activities of daily living, social connectedness, and quality of life), as well as for employment satisfaction and length of employment information collected in the demographic questionnaire. A one-tailed, one-sample t-test was utilized given the small sample size and allowed for inferences to be made between the population mean on each instrument. Additionally, because the hypotheses for the study examine significance in one direction for all four constructs, one-tailed tests were most appropriate for the study. In the third phase of data analysis, seven correlation analyses were conducted to evaluate the statistical relationship between the amount of time that participants owned their service dogs and each outcome measure. A correlation analysis is utilized to measure the extent of a relationship between two continuous variables by assisting researchers in predicting if there is a relationship between the two variables assessed (Asamoah, 2014; Janse et al., 2021; Schober et al., 2018). These analytic strategies assisted in examining each of the studies hypothesis and answering the overarching research questions that drive the present study.

## Results

To analyze data obtained through the electronic survey, descriptive statistics and seven one-tailed, one-sample t-tests were utilized. The descriptive statistics presented provide readers with a holistic understanding of participant characteristics. The one-tailed, one-sample t-tests allowed the researcher to examine differences in service dog owners' independence in completing actives of daily life, employment, social connectedness, and quality of life when compared to population means. For all t-test conducted in the present study, a significance level of $\alpha=.05$ was utilized. The results of the statistical analyses are presented below.

**Demographic Information**

A total of 16 individuals consented to participate in the survey. As discussed previously, one data set was excluded due to the participant reporting having primary and secondary disabilities that do not meet the inclusion criteria, per the definition of physical disability utilized for the purposes of the current study. The exclusion of this data set resulted in a total of 15 participant responses being used for data analysis. Table 1 presents the overall demographic characteristics of participants.

When examining the age of participants, ages ranged from 19-29 to 80-89 years old. Three individuals (20%) reporting being between the ages of 19 and 29, three (20%) reported being between the ages of 30 and 39, one participant (6.7%) reported being between the ages of 40 and 49, three (20%) reported being between the ages of 50 and 59, four (26.7%) reported being between the ages of 60 and 69, and one individual reported being between the ages of 80 and 89 (6.7%). There were no participants between the ages of 70 and 79 or over the age of 90. In terms of gender identification, 13 participants (96.7%) identified as female and only two individuals (13.3%) identified as male. No participants reported identifying as transgender or other. As for race/ethnicity, 14 participants (93.3%) identified as Caucasian/White and one participant (6.7%) identified as African American/Black. No other races/ethnicities were represented in the study.

In terms of the participants' highest level of education completed, three individuals (20%) reported obtaining a high school diploma, one (6.7%) reported attending some college but not earning a degree, one participant (6.7%) reported earning an associate's degree, five (33.3%) reported obtaining a bachelor's degree, two individuals (13.3.%) reported earning a master's degree, two (13.3%) reporting obtaining a professional degree beyond their bachelor's degree,

and one participant (6.7%) reported earning a doctorate. As for the marital status of participants, seven participants (46.7%) reported being single and never married, seven participants (46.7%) reported being currently married, and one individual (6.7%) reported being widowed. None of the participants reported being divorced or separated at the time of the study. Geographically, one participant (6.7%) reported living in the Northeast, 10 individuals (66.7%) lived in the I, and four participants (26.7%) lived in the West. There were no study participants who reported living in the South at the time of the study.

When examining the primary disability reported by participants, one individual (6.7%) reported having epilepsy, two (13.3%) reported having a spinal cord injury, and the remaining 12 participants (80%) reported having a primary disability that was not listed. For participants who reported have a primary disability that was not listed, participants were provided a section to write in their primary disability. Other disabilities identified included Tourette syndrome, spastic paraparesis, Ehlers-Danlos syndrome, ataxia, cancer, diabetes, schwannomatosis or spinal cord tumors, post-polio, Charcot Marie Tooth, and two participants (13.3%) reported having Myasthenia Gravis. Participants were also asked if they had a secondary disability. Nine participants (60%) reported having at least one secondary disability. Specifically, one participant reported having attention deficit/hyperactivity disorder, depression, anxiety, and spasticity. Another participant reported their secondary disabilities included diabetes and chronic pain due to falls related to their primary disability. One participant reported being deaf and also having chronic migraines, while another participant reported migraines and posttraumatic stress disorder. Severe allergies and posttraumatic stress disorder were reported by another individual. Finally, one participant reported spastic paraparesis, one reported having a traumatic brain injury, and one individual reported having a prosthetic leg.

All participants (n=15, 100%) in the study owned a service dog. As for length of time participants have owned their service dogs, ownership ranged from six months to over seven years. One individual (6.7%) owned their dog for less than six months, four participants (26.7%) owned their dogs for six months to a year, two (13.3%) owned their dogs for one to two years, two participants (13.3%) owned their dogs for two to three years, two individuals (13.3%) owned their dogs for five to six years, one (6.7%) owned their dog for six to seven years, and three participants (20%) owned their dogs for over seven years. Additionally, five participants (33.3%) previously owned another service dog, while 11 participants (73.3%) have never owned a service dog prior to receiving their current dog. Participants confirmed they currently owned a service dog when asked if they were currently on a waiting list to receive a service dog, as no participants indicated they were currently on a waiting list. When asked about current length of time on a waiting list to receive a service dog, however, 12 participants (92.3%) indicated the question was not applicable as they were not on a waiting list, one individual (6.7%) reported being on a waiting list for one to two years and two participants did not respond to the question.

**Activities of Daily Living**

To examine independence in completing activities of daily living for individuals with physical disabilities who use service dogs, participants were asked to complete the PSMS-Self, scale as part of the electronic survey utilized in the present study. Each item on the PSMS-Self asks respondents to rate their independence levels on statements regarding activities of daily living. Item responses consisted of three response ranges from total independence to complete dependence (i.e., with no help, with some help, with total help). Scores from each item were totaled to provide a level of independence in completing six activities of daily living. Activities of daily living assessed included eating, dressing, caring for oneself, ambulating around the

home environment, transferring in and out of bed, and bathing. When scoring the assessment, responses indicating total independence receive scores of one. Responses marked as some independence or total dependence receive scores of zero. Scores on this instrument, therefore, can range from six, indicating total independence, to zero, indicating total dependence.

Participant scores on the PSMS-Self ranged from two to six, with an average score of 4.8 (M=4.8, sd=1.373). All response on each item indicated total independence or some dependence and there were no responses on this scale that indicated total dependence across any of the items. Table 2 provides each question on the PSMS-Self, along with a visual representation of participant responses on each item.

A one-tailed, one-sample t-test was conducted to evaluate if individuals with physical disabilities who owned service dogs were more independent in completing activities of daily living when compared with the population mean for the PSMS-Self. For the purpose of this study, the population mean was reported as four, as indicated by Hokoishi and colleagues (2001). There was a significant difference in the independence levels in completing activities of daily living for individuals with physical disabilities who own service dogs (M=4.8, sd=1.373) when compared with the population mean for the instrument (M=4) conditions; t(15)=2.256, p=0.02. The 95 percent confidence interval for the mean difference between the two means was 4.04 and 5.56. Results indicate that there was a significant difference between the levels of independence in completing activities of daily living for participants with physical disabilities who own service dogs when compared with the population mean for the instrument. Based on the results, the null hypothesis for research question one was rejected, and the alternative hypothesis was accepted.

To examine research question two, a correlational analysis was conducted. This correlational analysis explored the relationship between the time participants owned their service

dogs and their independence in completing activities of daily living, as measured by the Physical Self-maintenance Scale Self-report. There was a positive correlation between participants' independence in completing activities of daily living and their length of service dog ownership, with $r(13)=.26$, $p=.349$. The coefficient of determination was $R^2=.068$. Results of this analysis indicate that there was a weak, positive correlation between participants' independence in completing activities of daily living and their length of service dog ownership. Based on the results, there was not a significant relationship between length of service dog ownership and independence in completing activities of daily living and the null hypothesis for research question two was accepted.

**Social Connectedness**

To examine social connectedness, three PROMIS assessments were utilized; the PROMIS Ability to Participate in Social Activities adult short form, the PROMIS Social Isolation adult short form, and the PROMIS Companionship adult short form. All three PROMIS instruments utilize a five-point Likert-scale response scale, ranging from Never to Always. In terms of scoring, each item on all three PROMIS assessments receives a score ranging from one to five. On the PROMIS Social Isolation short form and PROMIS Companionship short form, items rated as Never on the Likert-scale receive a score of one and items rated as Always receive a score of five, whereas on the PROMIS Ability to Participate in Social Activities short form, items rated as Never receive a score of five and items rated as Always receive a score of one. For all three PROMIS assessment, item responses are scored and scores for each item are added together to provide a raw score. Raw scores were converted to standard scores using the test manual. Raw scores for the PROMIS Ability to Participate in Social Activities short form and the PROMIS Social Isolation short form range from eight to 40 and standard scores range from

25.9 to 65.4 and 33.9 to 76.9, respectively. For the PROMIS Companionship short form, raw scores range from six to 30 and scaled scores range from 24.2 to 64.2.

A one-tailed, one-sample t-test was conducted to evaluate if ability to participate in social activities was greater for individuals with physical disabilities who owned service dogs when compared with the population mean for the PROMIS Ability to Participate in Social Activities. For the purpose of this study, the population mean utilized was M=50, as reported in the instrument test manual (PROMIS, 2018). There was a significant difference in the participants' ability to participate in social activities (M=42.213, sd=7.556) when compared with population mean for the instrument (M=50, SD=10) conditions; t(15)=-3.991, p=0.001. The 95 percent confidence interval for the mean difference between the two mean was 38.028 and 46.398. Results indicate that there was a significant difference between the ability to participate in social activities for participants with physical disabilities who own service dogs when compared with the population mean for the instrument. This finding, however, indicates that participants had less opportunity to participate in social activities than the general population on which the instrument was normed.

To evaluate if social isolation was greater for the general public when compared to individuals with physical disabilities who owned service dogs, a one-tailed, one-sample t-test was conducted. For the purpose of this study, the population mean utilized was M=50, as reported in the instrument test manual (PROMIS, 2021). There was a significant difference in the participants' social isolation (M=54.667, sd=8.995) when compared with population mean for the instrument (M=50, SD=10) conditions; t(15)=-2.009, p=0.032. The 95 percent confidence interval for the mean difference between the two mean was 49.686 and 59.648. Results indicate

that there was a significant difference between the social isolation for participants with physical disabilities who own service dogs when compared with the population mean for the instrument.

A one-tailed, one-sample t-test was conducted to evaluate if companionship was greater for individuals with physical disabilities who owned service dogs when compared with the population mean for the PROMIS Companionship short form. For the purpose of this study, the population mean utilized was M=50, as reported in the instrument test manual (PROMIS, 2022). There was not a significant difference in the participants' companionship scores (M=47.173, SD=8.698) when compared with population mean for the instrument (M=50, sd=10) conditions; t(15)=-1.259, p=0.114. The 95 percent confidence interval for the mean difference between the two means was 42.356 and 51.99. Results indicate that there was not a significant difference between the companionship levels of participants with physical disabilities who own service dogs when compared with the population mean for the instrument. Overall, since two out of the three instruments resulted in significant results, the null hypothesis for the social connectedness construct was rejected for research question 3.

