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## *School of Occupational Therapy*

Canine-Assisted Therapy in the Pediatric Outpatient Setting

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May 2018



A capstone project submitted in partial fulfillment for the requirements of the Doctor of Occupational Therapy degree from the University of Indianapolis, School of Occupational Therapy.

Under the direction of the faculty capstone advisor:

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# A Capstone Project Entitled

Canine-Assisted Therapy in the Pediatric Outpatient Setting

Submitted to the School of Occupational Therapy at University of Indianapolis in partial fulfillment for the requirements of the Doctor of Occupational Therapy degree.

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Canine Assisted Therapy in the Pediatric Outpatient Setting

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### **Abstract**

The human-animal bond has existed and been documented on for centuries, and the use of animals in the healthcare setting has steadily increased since the 1980s. Animal-assisted therapy has been shown to improve aspects of occupational functioning and performance skills in children with ASD, ADHD, CP, Down syndrome, and other varying diagnoses, although little research is available for canine-assisted therapy (CAT) in the outpatient pediatric setting. The purpose of this project was to assess the effects on occupational performance of children engaging in a CAT program. Ten clients regularly engaged in CAT at a rate of once per week during occupational therapy sessions. Surveys were completed for each of the ten clients, as well as 11 other clients who interacted with the therapy dog during various therapy sessions. Of all the surveys completed, 75% of respondents reported that the presence of the therapy dog positively impacted the client's session. A qualitative question on the survey resulted in five major themes relating to the therapy dog: the therapy dog (a) improved client motivation or participation; (b) calmed or provided emotional regulation; (c) improved attention and/or social skills; (d) positively impacted sensory skills; or (e) positively impacted motor skills. Overall, the results from this project indicate that a CAT program can positively impact a client's occupational functioning, potentially allowing children to meet goals and develop skills at a faster rate.

### Canine Assisted Therapy in the Pediatric Outpatient Setting

The bond between humans and animals has existed and been documented on since the earliest domestication of animals (Fine, 2010). Some of the earliest accounts of human interaction with animals yielding an intentionally positive effect are in the late 17<sup>th</sup> century, when John Locke wrote about providing children with animals in order to encourage caring for others and to promote a sense of responsibility (Fine, 2010; Locke, 1699). In the 19<sup>th</sup> century, animals as pets became increasingly common in mental institutions in England as well as other countries (Fine, 2010). In 1880, Florence Nightingale (1946) wrote in *Notes on Nursing* that small animals often make great companions for chronically ill patients.

Psychiatrist Boris Levinson was one of the first to document the positive effects of the human-animal bond of dogs and children with autism (Levinson, 1997). In 1961 at a meeting for the American Psychological Association, Levinson theorized that children with autism engaging in playful interactions with dogs could improve social and communication skills, coining it “pet-oriented child psychotherapy” (Levinson, 1997, p. xii). Despite the healthcare system mostly eschewing animals in the hospital system in the early part of the 20<sup>th</sup> century, the topic of animals in the healthcare setting made a resurgence in the 1980s after a groundbreaking study that found patients in a cardiac care unit tended to live longer if they were pet owners (Fine, 2010; Friedmann et al., 1980).

The human-animal bond, defined as a “mentally beneficial and dynamic relationship between people and animals that is influenced by behaviors that are essential to the health and well-being of both” (American Veterinary Medical Association [AVMA], 2018b). Interactions may be, but are not limited to, emotional, psychological, or physical in nature.

Society's shift towards using the human-animal bond within the contemporary health care setting has resulted in its own terminology. The use of animals in a beneficial manner for humans, termed animal-assisted intervention (AAI), is an umbrella term with four distinct subgroups: animal-assisted therapy (AAT), animal-assisted education (AAE), animal-assisted activity (AAA), and AAI resident animals—animals who are owned by and live at a facility full time and are cared for by staff, volunteers, or residents (AVMA, 2018a). AAT is goal-directed and delivered or directed by a health or human services professional working within the scope of their practice (AVMA, 2018a). AAT has goals that may target aspects of one's physical, social, emotional, or cognitive functioning health, may be implemented in group or individual settings, and must be documented and evaluated (AVMA, 2018a).

### **Literature Review**

While there is extensive research supporting the use of animal-assisted therapy, much of the literature is limited to case studies or small sample studies (Andreasen et al., 2017). Furthermore, there is a lack of longitudinal research examining the effects of animal-assisted intervention over long periods of time. Compiled research for the purpose of this project focus on common diagnoses seen in children and adolescents by outpatient occupational therapists.

### **Benefits of Animal-Assisted Therapy**

Many positive outcomes have been documented as a result of engaging in AAT. Research supports the use of AAT for multiple populations, including adults and older adults with varying diagnoses as described by Cherniack and Cherniack (2014), but as previously stated, the following compiled research is limited to children and adolescents due to the scope of this project. As the human-animal bond can assist in improving emotional, psychological, or physical

functioning, children with various diagnoses and functional impairments can improve occupational functioning with implementation of AAT.

**Autism spectrum disorder (ASD).** ASD is defined as a spectrum of symptoms, abilities, and impairments (National Institute of Mental Health [NIMH], 2016b). Common characteristics include deficits in social skills or the ability to interact with others, frequent engagement in repetitive behaviors, and limited interests or activities, all of which impact one's daily functioning (NIMH, 2016b). According to the Centers for Disease Control and Prevention (CDC) (2017), an estimated 1 in 68 children have been identified with ASD. A meta-analysis completed by Berry et al. (2013) found that multiple studies showed interactions with therapy dogs significantly improved social interaction and reduced negative behaviors, including aggression and obsession, in children with ASD. Siewertsen, French, and Teramoto (2015) found that pet therapy can improve one or more functions affected by ASD and can positively impact a client's life outside of the therapy process. Furthermore, improved motor function and reduced physiological responses to stress have been shown (Siewertsen et al., 2015). O'Haire, McKenzie, McCune, and Slaughter (2014) found that after an 8-week AAA intervention in the classroom setting, children with ASD demonstrated significantly improved social functioning. Hallyburton and Hinton (2017) analyzed studies relevant to recreational therapy that examined the effect of canine-assisted therapy (CAT) on children with ASD, and found interaction with therapy dogs resulted in significant improvements in verbal social interactions.

