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The Advantages and Disadvantages of Animal–Assisted Therapy in an Educational Setting

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**The Advantages and Disadvantages of Animal-Assisted Therapy
in an Educational Setting**

by

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A Starred Paper

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Chapter 1: Introduction

Animals have always been a key component to human existence. At first, animals were solely used for food but then quickly became work tools, protectors, and companions. Animals continue to play an important role in every day human lives. They are even used in therapy for the benefit of human beings. Therapy with the use of animals is called animal-assisted therapy (ATT). The basis of animal-assisted therapy shows that animals impact a person's well-being in a positive way. Most research in the area includes the impact of AAT on people's cognitive, emotional and social abilities (Berek, 2013). Schools, prisons, hospitals, and group homes are only a few examples of settings where AAT has been used. The common types of animals used in these therapies are horses, dogs, and rabbits. Although AAT is becoming a common form of therapy, it may still be viewed as an alternative therapy approach.

There have been documented successes and pitfalls of animal-assisted therapy and research on the subject continues to grow. The thought that animals could play an important role in the psychological well-being of humans was first seriously considered in 1980 by E. Friedmann and colleagues (Pichot & Coulter, 2011). They completed an experiment with a conclusion that people that had pets lived longer than those without. This study sparked many more that examined how animals can positively impact people's psychological and physical well-beings.

AAT may be seen as a benefit for the general population. Specifically, developing children are impacted by AAT on a larger scale. Berek (2013) explained that "AAT is also highly beneficial among children undergoing cancer treatment, helping them deal with isolation,

uncertainty, fear, and depression.” There are students in secondary school settings that deal with the concerns listed on a daily basis.

The purpose of this paper was to inform people of the benefits and disadvantages of animal-assisted therapy; specifically, within the secondary level special education population. As discussed previously, AAT has been used in many different settings and impacts people in many ways. In this paper I examine the positive and negative effects of canine AAT for students with disabilities in a secondary special education setting.

Research Question

There is one research question that guided this review of literature: What are the advantages and disadvantages of using animal-assisted therapy in a secondary classroom setting?

Focus of the Review

I identified eight studies conducted between the years of 2005 and 2018. The participants in the studies ranged from elementary aged children to young adults. The majority of the participants were diagnosed with a mental disorder, autism spectrum disorder, or had a learning disability. All of the participants were in a situation where they were expected to learn material, mostly specific social skills and reading. Articles based on the well-being of the animal used in therapy were also reviewed. Those writings were based on dogs and horses. All of the studies were conducted in the United States of America except for two conducted in Australia.

I found my research using EBSCO and ProQuest databases. I located related information to my topic using a set of key words including: *Animal-Assisted Therapy*, *Emotional/ Behavioral Disorder (EBD)*, *Autism Spectrum Disorder (ASD)*, *Learning Disabilities (LD)*, *secondary students*, *mental health*, *intervention*, and *animal rights*.

Importance of the Topic

I started working with people disabilities while in high school. First, I volunteered at True Strides in high school. True Strides is a therapeutic riding program that services people with a myriad of disabilities. Participants in True Strides achieve goals related to mobility, leisure, and cognitive functioning. Then, I worked at a group home as I completed my undergraduate degree. I witnessed the importance of animals in the clients' lives as I accompanied them to programs like True Strides, helped them take care of their pets, and coached them in interacting with animals they saw in public. Now, I am a learning disabilities teacher at the middle school level and see how animals impact my students' lives through their anecdotes and interest in class material related to animals.

I think interacting with animals can have a huge effect on the lives of students. In my experience I have seen the positive impact that animals have on people's well-being. Not everyone has access to the benefits of animal influence. To ensure that adding animal-assisted therapy into my classroom will have a positive effect, I need to ensure that I have weighed all the pros and cons of AAT. The intervention needs to be evidence based and show positive results.

Definitions of Key Terms

Animal-Assisted Therapy is a specific type of regulated therapy used with animals for the benefit of humans (U.S. National Library of Medicine, 2016).