To examine research question four, a correlational analysis was conducted for each of the three PROMIS assessments utilized to explore participants' social connectedness. This correlational analysis explored the relationship between the time participants owned their service dogs and social connectedness, as measured by the PROMIS Ability to Participate in Social Activities adult short form, the PROMIS Social Isolation adult short form and the PROMIS Companionship adult short form. For the PROMIS Ability to Participate in Social Activities assessment, there was a positive correlation between participants' ability to participate in social activities and their length of service dog ownership, with r(13)=.208, p=.456. The coefficient of determination was $R^2$=.043. Results of this analysis indicate that there was a weak, positive

correlation between participants' ability to participate in social activities and their length of service dog ownership. These results, however, were not statistically significant and there was not a statistically significant relationship between the two outcomes.

For the PROMIS Social Isolation assessment, there was a negative correlation between social isolation and length of service dog ownership, with $r(13)=.553$, $p=.033$. The coefficient of determination was $R^2=.305$. Results of this analysis indicate that there was a moderate, negative correlation between participants' social isolation and their length of service dog ownership, with individuals who owned service dogs for longer periods of time, experiencing less social isolation. These results indicate that the correlation was statistically significant and there was a statistically significant relationship between the outcomes.

For the PROMIS Companionship assessment, there was a positive correlation between companionship and length of service dog ownership, with $r(13)=.179$, $p=.523$. The coefficient of determination was $R^2=.032$. Results of this analysis indicate that there was a weak, positive correlation between participants' companionship and their length of service dog ownership. These results, however, were not statistically significant and there was not a statistically significant relationship between the two outcomes. Overall, since two out of the three correlation analyses indicated there was not a significant relationship between outcomes, the null hypothesis for the social connectedness construct was accepted.

**Employment**

When asked about their current employment on the demographic questionnaire, one participant (6.7%) reported being employed part-time, two individuals (13.3%) reported being employed full-time, two (13.3%) reported being self-employed, two participants (13.3%) reported being students, four (26.7%) reported being retired, and four individuals (26.7%)

reported being unable to work. No participants were employed by the military, unemployed, or unemployed due to reasons related to COVID-19. For the purposes of examining employment satisfaction and length of time employed, a sample of five (n=5) was utilized as there were five participants currently employed part-time, full-time, or self-employed. These five individuals were the only participants for the larger sample who completed the questions regarding length of time employed and employment satisfaction on the demographic questionnaire.

Of the five participants who were currently working, four individuals (80%) had been employed by their current employer for four to five years and one participant (20%) has been employed with the same employer for over 10 years (20%). A one-tailed, one-sample t-test was conducted to evaluate if length of time employed was longer for individuals with physical disabilities who owned service dogs when compared with the general public. For the purpose of this study, the average length of employment for the general population, reported by the Bureau of Labor Statistics (2020), was M=4.1 years. There was not a significant difference in the length of employment for individuals with physical disabilities who own service dogs (M=5.6, sd=2.46) when compared with the general population (M=4.1) conditions; $t(5)=1.363$, $p=0.122$. The 95 percent confidence interval for the mean difference between the two mean lengths of employment was 2.546 and 8.654. Results indicate that individuals with physical disabilities had longer lengths of employment than the general public. This difference in length of employment, however, was not significant overall and the null hypotheses was accepted.

To explore employment satisfaction, employed participants were asked to rate their level of job satisfaction on a five-point Likert scale, ranging from Very Dissatisfied to Very Satisfied. Two participants (40%) rated their employment satisfaction as Neutral, one (20%) rated it as Satisfied, and two individuals (60%) reported their employment satisfaction as Very Satisfied. A

one-tailed, one-sample t-test was conducted to examine the difference between the sample's job satisfaction and job satisfaction of employed individuals in the United States. For the purpose of this study, Satisfied was utilized as the population mean, as reported by Levanon and colleagues (2021). There was not a significant difference between employment satisfaction for individuals with physical disabilities who own service dogs (M=4, sd=1) when compared to the population mean (M=4) conditions; t(5)=0, p=0.5. The 95 percent confidence interval for the mean difference between the average employment satisfaction was 2.758 and 5.242. Results indicate that individuals with physical disabilities who own service dogs reported the same employment satisfaction as the general public. This means there was not a significant difference overall and the null hypothesis for research question five was accepted.

To examine research question six, two correlational analysis were conducted. The first correlation analysis explored the relationship between the time participants owned their service dogs and their length of employment, as measured by information gathered on the demographic questionnaire. There was a positive correlation between length of employment and length of service dog ownership, with r(3)=.645, p=.24. The coefficient of determination was $R^2$=.416. Results of this analysis indicate that there was a moderate, positive correlation between length of employment and length of service dog ownership. These results indicate there was a correlation between the two outcomes, however, the correlation was not statistically significant and there was not a statistically significant relationship between the outcomes.

For employment satisfaction, data was collected using the demographic questionnaire. The second correlation analysis explored the relationship between participants' employment satisfaction and their length of service dog ownership. There was a positive correlation between Employment satisfaction and length of service dog ownership, with r(3)=.976, p=.004. The

coefficient of determination was $R^2$=.953. Results of this analysis indicate that there was a very strong, positive correlation between employment satisfaction and length of service dog ownership. These results indicate that the correlation was statistically significant and there was a statistically significant relationship between the outcomes. Overall, for research question six, the null hypothesis was rejected, and the alternative hypothesis was accepted.

**Quality of Life**

The 16-item Flanagan QOLS, was used as the instrument to measure overall quality of life in the current study and was the final portion of the electronic survey. The QOLS asks participants to rate their responses to statements on a seven-point Likert-scale, ranging from Delighted to Terrible. In terms of scoring, each response on the Likert-scale received a rating, with Delighted receiving a score of seven and Terrible receiving a score of one. Item responses are then totaled to provide an overall score for the instrument. Scores on the QOLS range from 16 to 112. Table 6 provides each question on the QOLS, along with a visual representation of participant responses on each item.

A one-tailed, one-sample t-test was conducted to evaluate if overall quality of life for individuals with physical disabilities who owned service dogs was higher when compared with the population mean for the QOLS. According to Burckhardt & Anderson (2003), the average score on this instrument was M=90 for a healthy population and M=83 for individuals with rheumatoid arthritis. Since the current study was examining the quality of life for individuals with physical disabilities, a population mean of M=83 was utilized, as rheumatoid arthritis is considered a physical disability and more closely representants the current study's sample. There was not a significant difference in the quality of life scores for individuals with physical disabilities who own service dogs (M=77.4, sd=15.412) when compared with population mean

for the instrument (M=83) conditions; t(15)=-1.407, p=0.091. The 95 percent confidence interval for the mean difference between the two mean was 68.865 and 85.935. Results indicate that individuals with physical disabilities who own service dogs reported lower levels of quality of life when compared with other individuals who have physical disabilities and completed the QOLS. This difference in quality of life, however, was not significant overall and the null hypotheses for research question seven was accepted.

To examine research question eight, a correlational analysis was conducted. This correlational analysis explored the relationship between the time participants owned their service dogs and quality of life, as measured by the 16-item Flanagan Quality of Life Scale. There was a positive correlation between participants' quality of life and their length of service dog ownership, with r(13)=.1.69, p=.548. The coefficient of determination was $R^2$=.028. Results of this analysis indicate that there was a weak, positive correlation between participants' quality of life and their length of service dog ownership. Based on the results, there was not a significant relationship between length of service dog ownership and quality of life and the null hypothesis for research question two was accepted.

## Discussion

As established through previous studies, service dogs can impact independence in completing activities of daily living, (Crowe et al., 2014; Hall et al., 2017; Levey & Chappy, 2017; Rintala et al., 2002), employment (Crowe et al., 2014; Thorne et al., 2017; Yount et al., 2013), social connectedness (Champagne et al., 2016; Crowe et al., 2014; Guest et al., 2006; Hicks & Weisman, 2015; McNicholas & Collis, 2000), and quality of life (Camp, 2001; Hall et al., 2017; McIver et al., 2020; Rintala et al., 2002; Rodriquez et al., 2019) for individuals with physical disabilities. Due to the limited literature regarding the benefits of service dogs for

individuals with physical disabilities, the current study contributed to the empirical understanding of the benefits of using services as a holistic intervention.

The current study aimed to empirically examine the impact service dogs have on individuals with physical disabilities regarding their activities of daily living, social connection, employment, and quality of life. To achieve the study's goal and answer the research questions that guided the development of this study, a cross-sectional survey research design was utilized. For the purposes of the current study, 15 participant responses were analyzed as one participant reported having primary and secondary disabilities that could not be categorized as a physical disability, therefore, they did not meet eligibility criteria. Data analysis occurred in two phases. First, demographic information was analyzed using descriptive statistics to provide a picture of participant characteristics. Second, seven one-tailed, one-sample t-tests were conducted to explore the four constructs examined in the study.

**Findings**

Research question one sought to explore participants' independence in completion of activities of daily living, as measured by the PSMS-Self assessment. Results indicated that participants with service dogs had an above average level in their ability to complete activities of daily living (M=4.8). Examining specific activities of daily living, all participants (n=15, 100%) reported being able to eat and care for their own appearance completely independently. This finding may be due to the fact that participants reported disabilities that would primarily effect ambulation and mobility, not necessarily the fine motor skills required for feeding and maintaining appearance.

The remaining four activities of daily living all had at least three participants report that they required some assistance in completion. The item responses did not specify if the assistance

that the participants received was from another individual or if their service dogs were assisting them in completing the various activities. Interestingly, the item that most participants indicated they needed some assistance with was moving around their home environments (n=7, 46.7%). The item response "with some help" specified that help could be in the form of an assistive device or a service dog, but participants did not have the opportunity to specify the manner through which they received assistance. Because individuals with physical disabilities often have service dogs trained to assist with ambulation, this finding could likely be due to participants reporting the mobility assistance their service dog provides. Overall, participants reported a significant difference in their ability to complete activities of daily living and confirms the findings of previous literature that reported that service dogs assist their handlers in increasing their independence in completing activities of daily living (Allen & Blascovich, 1996; Hall et al., 2017; Lane et al., 1998; Lundqvist et al., 2019; Rintala et al., 2008; Rodriquez et al., 2019).

The second research question was developed to examine the relationship between participants' independence in completing activities of daily living and their length of service dog ownership. There was a weak, positive correlation and the relationship between the two outcomes were not statistically significant. Due to the complexity of disabilities, there could have been a number of confounding variables impacting the relationship between length of service dog ownership and independence in completing activities of daily living. For example, the primary task that the service dog is trained to assist their handler with could impact the relationship between the two outcomes. If the service dog is trained to assist their handler with mobility but not with feeding, length of ownership will not impact the person's ability to feed themselves since the dog is not trained to provide assistance with that activity of daily living. Additionally, because the scoring on the instrument utilized in the present study did not

differentiate between total dependence and requiring some assistance, the results may have been impacted for individuals reporting that their dogs provide them with some assistance in completing activities of daily living that they are unable to complete independently. For participants who report requiring some assistance in completing activities of daily living, it is expected their scores would not change as their length of service dog ownership increases, as their dog will continue providing some assistance and their responses would change only if they were able to complete activities of daily living completely independently. Future research would benefit from in depth explorations of the ways in which service dogs assist their handler's independence in completing activities of daily living.