**Attention-deficit/hyperactivity disorder (ADHD).** ADHD is characterized by inattention and/or hyperactivity or impulsivity that impacts development or functioning (NIMH, 2016a). Schuck, Emmerson, Fine, and Lakes (2015) found that after a 12-week canine-assisted intervention treatment combined with cognitive-behavioral therapy (CBT), children with ADHD

demonstrated greater reductions in the severity of ADHD symptoms compared to the control group, who received only CBT.

**Cerebral palsy (CP).** Defined as a disorder affecting movement, muscle tone, or posture as a result of damage to the developing brain, CP may present in myriad ways, affecting multiple areas of functioning, (Mayo Clinic, 2018). Elmaci and Cevizci (2015) found that two children with CP demonstrated improved symptoms including increased active muscle movements, bowel motility and regulation, instilled feelings of comfort, and reduced tonus by utilizing the body temperature and oscillations of a therapy dog, all of which helped facilitate motor learning. Rodrigues Porto and Bertoldo Quatrin (2014) found that a teenager with CP improved both gross motor skills and socioaffective skills after engagement in AAT in a single case study design.

**Down syndrome.** People with Down syndrome, a genetic condition resulting from an extra copy of chromosome 21, may demonstrate low muscle tone, cognitive impairments, delayed developmental milestones, impulsivity, poor attention, poor judgment, and delayed speech and language development (National Institute of Child Health and Human Development [NICHD], 2017). Satiansukpong, Pongsaksri, and Sasat (2016) found that after eight weeks of participation in an elephant-assisted therapy program in Thailand, children with Down syndrome demonstrated improved visual-motor integration skills. Furthermore, Griffioen and Enders-Slegers (2014) discovered significant improvements in verbalization and recognition of others and a decreased in impulsiveness in children with Down syndrome after a six-week dolphin-assisted therapy intervention.

**Other benefits.** AAT may also improve attention, cognitive functioning, confidence, motivation for self-improvement, feelings of responsibility, feelings of acceptance, and reduce maladaptive behaviors in children and adolescents with fetal alcohol spectrum disorder (FASD),



pervasive developmental disorder (PDD), intellectual disabilities (ID), conduct disorder, epilepsy, or victims of neglect and/or abuse (Martin & Farnum, 2002; Silva, Lima, Magalhães, & de Sousa, 2011; Maber-Aleksandrowicz, Avent, & Hassitosis, 2016; Williams & Metz, 2014; Vincent, Kropp, & Byrne, 2014; Parish-Plass, 2008). Additional potential benefits of AAT include positive behavior patterns and improved levels of trust, caring for others, empathy, cooperation and responsibility (Firmin, Brink, Firmin, Grigsby, & Trudel, 2016).

### **The Role of AAT in Occupational Therapy**

The field of occupational therapy's scope of practice includes facilitating participation in "everyday life activities (occupations) that people find meaningful and purposeful," and thus, any occupation-based goal aligns with AAT's inherent definition (American Occupational Therapy Association [AOTA], 2004). Skilled occupational therapists can use AAT as a tool for enhancing children's daily functioning and development in the occupations of activities of daily living (ADL), instrumental activities of daily living (IADL), education, work, play, leisure, and social participation (Andreasen et al., 2017). Because the presence of an animal tends to increase children's motivation to participate in purposeful activity, occupational therapists can use this to further facilitate development of various performance skills, including motor skills, process skills, and social interaction skills (Andreasen et al., 2017). Additionally, AOTA has defined pet care as an Instrumental Activity of Daily Living (IADL), further emphasizing the importance of the human-animal relationship as a daily occupation.

### **The Person-Environment-Occupation (PEO) Model.**

The Person-Environment-Occupation (PEO) Model served as a framework during this project for engaging in the occupational therapy process with a client. The Model focuses on the person, environment, and the occupations in which one engages (Law et al., 1996). The Model is

conceptualized as three overlapping circles, each one representing either the person, environment, or occupations, and all of which overlap (Strong et al., 1999). A person theoretically achieves harmony when the circles overlap as much as possible (Strong et al., 1999). The area in the center of all three circles overlapping represents occupational performance; the greater the overlap, the greater the occupational performance (Strong et al., 1999).

A person's satisfaction and occupational functioning is a direct result of the level of interaction between the three components of the PEO Model. Both internal and external changes may impact the PEO fit—the interaction between the person, environment, and occupation—potentially requiring modifications or adaptations in order to continue achieving functional outcomes (Strong et al., 1999). The focus of the PEO Model is to enable occupation via improvement of the PEO fit (Strong et al., 1999).

When considering a client's occupational performance, an occupational therapist may look at specific environments in which occupational engagement occurs to make changes. Altering the environment by implementing AAT to promote occupational participation allows for increased interventional opportunity, thus theoretically increasing successful outcomes for clients (AOTA, 2014). However, there is limited research on the effect AAT has in the occupational therapy setting and on the occupational functioning of children.

The purpose of this project was to quantitatively and qualitatively assess the effects on occupational functioning of children engaging in a canine-assisted therapy program in the outpatient pediatric setting.

## **Screening and Evaluation**

### **Setting**

The project took place at Hopebridge Pediatrics, LLC in Kokomo, Indiana. Hopebridge Pediatrics, LLC is an organization “committed to providing personalized therapy for children and their families touched by behavioral, physical, social, communication and sensory challenges, helping them live their best life possible” (Hopebridge, n.d.). The organization provides outpatient services including Applied Behavioral Analysis (ABA) for children on the autism spectrum, as well as occupational, speech, and physical therapies (Hopebridge, n.d.).

### **Participants**

Ten clients regularly engaged in CAT during occupational therapy sessions for a duration of approximately 15 weeks at the site. Clients who received outpatient OT by a specific certified occupational therapy assistant (COTA) on Tuesdays or Thursdays received traditional OT services in conjunction with CAT. Exclusion criteria for participation in the project included a history of aggression towards animals or inappropriate/maladaptive behavior towards the therapy dog during a session. One participant who participated in one session with the therapy dog was subsequently excluded from the project after demonstrating unfavorable behavior towards the dog. The primary diagnoses and number of clients for each for the clients who regularly engaged in CAT as part of their OT sessions is shown in Appendix A.