Anxiety may be a diagnosis of a child that has fears and worries that impact their daily life (Center for Disease Control, 2017).

Autism Spectrum Disorder (ASD) is a developmental disability that can cause challenges in social, communication, and behavioral aspects. Individuals may engage in repetitive behaviors and react negatively to change (Center for Disease Control, 2017).

Emotional/ Behavioral Disorder (EBD) is defined by the Council for Exceptional Children (2018) as “a condition exhibiting one or more of the following characteristics over a long period of time and to a marked degree that adversely affects a child’s educational performance.”

Learning Disabilities (LD) is defined by the Learning Disability Association of America (2018) as “neurologically-based processing problems interfering with learning basic skills such as reading, writing and/or math.”

Chapter 2: Review of Literature

The purpose of this paper was to distinguish the advantages and disadvantages of using animal-assisted therapy (AAT) in an educational setting. In this chapter I reviewed eight studies that implemented animal-assisted therapy with dogs in education settings. The settings included an art room, classrooms, a counselor's office, library, and an entire school district. I conclude this chapter with a discussion of the impact animal-assisted therapy has on the therapy dog.

Public School Setting

Tate (2014) conducted a study to measure the effectiveness of animal-assisted therapy in a public school setting. The study took place in a rural school district in Missouri. The district used animal-assisted therapy in many ways including their special education program, reading programs, and fund-raising projects through the PTA. The following research questions were used to guide the study.

“What are the perceived effects of animal-assisted activities and therapies in public schools?”

“What are the observable effects of animal-assisted activities and therapies in the public school?”

Braxton is a trained therapy dog that has been in the researched district for 3 years. Initially, Braxton was brought into the district for assistance in the counseling office, but has been used in many other ways to service students as well.

A mixed methods design was implemented to gather qualitative and quantitative data to determine the viewpoints of teachers and administrators involved with animal-assisted therapy. Administrators and counselors were interviewed to determine their perceptions on animal-

assisted therapy. Teachers participated by completing a survey assess their opinions about the animal-assisted therapy program.

Triangulation was used by the researcher to inspect the findings of the study. After cross-checking the results from part of the study with the others, two themes were found. The themes included the uses for animal-assisted therapy and their results. The uses for animal-assisted therapy included assistance with the special education department, assistance with the reading program, help with students with emotional needs, and support for children with mental health concerns.

Results from the study revealed that animal-assisted therapy proved to be successful within the southwest Missouri district. The principal and counselor at the elementary school only reported positive outcomes of Braxton's assistance in their school. They both mentioned in their interviews that the most positive result of Braxton's presence is her ability to calm students down. It was mentioned in both interviews that children react positively to the unconditional love Braxton is able to provide as a nonjudgmental being. In fact, the counselor, Ms. Black, made the following comment in her interview: "We want kids to know that there is a dog shat shows them unconditional love. That's love that they may not get other places outside of school."

Not only did administration report a positive impact, the teachers observed a change in the school's climate as well. Thirteen teachers responded to the survey and all found Braxton as a source of encouragement for their students. Almost all of the responders mentioned that Braxton was a source of stress relief for the teachers, too.

To address the second research question, the researcher made the following observations while observing Braxton in action at the elementary school. The students are very excited to interact with Braxton; certain rules are in place so she can remain a service to all. For instance, Braxton is not allowed in the lunchroom, students may not stop the flow of traffic in the hallway to greet Braxton, and hand sanitizer must be used by all when Braxton visits a classroom. Besides being used during reading time as a support in the special education room and as a counseling tool, Braxton is used as an incentive. To elaborate, students that are recognized as student of the month are rewarded with floor time with Braxton.

Besides the observable academic supports Braxton is able to supply, she is also a mascot for healthy lifestyles and a promoter of showing a calm body. During the elementary school's drug-free week book mark and buttons are distributed to students displaying a picture of Braxton and the reasons Braxton chooses to be drug-free. The school is even able to use Braxton's image for fundraising due to her popularity with the student population. In 2013, the district sold t-shirts sporting the phrase "Braxton is my BFF" and raised significant funds for the school.