The third research question was developed to explore the impact service dogs have on the social connectedness of their handlers. In the present study, social connectedness was examined in terms of three constructs: ability to participate in social activities, social isolation, and connectedness. All three constructs were measured using PROMIS instruments.

Examining the ability to participate in social activities, participants reported lower levels of participation (M=42.213) when compared with the population mean for the PROMIS Social Isolation short form (M=50). The area participants (n=4; 26.7%) reported the most difficulty with was having to limit the activities they participate in with others for fun. Completing leisure and family activities were the two items that most participants (n=2; 13.3%) reported the least difficulty in completing. Most item scores, however, indicated that participants sometimes had difficulty completing all activities assessed. An overall significant difference was found between the ability to participate in social activities for participants with physical disabilities who own service dogs when compared with the population mean for the instrument. This difference,

however, was in the negative direction, indicating that participants overall reported significantly lower abilities to participant in social activities.

In terms of social isolation, participants reported higher levels (M=54.667) of social isolation when compared with the population mean for the PROMIS Social Isolation short form (M=50). A majority of participant responses fell between Never and Sometimes on the Likert-scale for each of the eight items, indicating that most participants felt some level of social isolation. The items in which participants indicated the least social isolation included feeling that others barely know them (n=4; 26.7%). The areas in which participants experienced the most social isolation was regarding physical of being left out, with a majority of participants (n=13; 86.7%) reporting Sometimes and Usually. Overall, there was a significant difference between the perceived social isolation of participants when compared with the population mean for the instrument. This finding, however, indicates that participants experienced more social isolation when compared with the general public.

Examining companionship, participants reported lower levels (M=47.173) when compared with the population mean for the PROMIS Companionship short form (M=50). For all items, most participant responses fell between Rarely and Always on the Likert-scale, indicating that most participants had some level of companionship. Participants reported the most difficulty being able to find companionship when desired, with nine participants responding never, rarely or sometimes for this item (60%). Having company at home was rated the highest for the assessment amongst participants (n=5; 33.3%). While participants overall reported lower levels of companionship when compared with other who completed the PROMIS Companionship short form, these results did not produce a significant difference.

Overall, for research question three, there was a significant difference found on two of the three instruments used to assess social connectedness. These findings, however, indicated that participants had less ability to participate in social activities, experienced more social isolation and have less companionship when compared with other who took the assessments, which points to a lower sense of social connectedness in general for participants. An important factor to consider when examining these results was the social environment present during the time of the study. The study was conducted in 2021, a year after the coronavirus pandemic commenced. During the pandemic, research indicates that social isolation and loneliness increased for the general public due to lockdowns and precautions taken to prevent the spread of the virus (Banerjee & Rai, 2020; Murayama et al., 2021). This was especially true for individuals with disabilities, as they are in a high-risk category for experiencing negative and more life-threatening symptoms of the virus (National Council on Disability, 2021). It was important to consider the impact the pandemic had on the social connectedness construct of the current study and future research should consider reexamining this construct as the effects of the pandemic continue to diminish.

The fourth research question was developed to examine the relationship between participants' social connectedness and their length of service dog ownership. Results of the correlation analyses indicate that there were weak, positive correlations and there were not significant relationships between participants' ability to participate in social activities and their length of service dog ownership, as well as between companionship and length of service dog ownership. In terms of social isolation, there was a moderate, negative correlation and statistically significant relationship between participants' social isolation and their length of service dog ownership. The results indicate that social isolation decreases as length of service

dog ownership increases. Interestingly, there was a correlation between social isolation and length of service dog ownership but not between companionship or ability to participate in social activities and length of service dog ownership. While COVID-19 may have also impacted participants' ability to participate in social activities, as previously discussed, additional confounding variables must have impacted the relationship between social isolation and companionship and length of service dog ownership. Companionship and participating in social activities are typically utilized for the prevention of social isolation, so the findings of the present study are surprising given the fact that only social isolation was related to length of service dog ownership. Social connectedness is a complex construct that consists of many facets. It is interesting that one aspect of social connectedness was related to length of service dog ownership, but the other variables examined were not related. Additional research could benefit from a more thorough exploration of the multiple facets that impact a service dog owner's social connectedness.

The fifth research question was developed to explore the impact service dogs have on their handlers' employment. The demographic questionnaire captured participants' employment status and if employed, their employment satisfaction and length of time employed. Of the 15 participants in the study, five of the participants (33.3%) were employed either employed part-time, full-time, or self-employed. Of the individuals employed, participants were employed with their current employer from four to over 10 years with an average of 5.6 years. Results indicated that participants had been employed with their current employer longer than the general public in the United States (M=4.1) (Bureau of Labor Statistics, 2020) and this difference in length of employment was not statistically significant.

In terms of employment satisfaction, participants responses ranged from Neutral to Very Satisfied, with the sample average reflecting participants were satisfied (M=4) with their work. The sample average was in line with the national employment satisfaction level (Levanon et al., 2021). As the sample mean and the population mean were the same, a significant difference was not observed in terms of employment satisfaction. Due to the small sample size and limited questions exploring employment satisfaction, as well as other factors that impact employment (i.e., availability of transportation, job availability, etc.) additional research is needed to further explore the impact of service dogs on employment for individuals with physical disabilities.

The sixth research question was developed to examine the relationship between participants' length of employment and employment satisfaction and their length of service dog ownership. Results indicate that there was a very strong, positive correlation and a statistically significant relationship between employment satisfaction and length of service dog ownership. There was a moderate, positive correlation between participant's length of employment and their length of service dog ownership, however, this correlation was not statistically significant. It is important to consider the small sample size when examining the relationship between the employment variables and length of service dog ownership. Having a sample size of five participants for the employment construct could have impacted the results of the correlation and impacted the generalizability of the findings. It will be important for future researcher to further examine the relationship between employment satisfaction and length of service dog ownership to validate the findings of the present study. Additionally, having a larger sample size could further confirm if the moderate, positive correlation observed in the relationship between length of employment and length of service dog ownership is statistically significant when more service dogs owners are surveyed. Conducting further regarding the relationship between employment

and length of service dog ownership will further validate the use of service dogs a holistic intervention to improve employment outcomes for individuals with physical disabilities.

Research question seven was developed to examine the overall quality of life for individuals with physical disabilities who own service dogs. Results of the QOLS indicate that participants in this study had a lower perception of quality of life (M=77.4) when compared with other individuals with physical disabilities who completed the assessment. Responses for each of the 16 items primarily fell between Pleased and Mixed on the seven-point Likert-scale. Participants indicated the most dissatisfaction in terms of their health, with seven participants (46.7%) indicated either Mostly Dissatisfied or Unhappy. Given the fact that individuals with disabilities tend to have more negative perceptions of their general health, this finding was not surprising (Groomes et al., 2014; Hall et al., 2017; Thorne et al., 2017). Previous studies do indicate, however, that individuals with service dogs report higher perceptions of general health when compared to other with disabilities (Groomes et al., 2014; Hall et al., 2017; Refson et al., 1999; Thorne et al., 2017). The findings of this study indicate a need for more research to be conducted to fully explore the impact service dogs have on their handlers' overall health.

Reading, listening to music, and observing entertainment was rated most positively by participants on the QOLS, with 13 participants (86.7%) reporting being Delighted to Mostly Satisfied. The two remaining participants reported Mixed I, so there were no responses on the negative side of the Likert-scale. This finding was not surprising as these activities tend to be completed alone and can occur in the home setting. An unexpected finding, however, was the response to close friends on the QOLS. This item received the second highest ratings in terms of satisfaction, with 12 participants (80%) reporting being Delighted to Mostly Satisfied. Of the three remaining participants, two participants (13.3%) reporting Mixed physical and one (6.7%)

indicating being Unhappy. This finding was surprising, given the results of the PROMIS Companionship short form. Responses on the PROMIS Companionship short form indicated more negative perceptions regarding their ability to have companionship when desired and having someone with whom they could relax or have fun with. Since most participants reported having close friends but also indicated more negative perceptions of their companionship, additional research could explore how individuals with physical disabilities who own service dogs perceive their friendships and how their friendships impact their social connections.

Finally, research question eight was developed to examine the relationship between participants' quality of life and length of service dog ownership. Results of the correlation analysis between quality of life and length of service dog ownership indicate that there was a weak, positive correlation. This correlation, however, was not a significant relationship between the two outcomes. Much like social connectedness, quality of life is comprised of multiple, complex facets, increasing the change of confounding variables existing that impact the relationship between quality of life and length of service dog ownership. Research could benefit from an exploration of which aspects of quality of life are related to length of service dog ownership. Additionally, conducting future research with a larger sample size could further validate the trends in length of service dog ownership and quality of life. This may require conducting a longitudinal study since quality of life is an individualized concept as people place different meaning and value into the various aspects that constitute overall quality of life. Conducting future research would allow for further validation of the use of service dogs as an individualized and holistic intervention for individuals with physical disabilities.

## Limitations of the Study

As with all research, the current study has a number of limitations, including a lack of participant diversity, the recruitment process, the distribution method, the study design, external environmental factors present during data collection, and the low response rate. These limitations impacted the study, and the recruitment process and external environmental factors potentially contributed to the low response rates from both service dog organizations and their constituents. Due to the low response rate, as seen in previous similar studies, and unforeseeable circumstances (i.e., COVID-19), the researcher adapted the research process (e.g., recruitment methods and adapting the study to a pilot study) to best address the limitations as they arose during data collection while maintaining the integrity of the study. The limitations of the current study also provided the researcher with insight into methods to improve future research.

The first limitation of the study was the lack of participant diversity. While participants were diverse in their primary and secondary disabilities, ages, educational backgrounds, marital status, employment status, length of time owning a service dog, and previous service dog ownership, there were still a number of characteristics in which they were less diverse. Specifically, there was a disproportionate number of study participants who identify as female and who identify as Caucasian/White. Additionally, despite the researcher contacting service dogs organizations across the nation, the majority of participants (n=10, 66.7%) resided in the physical and there were no participants from the South. As for length of time employed, a majority of the employed participants (n=4; 80%) had been employed for four to five years. Finally, all participants (n=15; 100%) currently owned a service dog and there were no participants awaiting service dog placement. The lack of diversity in some participant characteristics reduced the generalizability

of the study findings. In future research, it will be important to have more diversity amongst participants in all characteristics to increase the generalizability of the findings.

The recruitment process was the second major limitation of the study. The recruitment process required the researcher to obtain a completed site authorization letter from each organization indicating that the organization would send the recruitment email and flyer to their constituents. Once the site authorization was obtained, the researcher was required to submit an IRB modification containing each site authorization letter and obtain approval before sending the recruitment email and flyer to the organizations for distribution to their constituents.