The average age of the 10 clients engaging in OT in conjunction with CAT was 9 years and 2 months at the beginning of the project. The youngest client was 4 years old and the oldest was 16 years old; there were eight males and two females. Nine clients identified as white (non-Hispanic or Latino) and one client identified as Hispanic/Latino. Occupational therapy sessions

lasted for one hour each week, with the exception of one client who received two 30-minute sessions per week, one on Tuesday and one on Thursday. Occupational therapy sessions were scheduled for the same time and day each week, although changes were made depending on need.

The following sections describe each of the nine clients who primarily engaged in CAT in conjunction with traditional OT services over the 15-week project, as well as their primary deficits in occupational performance.

**Client A.** Client A was a 9-year-old male with a primary diagnosis of Down syndrome. As of his most recent plan of care, Client A demonstrated continued deficits with core strength, gross motor skills, self-care skills, attention, cognition, and visual-motor skills.

**Client B.** Client B was a 6-year-old male with a primary diagnosis of ASD. Client B's goals for his most recent plan of care included sensory modulation skills, toleration of sensory input, and participation in a directed activity for greater than 20 seconds.

**Client C.** Client C was a 16-year-old female with a primary diagnosis of CP. Client C's goals for her most recent plan of care targeted improved strength and endurance, bilateral upper extremity (BUE) strength/endurance, unsupported static sitting balance, BUE active range of motion (AROM), dressing, fine motor skills, and motor control via weight bearing.

**Client D.** Client D, a 10-year-old male with ASD as a primary diagnosis, had goals on his plan of care targeting strength and endurance, feeding, dressing, self-care, toleration of sensory input, visual motor skills, and fine motor strength.

**Client E.** Client E was a 6-year-old male with a primary diagnosis of Down syndrome. Client E's plan of care goals included upper extremity and core strength and endurance, fine motor skills, dressing, sensory input, attention, and oral motor control.

**Client F.** Client F, a 12-year-old male, had diagnoses including unspecified disorder of psychological development and unspecified lack of expected normal physiological development in childhood. Client F's goals targeted BUE strength and endurance, dynamic standing balance, cognition, dressing, bilateral coordination, and attention.

**Client G.** Client G was an 8-year-old male with a diagnosis of ASD. Client G's goals included improving social skills, safety awareness, cognition, and IADL, including meal preparation.

**Client H.** Client H, a 7-year-old female, had diagnoses including: attention and concentration deficit, delayed milestone in childhood, and unspecified lack of coordination. In her most recent plan of care, Client H's goals included visual motor skills, handwriting, cognition, fine motor skills, and social skills.

**Client I.** Client I was an 8-year-old male with a primary diagnosis of ASD. Client I's goals as of his most recent plan of care targeted sensory modulation, transitioning skills, purposeful play, termination of activities, dressing, and implementation of a sensory diet.

**Client J.** Client J was a 4-year-old male with a diagnosis of ASD. Client J's goals were to improve fine and visual motor skills, self-care including feeding, tolerating brushing teeth, sitting tolerance at a tabletop, sensory modulation, and self-regulation.

**Potential impact of CAT on these clients.** As stated in the literature review, CAT has been shown to improve several components of occupational functioning in children. Engagement in CAT in conjunction with traditional OT services has been shown to improve social skills and verbal interactions for children with ASD diagnoses (Berry et al., 2013; Hallyburton & Hinton, 2017). Clients G and H had goals on their respective plans of care addressing social skills. While Client

H did not have an ASD diagnosis, interaction with the therapy dog may improve social skills for both of these specific clients for improved interaction in everyday activities.

Reduced severity of symptoms were found with children who had ADHD diagnoses after engaging in CAT during CBT compared to the control group who received only CBT (Schuck et al., 2015). While none of the participants regularly engaging in CAT at this site had an ADHD diagnosis, several participants had goals targeting attention, a component of functional cognition necessary for success in everyday occupations. Clients A, E, and F demonstrated deficits in attention to task and had specific goals targeting this performance skill. Engagement in CAT was hypothesized to improve these deficits throughout OT sessions.

Motor function was also found to improve for children with ASD diagnoses (Siewertsen et al., 2015). Motor skills are an important component of performance skills, necessary for engagement in everyday tasks, including ADLs (AOTA, 2014). Nearly all clients had goals related to motor skills, including gross motor skills, fine motor skills, and core strength: clients A, C, D, E, F, H, and J. While not all of these clients had ASD diagnoses, the benefits from CAT on motor function may still be observed.

Furthermore, motor learning was significantly impacted for children with CP as noted by two case studies completed by Elmaci and Cevizci (2015). Improved symptoms included increased active muscle movements, bowel motility and regulation, feelings of comfort, and reduced tonus by utilizing the body temperature and oscillations of a therapy dog (Elmaci and Cevizci). Two clients with diagnoses of CP participated in sessions with the therapy dog during this project in order to catalyze improvements in these specific areas of motor functioning.

As stated previously, visual-motor integration was improved for children with Down syndrome after an eight-week AAT intervention with elephants as evidenced by Satiansukpong et

al. (2016). Client A, who had a diagnosis of Down syndrome, had a specific goal targeting visual-motor integration. Clients D and H also had goals for visual-motor integration, but did not have a diagnosis of Down syndrome.

As the facility also provides outpatient ABA services to clients on the autism spectrum, many other children interacted with the therapy dog throughout the 15-week duration. Furthermore, the occupational therapist, other COTA, and therapists from other disciplines at the site (physical therapy and speech language therapy) had clients engage with the therapy dog during sessions. Data were collected from these clients, therapists, and caregivers to further qualitatively support the hypothesis.

### **Comparison to the Traditional Outpatient Setting**

There is not evident data on the prevalence of AAT in any setting, indicating it is likely not very common, especially in the outpatient pediatric setting. The organization in which the therapy dog was certified, Paws & Think, LLC (detailed further later), had only one other contract with a pediatric outpatient facility out of 25 healthcare venues. However, as stated above in the literature review, the benefits of AAT for children are extensive.

While all pediatric outpatient facilities likely provide traditional therapy services, including occupational, speech, and physical therapies, there is an opportunity to deliver improved benefits for clients as a result of AAT. Altering the environment by implementing a therapy dog, as described above in relation to the PEO model, may encourage a calming environment, provide a specific motivation for participation or accomplishments, and allows for a greater number of interventional opportunities compared to traditional treatment.