Braxton is not only a poster child for healthy living, she also helps students calm down and work through their emotions. Braxton is often used in the special education room to assist students that are having emotional breakdowns. Ms. Black explained in her interview that Braxton usually approaches the student and they sit together on the floor quietly before the student is coached through processing their emotions with an adult. Braxton is drawn to students that are upset and angry. She often approaches students in the office that were sent down due to behavior concerns. After she is able to sit with them and be calm, the students are more likely to

process effectively with the principal or counselor. Neither the counselor nor the principal were able to state a time that they were unable to use Braxton with an upset student.

Comartin, Adams, and Vega (2018) organized a study to view the opinions of 23 educational professionals in California regarding the implementation of animal-assisted intervention in the public school setting. Before collecting data from the educational professionals, the researcher shared a presentation with those participating in the survey. The information in the presentation was obtained from a review of literature conducted by the researcher. It covered the history of animal-assisted interventions (AAI), defined related terms, and reviewed current research on the application of AAI.

After taking part in the presentation, participants were asked to complete an anonymous 9-question survey. The survey included questions about potential professional experience with AAI and the professionals' beliefs about how AAI could be viewed by stakeholders including school staff, students, and parents. The respondents to the study included eight school psychologists, one speech language pathologist, three occupational therapists, one principal, three school directors, one other school administrator, two general education teachers, two special education teachers, and one program specialist. Seventeen percent of the respondents were responsible for fiscal oversight of the district.

Results from the survey were mostly expected by the researcher. Thirty percent of the respondents had prior experience with animal-assisted interventions, but no respondents indicated experience with animal-assisted therapies. Approximately 74% of the respondents agreed that animal-assisted interventions would be well-received by school staff in their district. About 57% of respondents agreed that AAI would be well-received by parents and community

members of the district. When asked if AAI would provide a valuable benefit to the students in their district, none of the respondents responded with “strongly disagree” or “disagree.” Three responded with “undecided,” seven responded with “agree,” and 13 (56%) chose “strongly agree” as their answer.

Potential limitations were also included in the survey distributed to participants. The following was the seventh question asked in the survey. “Animal-Assisted Interventions in the special education setting, such as incorporating, therapy dogs into speech therapy or special day classrooms, would be _____ by the IEP process and the requirements of IDEA.”

Approximately 9% of the respondents replied with “significantly limited,” 48% answered “limited,” 17% chose “unaffected” as their answer, 26% selected “enhanced,” and nobody picked “significantly enhanced.”

The survey ended with participants answer two questions regarding the implementation for AAI. The second to last questions asked respondents if the district should consider implementing animal-assisted activities such as canine-assisted reading programs. They responded in the following ways: strongly disagree (0%), disagree, (4.5%), undecided (18%), agree (45%), and strongly agree (32%). Finally, the survey ended with a question asking if the district should implement AAI into their existing special education programs. Nobody strongly disagreed to the prompt. One person (4.5%) disagreed while 6 (26%) were undecided. Seven (30%) of the respondents replied with “agree,” and 9 (39%) of the respondents replied with “strongly agree.”

Overall, AAA and AAT do not appear to have significant resistance from school staff. In fact, most respondents said that it would be a valuable benefit to the district. Besides school

staff, community members and parents would be expected to buy in to the idea of implementing AAI in the school district. The only roadblock in implementing AAI that was identified occurred in during the IEP process for special education students. The most likely cause for this would be parents thinking that AAI would be a required therapy on their child's IEP instead of an adjunct service. The district may be unwilling to offer AAI if a legal issue like this is looming in the background. Besides the potential negative impact of the IEP process on AAI, it seems to only bring positive impact into the district.