This recruitment process imposed limitations that potentially impacted the data collection process. Specifically, it impacted the researcher's responsiveness to service dog organization representatives. The researcher responded to all communications from service dog organization representatives within one business day, however, the time between receipt of the site authorization letter and sending the organization representative the recruitment email and flyer to distribute to constituents varied up to one month depending on the length of time for IRB approval. Organizations with longer wait periods had the most potential to negatively impact the study. While the researcher cannot account for the time it takes the IRB to approve each modification, in future studies, the researcher could send follow up emails or make follow up calls while the modifications are being approved to provide organization representatives with periodic updates. This would allow the researcher to maintain more open lines of communication, resulting in more information regarding organizational, personnel and other factors that impact the data collection process.

In a similar vein, the recruitment method used potentially created a third limitation in the current study. In an effort to expedite communication with all 113 service dog organizations, the

researcher chose email as the initial and primary method of communication. Telephone communication was ultimately employed at the end of the data collection process however, the researcher began the data collection process utilizing email. Both communication methods, however, have benefits and limitations that impacted the study. While electronic communication took less time to complete and allowed the researcher to quickly provide all service dog organizations with information and the site authorization letter, security features within email carriers, such as spam filters, could have prevented organization representatives from ever receiving the contact attempt. Additionally, organization representatives could have screened and deleted the email based on the subject line, before reading the email body and understanding the purpose of the study. Finally, organization representatives could have read the email, with or without the intent to reply, and never responded since the email is marked a read and no longer notifies the representative that they have not replied.

On the other hand, phone communications are more personal than emails, since phone calls provide human-to-human contact and allowed the researcher to more accurately gauge organization representatives' verbal and nonverbal communications and respond accordingly (Dash et al., 2016). Phone calls also allowed for real-time conversation, where the researcher answered organization representatives' questions as they arose. The main limitation of phone communications is the time it takes to complete the calls, resulting in fewer organization contacts each day. Limitations of phone communications also occur if the organization representative does not pick up. During the recruitment process of the current study, the researcher left voice messages for each of  eight organizations that did not answer.

The study design also potentially imposed limitations. The self-report design threatened the internal validity of the study because a non-probability sampling method was used, and the

independent variable was not manipulated. Additionally, self-selection bias may have occurred with the study having a nonprobability sample. Finally, social desirability may have occurred due to the use of self-report surveys, which potentially negatively impacts internal validity.

As previously discussed, during the data collection process, the COVID-19 pandemic was occurring, which could have negatively impacted response rates in several ways. COVID-19 impacted people with disabilities in a number of unique ways. Specifically, while many people during the pandemic experienced increased physical of isolation, anxiety and depression, individuals with disabilities faced compounding barriers, such as lack of access to medical treatments, increased communication barriers caused by wearing masks, and having to choose between working to provide an income or self-isolation to prevent health complications associated with COVID-19 (Banerjee & Rai, 2020; Murayama et al., 2021; National Council on Disability, 2021). This is not to say that every person with a disability experienced these negative symptoms during the pandemic. However, individuals who experienced negative symptoms due to the pandemic may have been less likely to complete the survey, contributing to the low response rate. The pandemic also potentially impacted participant responses on the survey, especially the social connectedness construct, as previously discussed. Overall, the pandemic potentially impacted the present study in several ways, from individuals' willingness to participate in the study to impacting participant responses to survey items.

The recruitment process, recruitment method, and external environmental factors all contributed to the low response rate which was the final limitation of the study. A low response rate was not surprising, however, due to the precedent of previous literature that also had smaller sample sizes. The low response rate over the year that data collection occurred, required the researcher to adapt the study into a preliminary study. While the pilot study provides valuable

initial information regarding individuals with physical disabilities who own service dogs in terms of the four study constructs, a larger study is still required to enhance the validity of the study and produce results that can more reliably be generalized to the larger population. The smaller sample size of the study diminished the power, and a larger sample size would have allowed the research to better evaluate the four constructs of the study.

**Implications for Future Research**

Future studies exploring the holistic benefits of service dogs for individuals with disabilities could benefit from more in-depth examination of the secondary benefits of service dogs. The present study found similar findings as observed in previous literature in terms of increased employment and independence in completing activities of daily living, reinforcing what is already understood about the positive impacts service dogs. The findings regarding social connectedness and overall quality of life, however, contradicted findings of previous literature that indicated that individuals who own service dogs have higher levels of social connectedness and perceived quality of life when compared to other who do not have service dogs. This finding could be due to a number of environmental and social factors present at the time of the study and future social and environmental changes could further impact individuals' with service dogs perceptions. Subsequent research could be designed to more fully examine social connectedness and quality of life to identify contributing factors that influence participants' perceptions.

Additionally, a new study with a larger sample size would allow for more generalizability of findings. A larger sample size would also allow for more high-level statistical analyses of data (i.e., MANOVA, ANOVA, etc.), therefore providing a deeper understanding on the impacts service dogs have on their handlers lives. Additionally, a longitudinal study with a larger sample size would generate more clarity on the lasting secondary benefits of service dogs, while

accounting for social and environmental changes throughout the life of the service dog. These alternative research designs could potentially improve researchers', service dog organizations', service dog owners', and funding agencies' understanding of the secondary benefits of service dogs, thus potentially increasing the availability and funding resources for service dogs.

Additionally, a study with a larger sample size exploring differences on study constructs between participants on a waiting list to receive a service dog and participants who already own a service dog is needed. Often, assessments are normed using samples that do not consist of individuals with disabilities, causing the assessments to be less reliable and valid when used with individuals with disabilities. Having a comparison of individuals on a waiting list to receive a service dog and participants would allow for a more accurate interpretation of results, as opposed to a comparison against the general public. This would also allow for more sophisticated analysis of data, which would also potentially control for external social and environmental factors that impact participant responses, potentially producing more generalizable results.

A qualitative study that examines participants' personal experiences with holistic benefits of owning service dogs is also necessary in expanding the understanding of the secondary benefits of service dogs. Exploring participants' experiences would allow for a fuller understanding of holistic benefits, as opposed to a quantitative study that pre-identifies constructs to explore. The qualitative study would potentially allow for emergent and lesser examined benefits to be identified, as well as explore the personal experiences of participants.

Finally, studies exploring the benefits of service dogs for individuals with disabilities other than physical disabilities are still needed. Because the secondary benefits of service dogs may be exclusive to one disability population due to the unique barriers and challenges they face, additional research is needed to provide a deeper understanding of service dogs of individuals

with diverse disabilities. These types of studies have the potential to identify emergent secondary benefits and provide researchers with an understanding of additional gaps in the literature. Furthermore, future research can improve service providers' understanding of the benefits of service dogs as an intervention to holistically and positively impact their handlers' lives. This understanding can not only impact the services vocational rehabilitation counselors provide, but also the evidence-based best practices counselor educators impart on novice counselors.

As for the implications on the fields of counseling and counseling education, the present study, as well as additional research, has the potential to shape the way counselors work with and understand clients, as well as how counselor educators prepare students for working with individuals with disabilities. First, the present study and future research on the topic has the potential to influence counselor educators' understanding of trends related to their clients' experiences related to the four study constructs when compared with the general public regardless of if their clients own service dogs. By comparing individuals with physical disabilities who own service dogs to the general public, counselor educators can glean a better understanding of the unique challenges their clients with physical disabilities face in terms of their independence in completing activities of daily living, social connectedness, employment and quality of life. Counselor educators can also use this information to better prepare students to work with clients who have physical disabilities by altering students to potential challenges their clients may face and assist students in identifying various best practices that can be employed to promote successful client outcomes.

Additionally, the current and future studies impact the fields of counseling and counseling education by making counselor educators and, in turn, their students aware of the unique benefits and challenges service dog handlers face in a variety of settings to promote the

continued use of service dogs as a holistic intervention. By sharing the benefits of service dogs with students, counselor educators can encourage novice counselors to continue employing innovative interventions when working with clients, which promotes the development of new best-practices in the field. Not only do the benefits of service dogs need to be discussed, the challenges service dog handlers face need to be discussed with novice students to assist them in holistically understanding the impact a service dog has on their handler's life. Counselors, counselor educators and counseling students can also utilize their understanding of the benefits and challenges of utilizing services dogs when not only working with clients, but also when working with key stakeholders, such as their clients' employers, family and educators. By being able to discuss the benefits of service dogs and ways in which challenges can be addressed, counselor educators and counselors can promote the use of service dogs for individuals with disabilities and reduce the stigma associated with the use of service dogs in various settings.

Finally, the present study and future research has the potential to impact the field of counseling by contributing to the understanding of best practices and assist in validating the use of service dogs as a holistic intervention for individuals with diverse disabilities. Future research has the potential to not only validate the use of service dogs as a best practice when working with individuals with disabilities, but also to provide counselors with an innovative model or framework from which counselors can operate from and better understand their clients. One of the goals of the counseling profession is to continue identifying evidence-based practices that can assist counselors in better serving their clients' ever-changing needs. Current and future research regarding the use of service dogs as a holistic intervention for individuals with disabilities has the potential to promote the growth and development of best practices in the field

of counseling, as well as provide counselors and counselor educators with a better understanding of their clients and strategies to promote client success.

**Conclusion**

The goal of the present study was to contribute to the limited existing literature regarding the holistic benefits of service dogs, specifically by examining the impact of service dogs on individuals with physical disabilities in terms of their independence in completing activities of daily living, social connectedness, employment, and overall quality of life. The current study advanced the understanding of the holistic secondary benefits of service dogs as an intervention for individuals with physical disabilities and added to the existing literature on the topic. Results of the study found that participants experienced more independence in completing six activities of daily living, affirming the findings of previous literature.

In terms of social connectedness, participants reported higher levels of social isolation and lower levels of companionship and ability to participate in social activities. These findings indicate that overall, participants experienced lowered levels of social connectedness. This finding contradicts the results of previous literature, as preceding studies have found that owning a service dog has been linked to increased social connectedness for their handler. The results of the current study, however, may be reflective of the external social and environmental factors present at the time of the study (i.e., COVID-19).

Exploring the construct of employment participants, on average, were employed for longer periods of time when compared with the general public. Additionally, when examining employment satisfaction, participants; job satisfaction was reflective of the national average in that employed participants, on average, reported being satisfied with their employment. Finally, participants reported lower levels of quality of life when compared with other individuals with

physical disabilities. Again, this finding contradicts the findings of previous literature, indicating a need for additional exploration into quality of life for individuals with physical disabilities who own service dogs to be conducted.

Investigating the relationship between each of the study constructs and length of service dogs ownership, only employment satisfaction and social isolation produced very strong, positive and moderate, negative, statistically significant correlations, respectively. Independence in completing activities of daily living, ability to participate in social activities, companionship and quality of life all resulted in weak, positive, correlations when exploring the relationship between each construct and length of service dog ownership. Each of these correlations, however, were not statistically significant. The relationship between length of employment and length of service dog ownership produced a moderate, positive correlation, however, the correlation was not statistically significant. The small sample size may have impacted these correlations, as a larger sample size could have provided a more accurate and generalizable understanding of the relationships between each outcome and length of service dog ownership. Additionally, given the complex and multifaceted nature of each construct, confounding variable may be present and impacting the results of the correlational analyses making is more difficulty to effectively isolate the variables. Future research is needed to further explore the holistic impact of how owning a service dog impacts their handler's life throughout the duration of ownership.