### **Implementation**

The 15-week project began in January of 2018 and continued until April of 2018. As described previously, the therapy dog came to the site on Tuesdays and Thursdays each week. The following sections describe how the project was implemented over the 15 weeks at the site.

#### **Therapy Dog**

The therapy dog that participated in this project was a two-year-old male Labradoodle, Oliver, the personal pet of the primary author of this article, an occupational therapy student at the University of Indianapolis. Oliver and the occupational therapy student became a certified therapy team through the organization Paws & Think, Inc. in preparation for this project. Paws & Think, Inc. is an organization based out of Indianapolis, IN, that trains and provides “therapy animals for both animal-assisted activities and animal-assisted therapies to youth, seniors and special needs individuals of all ages” (Paws & Think, Inc., n.d.). The organization partners with schools, detention centers, healthcare facilities, youth agencies, and more to serve at-risk populations (Paws & Think, Ind., n.d.).

The therapy team attended four skills classes once a week for an hour and 45 minutes each to prepare for the Paws & Think therapy team evaluation. Once the evaluation was complete and the therapy team became certified, the occupational therapy student attended a four-hour handler’s class to gain further knowledge about being a certified therapy team. Paws & Think produced a memorandum of understanding with the clinical site in order to establish and recognize each party’s responsibility, as is customary with each of Paws & Think’s partnerships. The therapy dog visited the clinic two days a week, on Tuesdays and Thursdays, from January to April 2018, for a total of 29 visits.

#### **Interventions**



Several interventional methods were used by means of the therapy dog throughout this process. The primary and most frequently used intervention was the alteration of the environment by implementation of the therapy dog into the normal therapeutic process. Human-animal interaction (HAI) is defined as “any manner or interaction between a person and a non-human animal” (Purdue University College of Veterinary Medicine, 2017). While a few children did not acknowledge the therapy dog during sessions, the majority of children interacted with the therapy dog at least once throughout a session, at the very minimum by simply looking at and acknowledging him, thus qualifying as a HAI. Beetz, Uvnäs-Moberg, Julius, and Kotrschal (2012) completed a review of 69 studies researching human-animal interactions and the role of oxytocin, concluding that the interaction with animals correlates with an increase in oxytocin levels in humans, thus promoting social interaction, reduce stress and anxiety, and improve human health. Further methods for intervention are detailed below.

**Petting.** Most children interacted with the therapy dog via petting. Repetitive petting is a form of tactile sensory input, addresses AROM of an upper extremity, and can impact passive range of motion (PROM). Furthermore, petting can reduce blood pressure and the heart rate of those petting the animal (Grossberg & Alf, 1985; Handlin et al., 2011).

**Brushing.** Brushing the therapy dog as an intervention targeted AROM, PROM, and specific grasp patterns. The main brush used throughout this project had a cylindrical handle, therefore addressing the client’s cylindrical grasp. While seated and brushing the therapy dog, many clients crossed midline, using their right upper extremity (RUE) to brush the dog on the left side of them, and vice versa.

**Giving treats.** Giving treats to the therapy dog promoted fine motor skills, specifically a client's pincer grasp and in-hand manipulation. The clients often had to reach into a bag and retrieve only one treat, relying on inherent stereognosis skills.

**Obstacle courses.** Several children engaged in obstacle courses with the therapy dog involved. Obstacle courses address gross motor skills, overall strength, activity tolerance, and cognitive skills—specifically, the ability to follow multi-step directions, attend to a task for a certain amount of time, and recall steps in a specific order. The implementation of a favored activity, such as giving treats to the therapy dog, during obstacle courses increased client motivation and therefore success in these activities.

**Walks.** Walks outside were frequently used to target community integration skills, activity tolerance, safety awareness, and gross motor strength. Integrating the therapy dog into these walks similarly increased client motivation and allowed for improved outcomes.

**Motivation.** Overall, the therapy dog served as a motivator throughout sessions. If a client requested play time with the therapy dog, it was used as motivation for completing an unfavorable or particularly difficult task. Other therapists also occasionally used the therapy dog as a motivator or comfort for their clients.

## **Leadership**

Self-directed leadership was an integral component of this project, called a Doctoral Capstone Experience (DCE), which was the final step for the occupational therapy student in achieving a Doctorate in Occupational Therapy. Planning for this project began in the fall of 2016, with more serious and concrete plans beginning to form in the spring of 2017, in accordance with appropriate coursework at the University of Indianapolis. The occupational therapy student relied on connections from previous fieldwork experiences to initiate planning of this project; however,

this experience was different than that of the past, as the student was responsible for reaching out to potential sites independently from the school's fieldwork coordinators. Furthermore, the student had to conduct an informal needs assessment at the proposed location in order to determine if the project was even plausible. Factors that were considered throughout this process include the target population, the caseload quantity of the COTA, and the relationship between the facility and the CAT organization, Paws & Think.

Organizing this project took many months of planning and training. The student had to foremost advocate for the profession of occupational therapy to Paws & Think and explain how this project would be beneficial for both parties. Once an agreement was made between both, the student was responsible for becoming an official Paws & Think volunteer and subsequently a certified therapy team with the therapy dog, which took multiple weeks and many hours.

Upon initiation of the project, the student demonstrated leadership skills in many ways. Primarily, the student was responsible for juggling the therapy dog and the client simultaneously. The student had to make often quick decisions based upon the environment, the client, and inherent knowledge. Occasionally, the therapy dog was omitted from sessions due to various circumstances based on the student's professional judgement. The student was responsible for advocating for the therapy dog, making sure to not cause undue or excessive stress. Because of that, it was agreed upon that the therapy dog visit the clinic only two days per week, with necessary changes being need based upon the therapy dog's observed stress levels. Attending the handler's course put on by Paws & Think gave the student the necessary resources to observe clear and unclear signs of stress emanating from the therapy dog.

During sessions, balancing the therapy dog and the client could be very challenging. Some children had a tendency to run out of a designated treatment area due to impulsivity or deficits in

functional communication. The student had to advocate for herself and the therapy dog, as a team, and made sure that the site mentor, a COTA, was present during those treatment sessions so as to not over-stress or excite the therapy dog by chasing after a child.

On the days that the therapy dog was not there, the student was responsible for the COTA's caseload as customary with a typical fieldwork placement. Service provision was provided in a direct method, in accordance with traditional outpatient pediatric occupational therapy services.