Emotional/Behavioral/Autism

Boe (2008) conducted a single-subject research study on the effects of animal-assisted therapy on the classroom behaviors and self-esteem of a student with an emotional/behavioral disorder using an ABAB design. One 18-year-old student participated in the study. The participant attended a special education school and took part in the study for 4 weeks. He was chosen for the study because prior interventions had not been successful, and he needed to increase his self-esteem and expected classroom behaviors.

The following research questions guided the study:

1. "How does animal-assisted therapy affect the self-esteem of a student with an emotional/behavioral disorder?"
2. "How does animal-assisted therapy affect the classroom behaviors of a student with an emotional/behavioral disorder?" (Boe, 2008, p. 6).

Before beginning the intervention, the participant was scored on the Rosenberg Self-Esteem Scale, the adult version on Coopersmith Self-Esteem Inventory, and behavior tracking

sheets to create a baseline. Classroom staff collected data hourly (both structured and unstructured time) on the participant using tally sheets.

Data were collected on the research participant hourly for 4 weeks while he was at school. Once a baseline was established after the first week, AAT started on the second week. The next baseline data was collected during the third week and AAT continued again on the fourth week. The participant interacted with the therapy dog for 1 hour per day. He walked, groomed, played, and pet the dog. Data were collected on Friday of every week. The participant completed the Rosenberg scale and the Coopersmith inventory. Staff kept a frequency tally of the subject's impolite behavior, off-task behavior and noncompliance.

Results from both self-esteem scales showed an increased score from the first to the fourth week. During the first 2 weeks the participant scored 28 points on the Rosenberg Scale and 30 points during the last 2 weeks of the study. The Rosenberg scale has a range of 10-40 does not provide names for ranges of scores such as "high self-esteem" or "low self-esteem." Overall the participant increased two points (5%) over the course of the study.

The second self-esteem inventory showed an increase as well. The participant scored a 32 on the first 2 weeks, increased to 33 in the third week, and finally scored a 35 in the last week. In qualitative terms the participant increased from significantly below average (when compared to other males his age) to somewhat below average.

Quantitative behavior data from the behavior tracking sheets was categorized in areas of impolite behavior, off-task behavior and non-compliance. Daily scores were compiled in each of the target behavior areas during the 4 weeks. Impolite behavior, off-task behavior and noncompliance all decreased in treatment weeks 2 and 4. Impolite behavior decreased by 16% at

the end of the first treatment week and 23% by the end of the second treatment week. Off-task behavior decreased by 57% after the first week of AAT and 52% after the second treatment week. Noncompliance decreased by 31% at the end of the first therapy week and 58% by the end of the second therapy week.

Overall, there were three conclusions made from this study. First, a student identified with an emotional/behavioral disorder can improve self-esteem when animal-assisted therapy is included in his daily program. The occurrences of impolite, off-task, and noncompliant behaviors decrease when AAT is used in the daily program of a student identified with an emotional/behavioral disorder. Finally, attendance increases when animal-assisted therapy is included in the daily program because the student looks forward to working with the animal.

Rosenburg (2016) conducted a qualitative observation study to determine if animal-assisted therapy will benefit students diagnosed with autism in the art classroom. The researcher used a participant observer approach since she is the teacher in the classroom. Data were gathered by interviewing other teachers and paraprofessionals that worked with the student. Also, the researcher gathered data from student questionnaires, observations of video recordings, and notes written in a field journal.

The research for this study was conducted in a mainstream art classroom consisting of 18 high school students, two paraprofessionals, and one classroom teacher. The subjects of the study included three students with ASD with varying functioning. Two of the subjects had moderate to severe ASD and were in the autism support classroom. The other subject had high functioning ASD and was fully included in the high school setting.

This study used a trained autism service dog named Pax. He was trained by the United Disabilities Services in Lancaster, Pennsylvania, for the use of the researcher's son. He was initially placed with the researcher's son to aid with sensory overload in public situations. It was because of the success the researcher's son had with the service dog that she decided to bring him into the classroom to support others with ASD. The students in the classroom were familiar with the dog from the beginning of the school year. Pax started visiting every Friday which increased to every day during the course of the study.