While the present study did achieve its goal of contributing to the current literature regarding individuals with physical disabilities independence in completing activities of daily living, social connectedness, employment and quality of life, the present study contained limitations, indicating the need for additional research to be conducted. Limitations of the study

include the study design and a lack of diversity in certain participant characteristics (i.e., gender, race/ethnicity, geographical location, length of time employed and service dog ownership), which impacted the generalizability of the study. Additionally, the recruitment process, recruitment methods and social and environmental factors all potentially impacted participation in the study, resulting in a small sample size, which was the major limitation of the present study. Additional studies with larger sample sizes and alternative designs are needed to continue adding to existing literature and affirming the holistic benefits of service dogs for individuals with disabilities.

## References


Acosta, J. D., & Brooks, S. (2021). Descriptive statistics are power tools for organizational research practitioners. *Industrial and Organizational Psychology, 14,* 481-485.

Allen, K. & Blascovich, J (1996). The value of service dogs for people with severe ambulatory disabilities: A randomized controlled trial. *Journal of the American Medical Association, 275*(13), 1001-1006.

Air Carrier Access Act, 49, U.S.C. § 41705 (1986).

Americans With Disabilities Act [ADA] of 1990, Pub. L. No. 101-336, 104 Stat. 328 (1990).

Banerjee, A., Chitnis, U. B., Jadhav, S. L., Bhawalkar, J. S., & Chaudhury, S. (2009). Hypothesis testing, type I and type II errors. *Industry Psychiatry Journal, 18*(2), 127-131.

Banerjee, D. & Rai, M. (2020). Social isolation in COVID-19: The impact on loneliness. *International Journal of Social Psychology, 66*(6), 525-527.

Barker, R. T. Kinsely, J. S., Barker, S. B., Cobb, R. K. & Schubert, C. M. (2012). Preliminary investigation of employee's dog presence on stress and organizational perceptions. *International Journal of Workplace Health Management, 5*(1), 15-30.

Beetz, A., Kotraschal, K., Turner, D. C., Hediger, K., Uvnas-Moberg, K., & Julius, H. (2011). The effects of a real dog, toy dog and a friendly person on insecurely attached children during a stressful task: An exploratory study. *Anthrozoos, 24*(4), 349-368.

Bogart, K. R., Rosa, N. M. & Slepian, M. L. (2019). Born that way or became that way: Stigma toward congenital versus acquired disability. *Group Process & Intergroup Relations, 22*(4), 594-612.

Burckhardt, C. S. & Anderson, K. L. (2003). The quality of life scale (QOLS): Reliability, validity and utilization. *Health Quality of Life Outcomes, 1,* 60.

Branch, J. S. & Van Swearingen, J. M. (2002). Physical impairment and disability: Relationship to performance of activities of daily living in community-dwelling older men. *Physical Therapy, 82*(8), 752-761.

Braver, S. L. (2007). On splitting the tails unequally: A new perspective on one-versus two-tailed tests. *Educational and Psychological Measurement, 35*(2), 283-301.

Burckhardt, C. S., Anderson, K. L., Archenholtz, B., & Hagg, O. (2003). The Flanagan quality of life scale: Evidence of construct validity. *Health Quality Life Outcomes, 1,* 59.

Burchkardt, C. S., Woods, S. L., Schultz, A. A., & Ziebarth, D. M. (1989). Quality of life of adults with chronic illness: A psychometric study. *Research in Nursing Health, 12*, 347-354.

Bureau of Labor Statistics (2020). *Employee Tenure in 2020.* U.S. Department of Labor.

Camp, C. C. (2001). The use of service dogs as an adaptive strategy: A qualitative study. *American Journal of Occupational Therapy, 55*(5), 509-517.

Campo, R. A & Uchino, B. N. (2013). Humans' bonding with their companion dog: Cardiovascular benefits during and after stress. *Journal of Sociology & Social Welfare, 40*(4), 237-259.

Canine Companions for Independence. (2020). *Our dogs*. https://www.cci.org/assistance-dogs/Our-Dogs/

Carr, E. C. J., Wallace, J. E., Onyewuchi, C., Hellyer, P. W. & Kogan, L. (2018). Exploring the meaning and experience of chronic pain with people who live with a dog: A qualitative study. *Anthrozoos, 31*(5), 551-565.

Castel, L. D., Williams, K. A., Bosworth, H. B., Eisen, S. V., Hahn, E. A., Irwin, D. E., …DeVellis, R. F. (2009). Content validity in the PROMIS social health domain: A

qualitative analysis of focus group data. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care, and Rehabilitation, 17*(5), 737-749.

Cella, D., Riley, W., Stone, A., Rothrock, N., Reeve, B., Yount, S.,…Hays, R. (2010). The patient-reported outcomes measurement information system (PROMIS) developed and tested its first wave of adult self-reported health outcome item banks: 2005-2008. *Journal of Clinical Epidemiology, 63*, 1179-1194.

Cella, D., Yount, S., Rothrock, N., Gershon, R., Cook, K., Reeve, B., …Rose, M. (2007). The patient-reported outcomes measures information system (PROMIS): Progress of an NIH roadmap cooperative group during its first two years. *Medical Care, 45*(1), 3-11.

Champagne, A., Gagnon, D. H., & Vincent, C. (2016). Comparison of cardiorespiratory demand and rate of perceived exertion during propulsion in a natural environment with and without the use of a mobility assistance dog in manual wheelchair users. *American Journal of Physical Medicine & Rehabilitation, 95*(9), 685-691.

Chandler, C. K. (2018). Human-animal relational theory: A guide for animal-assisted counseling. *Journal of Creativity in Mental Health, 13*(4), 429-444.

Chandler, C. K., Portrie-Bethke, T. L., Barrio Minton, C. A., Fernando, D. M., & O'Callaghan, D. M. (2010). Matching animal-assisted therapy techniques and intentions with counseling guided theories. *Journal of Mental Health Counseling, 32*(4), 354-374.

Chow, S. M. K., Lo, S. K., & Cummins, R. A. (2005). Self-perceived quality of life of children and adolescents with physical disabilities in Hong Kong. *Quality of Life Resources, 14,* 415-423.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*(1), 155-159.

Cohen, S. P. (2002). Can pets function as family members? *Western Journal of Nursing Research, 24*(6), 621-638. Corkran, C. M. (2015). An extension of me. *Society & Animal, 23*(3), 231-249.

Crowe, T. K., Paerea-Burns, S., Sedillo, J. S., Hendrix, I. C., Winkle, M. & Deitz, J. (2014). Effects of partnerships between people with mobility challenges and service dogs. *American Journal of Occupational Therapy, 68*(2), 194-202.

Crowe, T. K., Sanchez, V., Howard, A., Western, B., & Barger, S. (2018). Veterans transitioning from isolation to integration: A look at veteran/service dog partnership. *Disability and Rehabilitation, 40*(24), 2953-2961.

Dash, J., Haller, D. M., Sommer, J., & Perron N. J. (2016). Use of email, cell phone and text message between patients and primary-care physicians: Cross-sectional study in a French-speaking part of Switzerland. *BMC Health Services Research, 16,* 549.

de Almeida, M. A. R. P., Abalos-Medina, G. M., Villaverde-Gutierrez, C., Gomes-de Lucena, N. M., Ferreria-Tomaz, A., & Perez-Marmol, J. M. (2019). Effects of an ergonomic program on the quality of life and work performance of university staff with physical disabilities: A clinical trial with three-month follow-up. *Disability and Health Journal, 12,* 58-64.

de la Vega, R. Molton, I. R., Miro, J., Smith, A. e., & Jensen, M. P. (2019). Changes in perceived social support predict changes in depressive symptoms in adults with physical disability. *Disability and Health Journal, 12,* 214-219.

Department of Housing and Urban Development (2008). Pet ownership for the elderly and persons with disabilities. *Federal Register, 73*(208), 63834-63838.

DeWalt, D. A., Rothrock, N., Yount, S. & Stone, A. A. (2007). Evaluation of item candidates: The PROMIS qualitative item review. *Medical Care, 45*(5), 12-21. Dorstyn, D. S.,

Mathias, J. L. & Denson, L. A. (2011). Psychosocial outcomes of telephone-based counseling for adults with an acquired physical disability: A meta-analysis. *Rehabilitation Psychology, 56*(1), 1-14.

Dunn, D. S. & Brody, C. (2008). Defining the good life following acquired physical disability. *Rehabilitation Psychology, 53*(4), 413-435.

Fine, A. H. (2018). The role of therapy and service animals in the lives of persons with disabilities. *Revue Scientifique et Technique-Office International des Epizooties, 37*(1), 141-149.

Flanagan, J. C. (1978). A research approach to improving out quality of life. *American Psychologist, 33*, 138-147.

Flanagan, J. C. (1982). Measurement of the quality of life: Current state of the art. *Archive Physical Medicine and Rehabilitation, 63*, 56-69.

Francis, G., & Jakicic, V. (2021). Equivalent statistics for a one-sample t-test. *Behavior Research Methods.*

Glenn, M. K. (2013). An exploratory study of the elements of successful service dog partnership in the workplace. *ISRN Rehabilitation, 2013,* 1-10.

Goldberg, L. D., McDonald, S. D. & Perrin, P. B. (2019). Predicting trajectories of posttraumatic growth following acquired physical disabilities. *Rehabilitation Psychology, 64*(1), 37-49.

Grice, J. W. & Iwsaki, M. (2007). A truly multivariate approach to MANOVA. *Applied Multivariate Research, 12*(3), 199-226.

Grise, E., Boisjoly, G., Maguire, M., & El-Geneidy, A. (2019). Elevating access: Comparing accessibility to jobs by public transport for individuals with and without a physical disability. *Transportation Research Part A, 125,* 280-293.

Groomes, D. A. G., Clemons, A., Hulme, S., Kort, K. & Mesibov, G. (2014). Utilizing assistive dogs in integrated employment settings: Multidisciplinary elements to consider for individuals with ASD. *Journal of Vocational Rehabilitation, 40*, 165-173.

Guest, C. M., Collis, G. M. & McNicholas, J. (2006). Hearing dogs: A longitudinal study of social and psychological effects of deaf and hard-of-hearing recipients. *Journal of Deaf Students & Deaf Education, 11*(2), 252-261.

Hall, S. S., MacMichael, J., Turner, A. & Mills, D. S. (2017). A survey of the impact of owning a service dog on quality of life for individuals with physical and hearing disabilities: A pilot study. *Health & Quality of Life Outcomes, 15*(59), 1-9.

Hartwig, E. K., & Smelser, Q. K. (2018). Practitioner perspectives on animal-assisted counseling. *Journal of Mental Health Counseling, 40*(1), 43-57.

Hassan, Z. A., Schattner, P., & Massa, D. (2006). Doing a pilot study: Why is it essential? *Malays Family Physician, 1*(2-3), 70-73.