### **Staff Development**

While the student had direct responsibility for the therapy dog, including being the only person allowed to handle him, the other staff members at the site had a unique role in this project, as well. Most of the staff members were aware of the role of occupational therapy in the lives of children with varying diagnoses or developmental delays. However, the staff had to be educated on how a therapy dog could positively impact these children within the scope of occupational therapy practice. By educating other staff members, including Registered Behavioral Technicians (RBTs) – those who deliver ABA therapy to children daily with an autism diagnosis – children engaged in more interactions with the therapy dog. RBTs were able to use the therapy dog as a reward for children completing required tasks.

### **Discontinuation and Outcomes**

The primary method for measuring the impact of CAT on certain clients was through a short survey, completed by either a client or a therapist (see Appendix B). The survey was created by the occupational therapy student. While the survey was written in a staff member's point of view (using the terminology "your client"), certain clients who demonstrated the ability to read, understand, and answer the questions on the survey were encouraged to fill one out themselves, as well. The survey consisted of three questions: a simple yes/no question asking whether the therapy

dog made a positive impact on the client, a mark-all-that-apply question asking which specific performance skills and/or client factors were noticeably improved during or after interaction with the therapy dog, and an open-ended question for further details or necessary information on the client-animal interaction.

### **Quality Improvement**

Quality improvement (QI) is defined by the American Academy of Family Physicians (AAFP) (2018) as “a systematic, formal approach to the analysis of practice performance and efforts to improve performance.” Solid quality improvement practices can improve efficiency, safety, and clinical outcomes (AAFP, 2018). The surveys were used for data as well as a method for quality improvement. Any pertinent suggestions from the surveys for alteration of the program were considered and, if appropriate and potentially beneficial, implemented. If a respondent selected “No” on question one—asking whether the therapy dog made a positive impact on the client’s day or session—the respondent then elaborated on that in question three. If the reason why the therapy dog did not positively impact the client was because of approach, then the approach was changed. For example, one client was particularly timid, nervous, and avoidant of the therapy dog during his first visit. This was noted, and during subsequent visits, the occupational therapy student adjusted the approach with the therapy dog in a gentler way in order for the client to feel more comfortable. Eventually, the child began smiling, petting, and laughing at the therapy dog, showing social skills which had rarely been seen before, and therefore demonstrating positive results for this project.

### **Results**

A total of 21 surveys were completed by therapists, RBTs, and clients. The occupational therapist, COTA, physical therapy assistant (PTA), and speech therapist all completed at least one

survey after a client engaged with the therapy dog during a session in order to provide multi-faceted data. The assigned COTA completed one survey per participant for each of the 10 participants regularly engaging in CAT weekly. The remaining 11 surveys were distributed and completed by the following: one by the speech therapist, two by the PTA, two by the registered occupational therapist, three by clients themselves, and three by RBTs.

**Quantitative data.** The first question, a yes/no question, asked: “Did interacting with Oliver positively impact you/your client’s session/day?” Sixteen out of 21 respondents selected “Yes,” indicating a positive impact for 75% of those who interacted with the therapy dog. The five responses were from the COTA in which the therapy dog was reported not to have positively impacted the client’s session, and were for Clients B, E, G, I, and J. Therefore, in the treatment group, five out of 10 participants regularly receiving canine assisted therapy were reported to have positively benefited from the experience.

The second question, a mark-all-that-apply question, asked respondents to mark which performance skills were noticeably improved during/after interaction with Oliver. The results are shown in Table 2 in Appendix A. Selections in this area were only made on 13 out of all 21 surveys; they were not filled out on the surveys in which “No” was selected on the first question or the surveys completed by RBTs. For the three surveys completed by clients themselves, the respective therapist for that session filled out the performance skill section. Seven respondents selected social skills, three selected gross motor skills, one selected fine motor skills, three selected sensory processing skills, three selected attention, eight selected motivation, six selected emotional regulation, zero selected cognition, and eight selected participation. Respondents selected motivation and participation improved the most out of the skills listed. Respondents also indicated

that social skills and emotional regulation were also noticeably improved with the presence of the therapy dog in a treatment session.

**Qualitative data.** The third and final component of the survey was open-ended and asked the respondent to elaborate on any previous answer or to provide any further details on the impact the therapy dog had on the respondent or their client. Themes were categorized from the open-ended responses by identifying commonly-used key words in each response. Five major themes emerged during classification of the open-ended responses. These five themes describe conditions in which the therapy dog: (a) provided motivation and/or increased participation, (b) provided a calming effect or assisted in the client's emotional regulation, (c) positively impacted a client's attention or social skills, (d) positively impacted a client's sensory skills, and (e) positively impacted a client's motor skills.

Commonly written words or phrases on the surveys that assisted in identifying the first theme, providing motivation and/or increasing participation, included: working harder, motivation, reinforcement (ABA terminology), an increase in productivity, and participation. Respondents frequently included words in their responses relating to a client's emotional regulation, such as "calming," "toleration," and "handling of different environments," resulting in the second theme: providing a calming effect or assisting in the client's emotional regulation. Respondents wrote words relating to attention or social skills, such as any social skill (for example, smiling), "improved focus," "stating wants/needs more frequently," and "improved attention to the task" or "surroundings/peers," and therefore the theme of a positive impact on a client's attention or social skills emerged. A respondent reported on a survey that the therapy dog positively impacted a client's "sensory diet," and therefore the fourth theme, a positive impact on a client's sensory skills, was identified. Lastly, respondents commonly wrote that the therapy dog assisted in motor skill

development with phrases such as “holding items,” “grasp patterns,” “range of motion (ROM),” and “gross motor skills,” resulting in the theme of the therapy dog positively impacting a client’s motor skills.

***Motivation and participation.*** Several respondents described how the therapy dog provided motivation to complete activities in order to engage or play with the dog. For example, one RBT reported that the therapy dog “increased [my client’s] productivity and motivated her to work hard in order to spend time with him.” Client H reported, “He makes me happy and I like to play with him. I work harder so that I can play with him.” Another RBT reported that she used the therapy dog as a reinforcement when her client was in a noncompliant behavior. The COTA described how the therapy dog provided motivation for Clients A and F: “Motivation/participation completing activity for access to canine,” and “will complete activity for Oliver reinforcement,” respectively. The speech therapist reported that although it was difficult to notice a difference during a short 30-minute speech therapy session, his client “participated enthusiastically and appeared to enjoy Oliver’s presence.”