A 3-prong approach was used to implement the study. The first prong included introducing the presence of Pax with the researcher every day. The researcher conducted an interview with the students to receive comments about how the students feel with the dog in the room every day. A questionnaire was sent home to parents to ask about the subject's history and comfort level with dogs. The second prong included specifically designed lessons that included Pax interacting with the students on the autism spectrum and the neuro-typical students. The final prong of the study consisted of the class producing individual projects based on an interaction with Pax. The projects included paintings of Pax based on real life drawings. Video recordings, field journals, and artifacts were used to collect data during the third part of the study.

Before the study began, the researcher sent out a survey to assess the students' comfort level with dogs. One of the participants reported that he was scared of dogs while the other two said they loved dogs. The researcher took care to monitor the dog closely so Pax would not make the participant uncomfortable. About half way through the study the participant whom was scared of dogs requested to pet Pax and had a positive experience. The two participants that

enjoyed Pax's presence were excited for him to be in their classroom and they wanted to include him in their artwork.

Throughout the study, the communication between the participants and their general education peers increased. The conversations mostly included talking about Pax or were about a different topic in the presence of Pax. For instance, one participant and a general education peer discussed the colors they chose for their projects while they were both petting Pax. The researcher nor the participant's para had ever witnessed an unprompted interaction like that. Not only were the participants more likely to initiate a conversation with their peers, the peers were more likely to start a casual conversation with the participants, too.

Besides an increase in communication skills, the researcher noted academic progress in while Pax was present in class, especially during the third prong of the study. Her notes summarized that each of the participants' work was less rushed, included more detail, and took multiple class hours to complete. The participants' drew Pax as an assignment to increase artistic skill and the instructor used their interest in Pax as a motivating tool.

When Pax was a part of the art class, the participants increased their communication and artistic skills. Pax was not able to join the class on two days throughout the study. His absence was noticed immediately by the participants. Even the participant who was scared of dogs to begin verbally showed disapproval when he realized Pax was not present. The researcher wrote in her field notes: "Pax did not come today. MP had a terrible day. I gave him the task of "drawing with tape." He refused to do it. He sat the entire period and stared at the wall and did not speak to anyone" (Rosenburg, 2016, p. 24). This shows that the reliance on the therapy animal can have adverse effects when the animal is absent.

Overall, with animal-assisted therapy, the participants showed an increased ability to communicate with their general education peers, increased their art skills, and reported the classroom felt “warm” and “nice.” When Pax was not able to join class, the participants showed a decrease in participation and communication.

Reading

Kaymen (2005) conducted a small-scale qualitative study to observe the impact of canine animal-assisted therapy in the instruction of struggling readers. The study was conducted at an elementary school in California. Four third-grade students struggling with reading participated in the study. Sessions were conducted at the elementary school during the SHARE a Book program in a reading, skills pull-out classroom. Participants read aloud to a dog provided by the program which, in this case, was a black standard poodle.

The SHARE a Book program was create for two main reasons. First, to encourage struggling readers to read more often than they had previously. Research supports reading often increases both reading fluency and comprehension. Second, the creators of the program hoped to instill more confidence in the participants that they did not have toward reading before.

Prior to conducting the study, the researcher assumed there would be a couple of negative impacts on the participants. First, she believed the participants would be distracted by the furry companions and not focus on the reading at all. Second, she thought some participants may be leery of the animal and not want to approach it at all.

During the program, the participants sat on the floor with the dog sitting next to them or at their feet. The children were allowed to touch the dog while reading to it. As the students

read to the dog it would often fall asleep or relax quietly near the student. The students read to the dog about 20 minutes at a time.

Objective and reflective field notes provided the bulk of the data used in this study. Interviews of the participants and teaching aides were also added. The interviews included open-ended questions so the participants could speak freely about the therapy. Finally, questionnaires were sent home to the families of the participants to create a comprehensive view of the program. The questionnaire gathered information about the thoughts and impressions the family had toward the reading interventions and their reasons for feeling that way.