Heimlich, K. (2001). Animal-assisted therapy and the severely disabled child: A quantitative study. *Journal of Rehabilitation, 67*(4), 48-54.

Hicks, J. R. & Weisman, C. J. (2015). Work or play? An exploration of the relationships between people and their service dogs in leisure activities. *Journal of Leisure Research, 47*(2), 243-262.

Hoagwood, K. E., Acri, M., Morrissey, Mm., & Peth-Pierce, R. (2017). Animal-assisted therapies for youth with or at risk for mental health problems: A systematic review. *Applied Developmental Science, 21*(1), 1-13.

Hokoishi, K., Ikeda, M., Maki, N., Nomura, M., Torikawa, S., Fujimoto, N., Fukuhara, R., Komori, K., & Tanabe, H. (2001). Interrater reliability of the Physical Self-maintenance

Scale and the Instrumental Activities of Daily living Scale in a variety of health processional representatives. *Aging & Mental Health, 5*(1), 38-40.

Horowitz, S (2008). The human-animal bond: Health implications across the lifespan. *Alternative and Complementary Therapies, 14*(5), 251-256.

House, L. A., Neal, C., & Backels, K. (2018). A Doggone way to reduce stress: An animal assisted intervention with college students. *College Student Journal, 52*(2), 199-204.

In, J. (2017). Introduction of a pilot study. *Korean Journal of Anesthesiology, 70*(6), 601-605.

Jegatheesan, B., Beetz, A., Ormerod, E., Johnson, R., Fine, A., Yamazaki, K., Dudzik, C., Garcia, R. M., Winkle, M., & Choi, G. (2014). The IAHAIO definitions for animal assisted intervention and guidelines for wellness of animals involved. *IAHAIO White Paper,* 1-10.

Jones, T. L., Baxter, M. A. J., & Khanduja, V. (2013). A quick guide to survey research. *Annals, 95*(1), 5-7.

Kim, T. K. (2015). T test as a parametric statistic. *Korean Journal of Anesthesiology,* 68(6), 540-546.

Kim, H. J., Hong, S., & Kim, M. (2014). Living arrangements, social connectedness, and life satisfaction among Korean older adults with physical disabilities: The results from the national survey on persons with disabilities. *Journal of Developmental Physical Disabilities, 27,* 307-321.

Kim, T. K., & Park, J. H. (2019). More about the basic assumptions of t-test: Normality and sample size. *Korean Journal of Anesthesiology, 72*(4), 331-355.

Laccourreye, O., Jankowski, R., & Lisan, Q. (2020). Mastering the descriptive statistics used in otorhinolaryngology. *European Annals of Otorhinolaryngology, Head and Neck Diseases, 138*(5), 387-390.

LaFollette, M. R., Rodriguez, K. E., Ogata, N. & O'Haire, M. E. (2019). Military veterans and their PTDS service dogs: Associations between training methods, PTSD severity, dog behavior and the human-animal bond. *Frontiers in Veterinary Science, 6*(23), 1-11.

Lane, D. R., McNicholas, J., & Collis, G. M. (1998). Dogs for the disabled: Benefits to recipients and welfare of the dog. *Applied Animal Behaviour Science, 59*, 49-60.

LaPlante, M. P. (2010). The classic measure of disability in activities of daily living is biased by age but an expanded IALD/ADL measure is not. *The Journal of Gerontology Series B: Psychological Sciences and Social Sciences, 65*(6), 720-732.

Lawton, M. P. & Brody, E. M. (1969). Assessment of older people: Self-maintaining and instrumental activities of daily living. *Gerontologist, 9,* 179-186.

Levanon, G., Abel, A. L., Li, A., & Rong, C. (2021). Job satisfaction in 2021. *The Conference Board.*

Levey, J. A. & Chappy, S. L. (2017). Service dogs in the perioperative setting. *AORN Journal, 105*(4), 365-369.

Levin, K. A. (2006). Study design III: Cross-sectional studies. *Evidence-based Dentistry, 7*, 25-33.

Lorefice, L., Fenu, G., Frau, J., Coghe, G., Marrosu, M. G., & Cocco, E. (2018). The impact of visible and invisible symptoms on employment status, work and social functioning in Multiple Sclerosis. *Work, 60,* 263-270.

Lowenthal, M. F. (1964). *Lives in distress*. Basic Books.

Lumsdaine, S. & Thurston, M. (2017). Growing up in the mainstream world: A retrospective enquiry into the childhood experiences of young adults with a physical disability. *International Journal of Disability, Development and Education, 64*(2), 182-197.

Lundqvist, M., Alwin, J. & Levin, L. A. (2019). Certified service dogs – A cost-effectiveness analysis appraisal. *PLoS ONE, 14*(9), 1-13.

Lundqvist, M., Levin, L., Roback, K. & Alwin, J. (2018). The impact of service and hearing dogs on health-related quality of life and activity level: A Swedish longitudinal intervention study. *BMC Health Services Research, 18*(497), 1-9.

Mackelprang, R.W. & Salsgiver, R.O. (2016). *Disability: A diversity model approach in human service practice.* NY: Oxford University Press.

Marshall-Pescini, S., Schaebs, F. S., Guagg, A., Meinert, A., Deschner, T. & Range, F. (2019). The role of oxytocin in the dog-owner relationship. *Animals, 9*¸ 792-811.

Maharaj, N., Kazanjian, A. & Borgen, W. (2018). Investigating in human-animal bonds: What is the psychological return on such investment? *Society & Leisure, 41*(3), 393-407.

Maharaj, N., Kazanjian, A. & Haney, C. J. (2016). The human-canine bond: A sacred relationship. *Journal of Spirituality in Mental Health, 18*(1), 76-89.

Malik, P. B. & Anton, P. W. (2013). Supporting students with severe physical disabilities: The Illinois model. *The Journal of College and University Student Housing, 40*(1), 172-185.

McDonald, J. J. (2006). Take your dog to work day – Everyday. *Employee Relations Law Journal, 32*(3), 86-95.

McIver, S. Hall, S. & Mills, D. S. (2020). The impact of owning a guide dog on owners' quality of life: A longitudinal study. *Anthrozoos, 33*(1), 103-117.

McNicholas, J. & Collis, G. M. (2000). Dogs as catalysts for social interactions: Robustness of the effects. *British Journal of Psychology, 91*, 61-70.

Menna, L. F., Santaniello, A., Gerardi, F., Sansone, M., DiMaggio, A., Di Palma, A., Perruolo, G., D'Esposito, V., & Formisano, P. (2019). Efficacy of animal-assisted therapy adapted to reality orientation therapy: Measurement of salivary cortisol. *Psychogeriatrics, 19*(5), 510-512.

Mills, J. T., & Yeager, A. F. (2012). Definitions of animals used in healthcare settings. *U.S. Army Medical Department Journal*, 12-17.

Mlinac, M. E. & Feng, M. C. (2016). Assessment of activities of daily living, self-care and independence. *Clinical Neuropsychology, 31*(6), 506-516.

Mlynaryk, C., Laberge, M., & Martin, M. (2017). School-to-work transition for youth with severe physical disabilities: Stakeholder perspectives. *Work, 58,* 427-438.

Moore, C. G., Carter, R. E., Nietert, P. J., & Stweart, P. W. (2011). Recommendations for planning pilot studies in clinical and translational research. *Clinical Translational Science 4*(5), 332-337.

Muramatsu, R. S., Thomas, K. J., Keong, S. L. & Ragukonis, F. (2015). Service dogs, psychiatric hospitalization and the ADA. *Psychiatric Services, 66*(1), 87-89.

Murayama, H., Okubo, R. & Tabuchi, T. (2021). Increase in social isolation during the COVID-19 pandemic and its association with mental health: Findings from the JACSIS 2020 study. *International Journal of Environmental Research and Public Health, 18*(16), 8238.

Nagasawa, M., Mitsui, S., En, S., Ohtani, N., Ohat, M., Sakuma, Y., …Kikusui, T., (2015). Oxytocin-gaze positive loop and the coevolution of human-dog bonds. *Science, 17*, 333-336.

National Council on Disability. (2021). *The impact of COVID-19 on people with disabilities*.

Nevala, N., Pehkonen, I., Koskela, I., Ruusuvuori, J., & Anttila, H. (2015). Workplace accommodation among persons with disabilities: A systemic review of its effectiveness and barriers or facilitators. *Journal of Occupational Rehabilitation, 25,* 432-448.

O'Callaghan, D. M. & Chandler, C. K. (2011). An exploratory study of animal-assisted interventions utilized by mental health professionals. *Journal of Creativity in Mental Health, 6*(2), 90-104.

Ochoa-Morales. A., Hernandez-Mojica, T., Paz-Rodriguez, F., Jara-Prado, A., Trujillo-de los Santos, Z., Sanchez-Guzman, M. A., Guerrero-Camacho, J. L., Corona-Vazquez, T., Flores, J., Camacho-Molina, A., Rivas-Alonso, V., & Davila-Ortiz de Montellano, D. J. (2019). Quality of life in patients with multiple sclerosis and its association with depressive symptoms and physical disability. *Multiple Sclerosis and Related Disorders, 36.*

Odendaal, J. S. (2000). Animal-assisted therapy – Magic or medicine? *Journal of Psychosomatic Research, 49,* 275-280.

Office for National Statistics. (2015). *How does personal well-being vary by sex, disability, ethnicity and religion?* https://www.bl.uk/collection-items/how-does-personal-wellbeing-vary-by-sex-disability-ethnicity-and-religion

O'Haire, M. E. (2013). Animal-assisted intervention for autism spectrum disorder: A systematic literature review. *Journal of Autism and Developmental Disorders, 43*(7), 1606–1622.

O'Haire, M. E. & Rodriquez, K. E. (2018). Preliminary efficacy of service dogs as a complementary treatment for posttraumatic stress disorder in military members and veterans. *Journal of Counseling and Clinical Psychology, 86*(2), 179-188.

Owenby, B. E. (2017). The potential of animal-assisted therapy within the supervisory alliance. *Journal of Creativity in Mental Health, 12*(1), 146-159.

Parenti, L., Foreman, A., Meade, B. J., & Wirth, O. (2013). A revised taxonomy of assistance animals. *Journal of Rehabilitation Research & Development, 50*(6), 745-756.

Parshall, D. P. (2003). Research and reflection: Animal-assisted therapy in mental health settings. *Counseling & Values, 48*(1), 48-56.

Paws with a Cause. (2020). *Service dogs.* https://www.pawswithacause.org/what-we-do/assistance-dogs/service-dogs/

Pichot, T. (2012). Animal assisted brief therapy: A solution focused approach (2ml ed.). New York, NY: Routledge.

Pierce, K. L. (2018). Understanding and working with service dog handlers. *Counseling Today, 61*(4), 42-46.

Ponto, J. (2015). Understanding and evaluating survey research. *Journal of the Advance Practitioner in Oncology, 6*(2), 168-171.

Power, E. (2008). Furry families: Making a human-dog family through home. *Social & Cultural Geography, 9*(5), 535-555.