***Calming and emotional regulation.*** The occupational therapist used the therapy dog to help calm a client during an activity the client perceived as fearful: “[She] was easily calmed while we addressed her gravitational insecurities. Today was the longest she’s ever tolerated our sensory activity.” The PTA used the therapy dog as motivation as well as emotional regulation, stating the therapy dog was a “reminder to finish all tasks during session that helped [my client] stay calm and focused.” Furthermore, with a different client, the PTA used the therapy dog to “handle a busy gym.” An RBT noted that a “calmer nature is noted” for her client during days that the therapy dog is present.



**Attention and social skills.** Client D demonstrated improved social verbalizations when in the presence of the therapy dog, with the COTA reporting that he “states wants/needs, requesting ‘pet dog.’” Furthermore, a newer client who was initially apprehensive “became interested in Oliver and sought out his attention,” per the COTA’s response. The COTA also reported that the client, who was often reserved, shy, and quiet, “smiled [this date] as well.” An RBT also reported that her client “is better attentive to surroundings/peers and has better social skills.” The COTA reported that Client A demonstrated improved “social skills interacting with canine.”

**Sensory skills.** As stated above, the occupational therapist reported that during one of her sessions with a client, “Oliver was a great addition to our sensory tactile play. My client was more apt to tolerate petting, touching, and wetness on her hands without a negative reaction.”

**Motor skills.** Client A also demonstrated improved gross motor skills during interactions with the therapy dog. The COTA reported that Client A was “riding bike with canine following.” Client C “held brush to brush Oliver improving active ROM grasp pattern and gross motor movement patterns.”

## **Summary**

Overall, the results indicate that the implementation of a therapy dog positively impacts most children who participate in canine assisted therapy. Surveys completed by various clients and staff members at the site produced results that showed 75% of respondents felt that the therapy dog had a positive impact on their client’s day or session. The COTA responded that of clients receiving CAT weekly, half demonstrated positive results after engagement with the therapy dog.

Although the quantitative results for the clients who regularly engaged in CAT week after week provided varied results, the qualitative results received from clients and their therapists were noteworthy. Five major themes emerged for the impact the therapy dog had on a client’s day or

session—those in which the implementation of the therapy dog: improved motivation or participation, calmed or provided emotional regulation, improved attention and/or social skills, positively impacted sensory skills, and positively impacted motor skills.

### **Societal Needs**

The immense growth in the field of occupational therapy throughout the past decade is indicative of the importance the discipline has in the evolving healthcare needs of society. Regarding the pediatric population, the Bureau of Labor Statistics (2018) reported that 24% of occupational therapists worked in outpatient therapy offices in 2016, although this statistic includes pediatric and adult practices. However, an additional 10% worked in elementary and secondary schools, which are exclusively pediatric settings by nature (Bureau of Labor Statistics, 2018). The ever-increasing need for occupational therapy services in society, as well as the consistently large percentage of practitioners working in a pediatric setting of some form, substantiates the need for innovative and evolving intervention strategies that result in improved client outcomes.

The positive impact CAT can have on children with varying developmental delays or deficits in occupational functioning is evident through the results from this project as well as the numerous studies cited throughout this paper. The use of a therapy dog via CAT supported improvements in occupational functioning in many children who interacted with the animal during sessions, including occupational performance, performance skills, performance patterns, and the client's context and environment. The fostering of these interactions allowed for children to meet goals earlier and develop skills faster. Overall, this may allow these children to progress through the therapy process quicker, thus allowing for time and space for treatment of other children in society with similar needs. Moreover, earlier achievement of age-appropriate functional

performance may have additional advantages in the long run that are not only personally valuable but also greatly impact society.

### **Overall Learning**

A significantly integral component throughout this entire process focused on professional and open communication with various staff members at the site, affiliates of the University of Indianapolis, clients, and their parents or guardians. The first, and arguably the most important, interaction was the initial communication between the occupational therapy student, the contact at Hopebridge (the COTA), and contacts at Paws & Think. The student was responsible for reaching out to said contacts professionally, proposing the project in a way that demonstrated potential benefits for both parties, and explaining the logistics for the entire project without appearing to cause too much extraneous stress.

Once in the clinic, the student was responsible for explaining the purpose of and advocating for the use of CAT in the outpatient pediatric setting. Many employees and parents were unaware of either the purpose of CAT or how CAT could be implemented into sessions. The communication between different people associated with the clinic allowed for improved understanding of the purpose of the therapy dog, as well as a platform for introducing nontraditional intervention techniques in the world of occupational therapy.

The occupational therapy student learned an unquantifiable amount throughout this entire process in preparation for future practice. Largely, the student learned how to independently form contacts, reach out to, and professionally communicate with various parties and organizations in preparation for future needs. The student also learned about and was able to actively practice networking, which allowed for improved inter- and intraprofessional relationships impacting both present and future connections.

On another note, the student learned the importance of applying current supported research into practice and the trials and tribulations that go along with implementing said novel research and techniques. Most research articles are not perfectly replicable, and even if they are, most therapy sessions do not go as planned in the pediatric population. The occupational therapy student learned throughout this project how to adjust the session to incorporate the therapy dog as much as possible for improved outcomes, but also, as stated previously, how to read the needs of both the therapy dog and the child and adjust the session as needed. This four-month project provided relevant experience needed for the student to use the therapy dog in future practice and continue on improving outcomes for children engaging in CAT.

The outpatient pediatric setting is fast-paced and often unpredictable. The occupational therapy student learned and honed throughout this process several professional development skills necessary for this setting, as well as others, including leadership, teamwork, responsibility, communication, and adaptability. The student, the first to complete a DCE at this clinical site, demonstrated leadership by being the primary planner and implementer of the project. As described above, the student was responsible for reaching out to various contacts, arranging plans for the project, participating in training to become a certified therapy team, and making adjustments throughout the project as needed. However, the student also relied heavily on teamwork and collaboration throughout the process, communicating frequently with the assigned site mentor (daily) and the faculty mentor (weekly) to make appropriate modifications, ensure the best methods for efficacious data collection, and implement the project in the most effective way.