Results from the study showed three major findings. First, the participants enjoyed reading aloud to the program dog. When they were asked how they felt when they read to the canine students commented with positive answers including: “happy,” “really happy,” “really great,” “really excited,” and “good because it was fun.”

As mentioned earlier, it was assumed that the students would be distracted while participating in animal-assisted therapy sessions. However, the opposite was true. The researcher observed the students were at ease and continuously reading during their time with the therapy dog. The students showed that they were distracted only when others entered the room or if another student was talking loudly in the room. Explanations from the literacy assistants confirmed the observations of the researcher. When asked about the participants staying on task, one of the literacy assistants responded with:

... I would think that (the students) might even be distracted by another dog or something... They just are so focused. They are just reading these books with the dogs and, you know, sometimes they’ll be petting the dog as they’re reading... or the dog will

just be lying there sleeping, and the just continue reading on and on. Once in a while they'll show a dog a picture or something. It's so cute! (Kaymen, 2005, p. 17)

The observations of the participants interacting with the dog and the interviews with the literacy assistants reveal that the students were on task and focused on reading instead of being distracted.

Benefits from animal-assisted therapy through the SHARE a Book program reached farther than the resource reading room. Parents of the participants reported only positive results in their children. Although parents could not report a direct increase in their child's reading ability, each family reported that their child enjoyed participating in the program.

Griess (2010) published a study analyzing the effect of animal-assisted therapy on the reading progress of students identified with learning disabilities. The researcher used a reversal replication, single case design to determine the effect of reading aloud to a therapy dog on the students' reading progress as measured by total amount of time read. The following research questions drove the study. "Does canine animal-assisted therapy affect reading progress among students identified as having learning disabilities?" and "What are the perceptions of students identified as having a learning disability regarding the use of canine animal-assisted therapy in relation to their reading progress?"

The participants of the study were students in third through fifth grade identified with moderate to severe learning disabilities and at risk for reading failure. Four students participated in the single case design. The study took place in a suburban public elementary school part of a large school in the southern region of the United States. The use of animal-assisted therapy was common practice in the school before the study took place.

A single-cases, A-B-A-B research design was used to analyze the effects of the therapy dog (independent variable) on the reading progress defined by amount of time spent reading (dependent variable). The study was conducted over a 13-week period from October to January. The duration of each of the phases consisted of nine 20-minute sessions over the course of 2 to 3 weeks.

During the baseline phase, participants read aloud to an adult. Then, for the first intervention phase, the participants read aloud to the dog. Next, the withdrawal phase consisted of the participants reading aloud to an adult. Finally, the last phase ended with the participants reading aloud to the dog. The study was finalized with follow-up interviews.

The baseline phase consisted of the participant reading aloud to an adult. They were seated on the floor or in a comfortable position. The adult did not take notes but did offer assistance with a word or context if requested by the participant. Once they were done reading the adult reading partner conducted the Informal Reading Inventory (IRI) assessment with the participant.

During the intervention phase, the participants were introduced to the therapy dog and its handler. The interacted with the dog in an informal manner by talking to it and petting it. The participants were instructed to read to the dog. The handler did not interact with the student unless asked to help with a word. Observational data was collected by the researcher at 2- minute intervals. To end the session, participants complete the IRI assessment with the researcher.

The withdrawal phase consisted of the participants reading aloud to the adult reading partner again without the presence of the animal therapy dog. The researcher collected data during the session. Then, the participant completed the IRI assessment.

After the second phase intervention, the participants were interviewed individually to talk about their experiences with the AAT. The interview questions were used to gather information from the students on their interaction with the therapy dog and their opinions about reading aloud to an adult. They were asked questions such as “Tell me about reading to Beckett” and “tell me about reading with Ms. Griess.”

Descriptive statistics were used to analyze the results for each of the participants separately. Participant A increased their total amount of reading time. Participant A increased their duration of reading by 12 minutes from baseline to the first intervention phase. Then, the total amount of reading time dropped during the withdrawal phase and increased again for the second intervention phase. The total reading time for Participant A during the final intervention was 14.67 minutes.