PROMIS. (2022). Companionship scoring manual. *Patient-reported Outcomes Measurement Information System.*

PROMIS. (2021). Social isolation scoring manual. *Patient-reported Outcomes Measurement Information System.*

PROMIS. (2018). Ability to participate in social roles and activities. *Patient-reported Outcomes Measurement Information System.*

Refson, K., Jackson, A. J., Dusoir, A. E., & Archer, D. B. (1999). The health and social status of guide dog owners and other visually impaired adults in Scotland. *Visual Impairment Researcher, 1*, 95-109.

Rehabilitation Act of 1973, P. L. 93-112, 87 Stat. 355 (1973).

Repke, M. & Ipsen, C. (2019). Differences in social connectedness and perceived isolation among rural and urban adults with disabilities. *Disability and Health Journal, 13*, 1-7.

Rintala, D. H., Matmamoros, R., & Seitz, L. L. (2008). Effects of assistance dogs on persons with mobility and hearing impairments: A pilot study. *Journal of Rehabilitation Research and Development, 45*(4), 489-504.

Rintala, D. H., Sachs-Ericsson, N., & Hart, K. A. (2002). The effects of service dogs on the lives of persons with mobility impairments: A pre-post study design. *Spinal Cord Injury Psychosocial Process, 15*(2), 236-249.

Robinson III, E. H. & Curry, J. R. (2008). Institutional review boards and professional counseling research. *Counseling and Values, 53,* 39-52.

Rochon, J., & Kieser, M. (2011). A closer look at the effect of preliminary goodness-of-fit testing for normality for the one-sample t-test. *British Journal of Mathematical and Statistical Psychology, 64,* 410-426.

Rodriquez, C. F. S., Lima, F. J. C., & Barbosa, F. T. (2017). Importance of using basic statistics adequately in clinical research. *Brazilian Journal of Anesthesiology, 67*(6), 619-625.

Rodriquez, K. E., Bibbo, J. & O'Haire, M. E. (2019). The effects of service dogs on psychosocial health and wellbeing for individuals with physical disabilities or chronic conditions. *Disability & Rehabilitation,* 1-9.

Rudstam H., Strobel-Grower, W. & Cook, L. (2012). Beyond tallow ribbons: Are employers prepared to hire, accommodate and retain returning veterans with disabilities? *Journal of Vocational Rehabilitation, 36*, 87-95.

Ruxton, G. D., & Neuhauser, M. (2010). When should we use one-tailed hypothesis testing? *Methods in Ecology and Evolution, 1*(2), 114-117.

Sanders, C. L. (2000). The impact of guide dogs on the identity of people with visual impairments. *Anthrozoos, 3,* 131-139.

Sevak, P., Houtenville, A. J., Brucker, D. L., & O'Neill, J. (2015). Individual characteristic and the disability employment gap. *Journal of Disability Policy Studies, 26*(2), 80-88.

Singer, E. & Couper, M. P. (2009). Do incentives exert undue influence on survey participants? Experimental evidence. *Journal of Empirical Research on Human Research Ethics, 3*(3), 49-56.

Shaprio, D. R. & Martin, J. J. (2014). The relationship among sport self-perceptions and social well-being in athletes with physical disabilities. *Disability and Health Journal, 7,* 42-48.

Stapleton, M. (2016). Effectiveness of animal assisted therapy after brain injury: A bridge to improved outcomes in CRT. *NeuroRehabilitation, 39*(1), 135-140.

Thorne, K. L., Devlin, E. J. & Dingess, K. M. (2017). Service dogs for veterans with PTSD: Implications for workplace success. *Career Planning & Adult Development Journal, 33*(2), 36-38.

Titus, M. A. (2007). Detecting selection bias, using propensity score matching, and estimating treatment effects: An application to the private returns to a master's degree. *Research in Higher Education, 48*(4), 487-521.

Trainer, M. (2016). *Service dogs save lives.* Share America. https://share.america.gov/service-dogs-save-lives/#:~:text=In%20the%20United%20States%2C%20approximately,everywhere%20their%20human%20handlers%20go.

Turner, W. G. (2005). The role of companion animals throughout the family life cycle. *Journal of Family Social Work, 9*(4), 11-21.

United Nations Department of Public Information (2007). Disability and Employment. United Nations. https://www.un.org/development/desa/disabilities/resources/factsheet-on-persons-with-disabilities/disability-and-employment.html

United States Department of Labor, Bureau of Labor Statistics (2018). Employment status of the civilian noninstitutional population by disability status and selected characteristics, 2017 annual averages. [Economic News Release].

US Department of Justice. (2010)/ *Service animals.* https://www.ada.gov/service_animals_2010.htm

Vetter, T. R. (2017). Descriptive statistics: Reporting the answers to the 5 basic question of who, what, why, when, where and a sixth, so what? *Anesthesia and Analgesia, 125*(5), 1797-1802.

Walsh, F. (2009). Human-animal bonds I: The relational significance of companion animals. *Family Process, 48*(4), 462-480.

Whitehead, A. L., Julious, S. A., Cooper, C. L., & Campbell, M. J. (2016). Estimating the sample size for a pilot randomized trail to minimize the overall trial sample size for the external pilot and main trial for a continuous outcome variable. *Statistics Methods Medical Research, 25*(3), 1057 – 1073.

Winkle, M., Crowe, T. K. & Hendrix, I. (2011). Service dogs and people with physical disabilities partnerships: A systematic review. *Occupational Therapy International, 19*, 54-66.

World Health Organization [WHO]. (2020). *Depression.* https://www.who.int/news-room/fact-sheets/detail/depression

Yount, R., Ritchie, E. C., Laurent, M. S., Chumley, P. & Olmert, M. D. (2013). The role of service dog training in the treatment of combat-related PTSD. *Psychiatric Annals, 43*(6), 292-295.

Zutlevics, T. L. (2016). Could providing financial incentives to research participants be ultimately self-defeating? *Research Ethics, 12*(3), 137-148.

**Appendix A**
**Contact Organizations for Study Participant Recruitment**

Paws with a Cause
Service Dogs for America
Service dogs Inc.
Little Angels Service Dogs
The Seeing Eye
Leader Dogs for the Blind
Guide Dog Foundation
Mountain High Service Dogs
Compass Key
Amazing Tails
Guide Dogs for the Blind
Guide Dogs of America
Palmetto Animal Assisted Life Services
Mobility Service Dog
Buckeye Service Dogs
Freedom Paws
A New Leash on Life Inc.
Anthem Service Dogs
Susquehanna Service Dogs
New Hope Assistance Dogs Inc.
Northern Arizona Service Dogs
Arkansas Service Dogs
Florida Service Dogs Inc.
Canine Assistants
Dogs for Better Lives
Guiding Eyes
Assistance Dogs International
California Service Dog Academy
Roverchase
Canine Partners for Life
Canine Companions for Independence
Freedom Service Dogs of America
Guardian Angels Service Dogs Inc.
Southeastern Guide Dogs
Fieldco
Canine Partners of the Rockies
Victory Service Dogs
Guardian Service Dogs
Mobility Service Dogs Inc.
America's Vet Dogs
Warrior Canine Connection
Puppies Behind Bars
Angel Canines and Wounded Warriors
Wagmor Service Dogs
Oklahoma Service Dogs
Glad Wags Service Dogs
Joys of Living Assistance
Service Paws of Central Pennsylvania
Artic Paws for Service
Joint Forces K9 Group
Canines 4 Hope
Summit Assistance Dogs
NEADS
New Horizons Service Dogs
Smokey Mountain Service Dogs
Service Dogs Alabama
Educated Canines Assisting with Disabilities
The Service Dog Institute

Service Dogs for Veterans
Paws with Purpose
Fidos for Freedom
Diggity Dogs
Blue Star Service Dogs
Michigan Service Dogs LLC
Paws 4 People
Paws for Life USA
Assistance Dogs of Hawaii
Companion Training
Pawsitivity Service Dogs
Champ Assistance Dogs
Domesti-Pups
Custom K9 Service Dogs
Assistance Dogs of the West
SIT Service Dogs
ICAN
Custom Canines Service Dog Academy
Capable Canines of Wisconsin
Smoky Mountain Service Dogs
IOWA Service Dogs
Humanimal Bond
Retrieving Freedom Inc.
KSDS Assistance Dogs Inc.
Scout's Legacy Service Dogs
4 Paws for Ability
Brigadoon Service Dogs
Patriot Paws
Arizona Goldens LLC
Big Paws Canine Foundation
Disabilities Unleashed
Shore Service Dogs Inc.
Service Dog Project Inc.
Sterling Service Dogs
Canines for Service
Service Dogs of North Carolina
Hawaii Fi-do Service Dogs
Genesis Service Dogs
Paws Giving Independence
Helping Paws
Dog Tag Buddies
Uplifting Paws
Service Dogs of New Mexico
Heartland Service Dogs
MidAmerican Service Dog Foundation
Northern Indiana Service Dogs
WAGS
K9s 4 Mobility
CritterWork Service Dog Partners Inc.
PurposeFULL Paws
Definitely Dogs
Puppy Jake Foundation
Retrieving Independence
IDEA Service Dogs
Loving Angel Service Dog
Illini Service Dogs
Medical Mutts Service Dogs
Others as identified

## Appendix B
## Study Survey

**INFORMED CONSENT**
**for a Research Study entitled**
**"The Impact of Service Dogs on People with Physical Disabilities: Activities of Daily Living, Social Connectedness, Employment and Quality of Life"**
**IRB Approval Stamp:_____**

**You are invited to participate in a research study** to examine the impact service dogs have on individuals with physical disabilities regarding their activities of daily living, social connection, employment and quality of life. The study is being conducted by Leah Kartovicky, M.Ed., CRC, NCC, under the direction of Dr. Chippewa Thomas in the Auburn University Department of Special Education, Rehabilitation, and Counseling. You were selected as a possible participant because you are a person with a physical disability who either currently owns a service dog or are on a waiting list to receive a service dog and are age 19 or older.

**What will be involved if you participate?** If you decide to participate in this research study, you will be asked to complete an online survey. Your total time commitment will be approximately 20 minutes.

**Are there any risks or discomforts?** The risks associated with participating in this study are breach of confidentiality and coercion. To minimize these risks, I will store all collected using an online survey hosted by Qualtrics, which uses security measures and encryption, and all collected information will be stored in a BOX folder that employs double encryption security. Additionally, I remind you that your participation in this study is voluntary and will not affect your service dog status.

**Are there any benefits to yourself or others?** If you participate in this study, you can expect to assist in increasing the understanding of the impact service dogs have on activities of daily living, social connectedness, employment and quality of life for individuals with physical disabilities. I cannot promise you that you will receive any or all of the benefits described.

**Will you receive compensation for participating?** To thank you for your time you will be offered the opportunity to enter into a raffle drawing to win one of five $50 Amazon electronic gift cards. A link to enter into the raffle drawing will be provided upon completion of the survey.

**Are there any costs?** If you decide to participate, you will not incur any costs.

**If you change your mind about participating,** you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University, the Department of Special Education, Rehabilitation, and Counseling or the organization from which you received or will receive your service dog from.

**Your privacy will be protected.** Any information obtained in connection with this study will remain anonymous and confidential. Information obtained through your participation may be used to fulfill dissertation requirements, published in a professional journal and presented at professional conferences.