The student grew immensely in the development of professional responsibility, juggling the role of a student implementing a new project and a student occupational therapist, gaining

advanced clinical skills on the days the therapy dog was not present. Three days a week, the student treated the entire caseload with intermittent (minimal) supervision from the COTA/occupational therapist and completed all respective documentation. The student also completed occupational therapy evaluations and updated clients' plans of care (POCs) as needed, all while also maintaining up to date on academic requirements.

The student demonstrated leadership and advocacy skills throughout the entire process by planning, executing, and adjusting the project as needed. The student was the sole party responsible for the success of this project, and therefore had to demonstrate leadership by proactively solving problems and identifying and implementing solutions. Advocacy was demonstrated by the student in multiple ways: first, the student advocated for the nontraditional practice of CAT in the pediatric setting to the clinical site as a potential DCE project, with evidence-based support; furthermore, the student advocated for the nontraditional area of practice to the various staff members, parents, and clients at the clinical site in order to promote the project's reach and, hopefully, improve results.

In summary, this project has taught the occupational therapy student many things about the importance of professionalism, leadership, advocacy, independence, and evidence-based practice as it relates to the world of occupational therapy. The impact this project has made will influence the occupational therapy student's practice greatly in the years to come, and has strategically guided the student into a better future practitioner.

## References

- American Academy of Family Physicians (AAFP). (2018). *Basics of quality improvement* [Website]. Retrieved from <https://www.aafp.org/practice-management/improvement/basics.html>
- American Occupational Therapy Association (AOTA). (2004). Scope of practice. *American Journal of Occupational Therapy*, 58(6), 673-677. <http://doi.org/10.5014/ajot.58.6.673>
- American Occupational Therapy Association (AOTA). (2014). Occupational therapy practice framework: Domain and process (3rd ed.). *American Journal of Occupational Therapy*, 68(Suppl. 1), S1–S48. doi:10.5014/ajot.2014.682006
- American Veterinary Medical Association (AVMA). (2018a). *Animal assisted interventions: Definitions* [Website]. Retrieved from <https://www.avma.org/KB/Policies/Pages/Animal-Assisted-Interventions-Definitions.aspx>
- American Veterinary Medical Association (AVMA). (2018b). *Human-animal bond* [Website]. Retrieved from <https://www.avma.org/KB/Resources/Reference/human-animal-bond/Pages/Human-Animal-Bond-AVMA.aspx>
- Andreasen, G., Stella, T., Wilkison, M., Szczech Moser, C., Hoelzel, A., & Hendricks, L. (2017). Animal-assisted therapy and occupational therapy. *Journal of Occupational Therapy, Schools & Early Intervention*, 10(1), 1-17.
- Beetz, A., Uvnäs-Moberg, K., Julius, H., & Kotrschal, K. (2012). Psychosocial and psychophysiological effects of human-animal interactions: The possible role of oxytocin. *Frontiers in Psychology*, 3(234). <http://doi.org/10.3389/fpsyg.2012.00234>
- Berry, A., Borgi, M., Francia, N., Alleva, E., & Cirulli, F. (2013). Use of assistance and therapy dogs for children with autism spectrum disorders: A critical review of the current

- evidence. *Journal of Alternative and Complementary Medicine*, 19(2), 73–80.  
doi:10.1089/acm.2011.0835
- Bureau of Labor Statistics. (2018). *Occupational outlook handbook, occupational therapists* [Website]. Retrieved from <https://www.bls.gov/ooh/healthcare/occupational-therapists.htm>
- Centers for Disease Control and Prevention (CDC). (2017). *Autism spectrum disorder (ASD)* [Website]. Retrieved from <https://www.cdc.gov/ncbddd/autism/data.html>
- Cherniack, E. P., & Cherniack, A. R. (2014). The benefit of pets and animal-assisted therapy to the health of older individuals. *Current Gerontology and Geriatrics Research*, 2014(623203).  
<http://doi.org/10.1155/2014/623203>
- Elmacı, D. T., & Cevizci, S. (2015). Dog-assisted therapies and activities in rehabilitation of children with cerebral palsy and physical and mental disabilities. *International Journal of Environmental Research and Public Health*, 12(5), 5046-5060.  
doi:10.3390/ijerph120505046
- Fine, A. H. (Ed.). (2010). *Handbook on animal-assisted therapy* (3rd ed.). London, UK: Elsevier Inc.
- Firmin, M. W., Brink, J. E., Firmin, R. L., Grigsby, M. E., & Trudel, J. F. (2016). Qualitative perspectives of an animal-assisted therapy program. *Alternative & Complementary Therapies*, 22(5), 204-213. doi:10.1089/act.2016.29073.mwf
- Friedmann, E., Katcher, A. H., Lynch, J. J., & Thomas, S. A. (1980). Animal companions and one-year survival of patients after discharge from a coronary care unit. *Public Health Reports*, 95(4), 307–312.

- Griffioen, R. E., & Enders-Slegers, M. (2014). The effect of dolphin-assisted therapy on the cognitive and social development of children with down syndrome. *Anthrozoös*, 27(4), 569-580. doi:10.2752/089279314X14072268687961580
- Grossberg J. M., Alf E. F. (1985). Interaction with pet dogs: Effects on human cardiovascular response. *Journal of the Delta Society*, 2(1), 20-27.
- Hallyburton, A., & Hinton, J. (2017). Canine-assisted therapies in autism: A systematic review of published studies relevant to recreational therapy. *Therapeutic Recreation Journal*, 51(2), 127-142.
- Handlin, L., Hydbring-Sandberg, E., Nilsson, A., Ejdebäck, M., Jansson, A., & Uvnäs-Moberg, K. (2011). Short-term interaction between dogs and their owners: Effects on oxytocin, cortisol, insulin and heart rate—An exploratory study. *Anthrozoös*, 24(3), 301-315.
- Hopebridge, LLC. (n.d.). *About Hopebridge* [Website]. Retrieved from <http://www.hopebridge.com/about/>
- Law, M., Cooper, B., Strong, S., Stewart, D., Rigby, P., & Letts, L. (1996). The Person-Environment-Occupation Model: A transactive approach to occupational performance. *Canadian Journal of Occupational Therapy*, 63, 9-23.
- Levinson, B. M. (1997). *Pet-oriented child psychotherapy* (2nd ed.). G. P. Mallon (Ed.). Springfield, IL: Charles C Thomas Publisher, Ltd.
- Locke, J. (1699). *Some thoughts concerning education* (Vol. XXXVII, Part 1). New York, NY: P.F. Collier & Son.
- Maber-Aleksandrowicz, S., Avent, C., & Hassiotis, A. (2016). A systematic review of animal-assisted therapy on psychosocial outcomes in people with intellectual disability. *Research in Developmental Disabilities*, 49-50322-338. doi:10.1016/j.ridd.2015.12.005



- Martin, F., and Farnum, J. (2002). Animal-assisted therapy for children with pervasive developmental disorders. *Western Journal of Nursing Research*, 24(6), 657-670.
- Mayo Clinic. (2018). *Cerebral palsy* [Website]. Retrieved from <https://www.mayoclinic.org/diseases-conditions/cerebral-palsy/symptoms-causes/syc-20353999>
- National Institute of Child Health and Human Development (NICHD). (2017). *Down syndrome* [Website]. Retrieved from <https://www.nichd.nih.gov/health/topics/downsyndrome>
- National Institute for Mental Health (NIMH). (2016a). *Autism spectrum disorder* [Website]. Retrieved from <https://www.nimh.nih.gov/health/topics/autism-spectrum-disorders-asd/index.shtml>
- National Institute for Mental Health (NIMH). (2016b). *Attention-deficit/hyperactivity disorder* [Website]. Retrieved from <https://www.nimh.nih.gov/health/topics/attention-deficit-hyperactivity-disorder-adhd/index.shtml>
- Nightingale, F. (1946). *Notes on nursing: What it is, and what it is not* (Ed.). New York, NY: Appleton-Century. (Original work published 1859)
- O'Haire, M. E., McKenzie, S. J., McCune, S., & Slaughter, V. (2014). Effects of classroom animal-assisted activities on social functioning in children with autism spectrum disorder. *Journal of Alternative and Complementary Medicine (New York, N.Y.)*, 20(3), 162-168. doi:10.1089/acm.2013.0165
- Parish-Plass, N. (2008). Animal-assisted therapy with children suffering from insecure attachment due to abuse and neglect: A method to lower the risk of intergenerational transmission of abuse? *Clinical Child Psychology and Psychiatry*, 13(1), 7–30. doi:10.1177/1359104507086338

Paws & Think, Inc. (n.d.). *About Paws & Think* [Website]. Retrieved from

<http://pawsandthink.org/about/>

Poleshuck, L. R. (1997). Animal-assisted therapy for children and adolescents with disabilities.

*Work*, 9(3), 285–293.

Purdue University College of Veterinary Medicine. (2017). *What is human-animal interaction?*

[Website]. Retrieved from <https://vet.purdue.edu/chab/ohaire/HAI.php>

Rodrigues Porto, J., & Bertoldo Quatrin, L. (2014). Effect of animal-assisted therapy on issues

related to motor performance and socioaffective interaction of a teen with cerebral palsy:

A case study. *Conscientiae Saude*, 13(4), 625-631. doi:10.5585/ConsSaude.v13n4.5093

Satiansukpong, N., Pongsaksri, M., & Sasat, D. (2016). Thai elephant-assisted therapy

programme in children with Down Syndrome. *Occupational Therapy*

*International*, 23(2), 121-131. doi:10.1002/oti.1417

Schuck, S. B., Emmerson, N. A., Fine, A. H., & Lakes, K. D. (2015). Canine-assisted therapy for

children with ADHD: Preliminary findings from the Positive Assertive Cooperative Kids

study. *Journal of Attention Disorders*, 19(2), 125-137. doi:10.1177/1087054713502080

Siewertsen, C. M., French, E. D., & Teramoto, M. (2015). Autism spectrum disorder and pet

therapy. *Advances in Mind-Body Medicine*, 29(2), 22–25.

Silva, K., Correia, R., Lima, M., Magalhães, A., & de Sousa, L. (2011). Can dogs prime autistic

children for therapy? Evidence from a single case study. *Journal of Alternative &*

*Complementary Medicine*, 17(7), 655-659. doi:10.1089/acm.2010.0436

Strong, S., Rigby, P., Stewart, D., Law, M., Letts, L., & Cooper, B. (1999). Application of the

Person-Environment-Occupation Model: A practical Tool. *Canadian Journal of*

*Occupational Therapy*, 66(3), 122-33. 10.1177/000841749906600304.

Vincent, B., Kropp, C., & Byrne, A. M. (2014). Animal-assisted therapy for fetal alcohol spectrum disorder. *Journal of Applied Rehabilitation Counseling, 45*(3), 3–9.

doi:10.1002/syn.21827

Williams, R. L., and Metz, A. E. (2014). Examining the meaning of training animals: A photovoice study with at-risk youth. *Occupational Therapy in Mental Health, 30*(4): 337-357.

## Appendix A

Table 1

*Participants and Diagnoses*

Number of clients	Diagnosis/Diagnoses
5	Autism spectrum disorder
2	Down syndrome
1	Cerebral palsy
1	Unspecified disorder of psychological development; unspecified lack of expected normal physiological development in childhood
1	Attention and concentration deficit; delayed milestone in childhood; unspecified lack of coordination

Table 2

*Quantitative Survey Responses*

Performance Skill	Number of Responses Marked as Noticeably Improved After Interaction with Therapy Dog
Social skills	6
Gross motor skills	3
Fine motor skills	1
Sensory processing skills	3
Attention	3
Motivation	7
Emotional regulation	6
Cognition	0
Participation	7

Appendix B  
Outcome Survey for CAT's Impact

Did interacting with Oliver positively impact your/your client's session/day?	Yes	No
Mark all which were noticeably improved during/after interaction with Oliver:	<ul style="list-style-type: none"> <li><input type="checkbox"/> Social skills (verbalizations, peer interaction, etc.)</li> <li><input type="checkbox"/> Gross motor skills</li> <li><input type="checkbox"/> Fine motor skills</li> <li><input type="checkbox"/> Sensory processing skills</li> <li><input type="checkbox"/> Attention</li> <li><input type="checkbox"/> Motivation</li> <li><input type="checkbox"/> Emotional regulation</li> <li><input type="checkbox"/> Cognition</li> <li><input type="checkbox"/> Participation</li> <li><input type="checkbox"/> Other: _____</li> </ul>	
Elaborate on anything listed above or any other impact Oliver has had on you/your client:	<hr/> <hr/> <hr/>	