**If you have questions about this study,** contact Leah Kartovicky at lkk0002@auburn.edu. A copy of this document will be given to you to keep.

**If you have questions about your rights as a research participant,** you may contact the Auburn University Office of Research Compliance or the Institutional Review Board by phone (334)-844-5966 or e-mail at IRBadmin@auburn.edu or IRBChair@auburn.edu.

**HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SELECTION BELOW INDICATES YOUR WILLINGNESS TO PARTICIPATE.**

- ○ I consent.
- ○ I do not consent.

→

Age:

- ○ 19-29
- ○ 30-39
- ○ 40-49
- ○ 50-59
- ○ 60-69
- ○ 70-79
- ○ 80-89
- ○ 90 plus

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Gender:

- ○ Male
- ○ Female
- ○ Transgender
- ○ Other, please specify:

Race/Ethnicity:

- ○ African American/Black
- ○ Caucasian/White
- ○ Latino/Hispanic
- ○ Asian
- ○ Pacific Islander
- ○ Native American
- ○ Biracial
- ○ Multiracial/Multi-ethnic
- ○ Other, please specify:

Highest level of education completed, based on the US Census Bureau:

- ○ No schooling completed
- ○ Grades 1 through 11
- ○ 12th grade - no diploma
- ○ High School Diploma
- ○ GED or alternative credential
- ○ Some college credit - no degree
- ○ Associates degree
- ○ Bachelor's degree
- ○ Master's degree
- ○ Professional degree beyond bachelor's degree
- ○ Doctorate degree

---

Marital status:

- ○ Single, never married
- ○ Married
- ○ Widowed
- ○ Divorced
- ○ Separated

Region of residency in the United States based on the US Census Bureau

- ○ Northeast
- ○ Midwest
- ○ South
- ○ West

Please specify your disability/disabilities (check all that apply):

- [ ] Arthritis
- [ ] Brain injury
- [ ] Cerebral palsy
- [ ] Dwarfism
- [ ] Epilepsy
- [ ] Hearing impairment
- [ ] Multiple sclerosis
- [ ] Muscular dystrophy
- [ ] Spina bifida
- [ ] Spinal cord injury
- [ ] Visual impairment
- [ ] Other, please specify

Employment status:

- ○ Employed part-time
- ○ Employed full-time
- ○ Self-employed
- ○ Student
- ○ Military
- ○ Retired
- ○ Unemployed
- ○ Unable to work

If employed, how long have you been employed at your current place of work?

- ○ Not applicable
- ○ Less than 6 months
- ○ 6 months to a year
- ○ 1-2 years
- ○ 2-3 years
- ○ 3-4 years
- ○ 4-5 years
- ○ 5-6 years
- ○ 6-7 years
- ○ 7-8 years
- ○ 8-9 years
- ○ 10 or more years

If employed, please rate your satisfaction with your employment.

| | Very Dissatisfied | Dissatisfied | Neutral | Satisfied | Very Satisfied | Not Applicable |
|---|---|---|---|---|---|---|
| Employment satisfaction | ○ | ○ | ○ | ○ | ○ | ○ |

Do you currently own a service dog?

- ○ Yes
- ○ No

If you currently own a service dog, how long have you owned your service dog

- ○ Not applicable
- ○ Less than 6 months
- ○ 6 months to a year
- ○ 1-2 years
- ○ 2-3 years
- ○ 3-4 years
- ○ 4-5 years
- ○ 5-6 years
- ○ 6-7 years
- ○ 7 or more years

If you currently own a service dog, have you ever owned another service dog before receiving your current service dog?

- ○ Yes
- ○ No

---

Are you currently on a waiting list to receive a service dog?

- ○ Yes
- ○ No

If you are currently on a waiting list to receive a service dog, how long have you been on the waiting list?

- ○ Not applicable
- ○ Less than a month
- ○ 1-3 months
- ○ 3-6 months
- ○ 6-12 months
- ○ 1-2 years
- ○ 2-3 years
- ○ 3 or more years

If you are currently on a waiting list to receive a service dog, have you ever owned a service dog in the past?

- ○ Yes
- ○ No

→

Do you eat:

- ○ Without any help
- ○ With some help (e.g., cutting food, identifying for blind, etc.)
- ○ Someone feeds you

---

Do you dress and undress yourself:

- ○ Without any help (e.g., pick out clothes, dress and undress yourself, etc.)
- ○ With some help
- ○ Someone dresses and undresses you

---

Do you take care of your own appearance, things like combing your hair or shaving:

- ○ Without help
- ○ With some help
- ○ Someone does all these types of things for you

Do you get around your house/apartment/room:

- ○ Without help of any kind
- ○ With some help (e.g., from a person or using a walker, crutches, wheelchair, service dog, etc.)
- ○ You do not get around your home at all unless someone moves you

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Do you get in and out of bed:

- ○ Without any help or aid
- ○ Only with some help (e.g., from a person or a device)
- ○ You do not get in and out of bed unless someone lifts you

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Do you bathe - that is, take a bath, shower, or sponge bath:

- ○ Without any help
- ○ With some help (e.g., from a person or device
- ○ Only when someone bathes you (e.g., lifts you in and out, etc.)

Please select one response per item.

| | Never | Rarely | Sometimes | Usually | Always |
|---|---|---|---|---|---|
| I have trouble doing all of my regular leisure activities with others. | ○ | ○ | ○ | ○ | ○ |
| I have trouble doing all of the family activities that I want to do. | ○ | ○ | ○ | ○ | ○ |
| I have trouble doing all of my usual work (include work at home). | ○ | ○ | ○ | ○ | ○ |
| I have trouble doing all of the activities with friends that I want to do. | ○ | ○ | ○ | ○ | ○ |
| I have to limit the things I do for fun with others. | ○ | ○ | ○ | ○ | ○ |
| I have to limit my regular activities with friends. | ○ | ○ | ○ | ○ | ○ |
| I have to limit my regular family activities. | ○ | ○ | ○ | ○ | ○ |
| I have trouble doing all of the work that is really important to me (include work at home). | ○ | ○ | ○ | ○ | ○ |

→

Please select one response per item.

| | Never | Rarely | Sometimes | Usually | Always |
|---|---|---|---|---|---|
| I feel left out. | ○ | ○ | ○ | ○ | ○ |
| I feel that people barely know me. | ○ | ○ | ○ | ○ | ○ |
| I feel isolated from others. | ○ | ○ | ○ | ○ | ○ |
| I feel that people are around me but not with me. | ○ | ○ | ○ | ○ | ○ |
| I feel isolated even when I am not alone. | ○ | ○ | ○ | ○ | ○ |
| I feel that people avoid talking to me. | ○ | ○ | ○ | ○ | ○ |
| I feel detached from other people. | ○ | ○ | ○ | ○ | ○ |
| I feel like a stranger to those around me. | ○ | ○ | ○ | ○ | ○ |

→

Please select one response per item.

| | Never | Rarely | Sometimes | Usually | Always |
|---|---|---|---|---|---|
| Do you have someone with whom to have fun with? | ○ | ○ | ○ | ○ | ○ |
| Do you have someone with whom to relax? | ○ | ○ | ○ | ○ | ○ |
| Do you have someone with whom you can do something enjoyable? | ○ | ○ | ○ | ○ | ○ |
| Can you find companionship when you want it? | ○ | ○ | ○ | ○ | ○ |
| Do you have someone to keep you company at home? | ○ | ○ | ○ | ○ | ○ |
| Do you have someone to go with you to an event? | ○ | ○ | ○ | ○ | ○ |

→

Please select the response that best describes how satisfied you are at this time. Please answer each item even if you do not currently participate in an activity or have a relationship. You can be satisfied or dissatisfied with not doing the activity or having the relationship.

| | Delighted | Pleased | Mostly Satisfied | Mixed | Mostly Dissatisfied | Unhappy | Terrible |
|---|---|---|---|---|---|---|---|
| Material comforts - home, food, conveniences, financial security, etc. | O | O | O | O | O | O | O |
| Health - being physically fit and vigorous. | O | O | O | O | O | O | O |
| Relationships with parents, siblings, and other relatives - communicating, visiting, helping, etc. | O | O | O | O | O | O | O |
| Having and rearing children. | O | O | O | O | O | O | O |
| Close relationships with spouse or significant other. | O | O | O | O | O | O | O |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Close friends. | O | O | O | O | O | O | O |
| Helping and encouraging others, volunteering, giving advice, etc. | O | O | O | O | O | O | O |
| Participating in organizations and public affairs. | O | O | O | O | O | O | O |
| Learning - attending school, improving understanding, getting additional knowledge, etc. | O | O | O | O | O | O | O |
| Understanding yourself - knowing your assets and limitations - knowing what life is about. | O | O | O | O | O | O | O |
| Work - job or in home. | O | O | O | O | O | O | O |
| Expressing yourself creatively. | O | O | O | O | O | O | O |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Socializing - meeting other people, doing things, parties, etc. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Reading, listening to music, or observing entertainment. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Participating in active recreation. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Independence - doing for yourself. | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

→

Thank you for completing the survey!

Please use the link below if you would like to be entered into a survey for a chance to receive one of five $50 Amazon electronic gift cards.

https://auburn.qualtrics.com/jfe/form/SV_ePf9f9pPVcL7kQl

## Appendix C

## Raffle Survey

Thank you for participating in the survey. Please complete the information below to be entered into a raffle for a chance to win one of five $50 Amazon electronic gift cards.

First name

Last name

Email address

→

**Appendix D**

**Site Authorization Letter**

# Organization Letter Head Date

Auburn University Institutional Review Board c/o Office of Research Compliance
115 Ramsay Hall
Auburn, AL 36849

Dear IRB Members,

Please note that Ms. Leah Kartovicky, AU Graduate Student, has the permission of the [ORGANIZATION NAME] to conduct research using participants from our organization for her study, "The Impact of Service Dogs on People with Physical Disabilities: Activities of Daily Living, Social Connectedness, Employment and Quality of Life".

The purpose of this study is to examine the impact service dogs have on individuals with physical disabilities regarding their activities of daily living, social connection, employment and quality of life. The primary activity will be data collection through the use of an electronic Qualtrics survey. Only individuals with physical disabilities who have received a service dog from our organization and individuals with physical disabilities on the waiting list to receive a service dog from our organization are eligible to participate.

I agree to send out a link to Ms. Kartovicky's Qualtrics survey and the recruitment flyer to our organization's members to *recruit* participants for this study. Organization members will voluntarily choose to participate in this study, so Ms. Kartovicky will not have contact with participants, unless one of our organizations members is a winner of the voluntary raffle. I expect that this project will not end later than September 1, 2021.

Ms. Kartovicky has also agreed to provide to my office a copy of the Auburn University IRB-approved, stamped information letter before I send out the Qualtrics survey link for recruitment and will also provide a copy of any aggregate results. Any data collected by Ms. Kartovicky will be kept confidential and she will store all collected data using an online survey hosted by Qualtrics, which uses security measures and encryption, and all collected information will be stored in a BOX folder that employs double encryption security.

If there are any questions, please contact my office.

Signed,