Participant B showed a similar pattern to Participant A’s total reading time during each phase. During the first phase, Participant B’s mean reading time was 12.22 minutes. This number jumped to a mean of 17.56 minutes during the first intervention phase. The mean decreased again during the withdrawal phase to 7.78 minutes and increased again to 14.11 minutes during the second intervention phase. This indicated a significant increase of total reading time during the intervention phases.

The pattern continued in the case of Participant C. During the first phase reading to an adult, the participant’s mean reading time was 13.89 minutes which increased to 17.33 minutes

during the first intervention phase. Then, the total reading duration mean decreased to 14.11 minutes during the withdrawal phase. As with the first two participants, the mean reading time increased. In this case, it jumped up to 16.33 minutes.

Results from the participant responses to the IRI assessment showed some common themes. All of the participants stated in their own words that they had increased motivation and enjoyment when reading with Beckett. They also shared that they had positive feelings when they were able to read to Beckett and they had an emotional bond with him. When asked about reading to the research the student was “normal” and “sort of boring.” Two of the participants mentioned that they chose more difficult books to read to Beckett because then they could read more and spend more time with him.

Overall, the researcher found that the participants read for 4.04 more minutes in the presence Breckett, on average. Motivation to read and the emotional connection with Breckett seemed to be the most positive comments the participants stated about their experience with animal-assisted therapy. The finding support the effects of animal-assisted therapy on reading progress among students identified with a learning disability.

Smith (2010) conducted a quantitative experimental pre/posttest control group study to measure the impact of animal-assisted therapy during reading instruction on the reading performance of homeschooled students. Twenty-six third grade homeschool students were included as participants. AAT instruction was provided 1 time per week one on one with the participants. Pre- and post-test results were compared to measure the effectiveness of animal-assisted therapy. Gain scores were used to measure progress instead of grade scores.

To start, a pretest was given to an experimental group and a control group of participants. The experimental group received the treatment of 6 weekly 30-minute one-on-one reading sessions with the therapy dog. The control group did not receive AAT, but they did read one on one with an adult for 30 minutes every week for 6 weeks similar to the experimental group. All of the sessions took place at a local library in order to keep the setting controlled and to serve as a familiar space for the participants.

During the AAT sessions, participants were seated next to the service dog and on the other side of the dog sat the handler. Parents were allowed to observe from a distance but were not permitted to interrupt the therapy session. During the first 3 minutes of the session the handler spent time simply interacting with the dog and the student. Then, the participant spent the next 30 minutes reading from a self-selected book from a selection of pre-approved books out loud to the animal.

Descriptive statistics were used to find the mean and standard deviation of the data. Then, the overall reading quotients (ORQs) were compared between the two groups. The ORQ is a combination measure of a student's reading fluency ability and reading comprehension ability. Finally, a mean comparison was completed to discern if there was a statistically significant difference in the area of reading rate or ORQ. The comparison was completed by using a two-tailed t-test.

Results from the study rejected the null hypothesis that reading performance as measured by reading rate of the experimental group receiving AAT reading instruction will be statistically equivalent as the reading rate of third grade homeschooled students not receiving AAT reading instruction. In the area of ORQ, the null hypothesis that stated the reading performance as

measured by ORQ of the experimental group receiving AAT reading instruction will be statistically equivalent as the ORQ of third grade homeschooled students not receiving AAT reading instruction, was not rejected.

While the experimental group did not achieve a gain score greater than 9 in the area of ORQ, the group did gain a score of 6.69. This was higher than the control group, but not enough to be statistically significant. In all areas assessed, the experimental group gained a higher score than the control group including ORQ and reading rate.

Well-Being of Service Animal

Haubenhofner and Kirchengast (2007) completed a study in which they measured the cortisol levels of handlers and companion dogs to measure their stress levels related to participating in animal-assisted therapy sessions. The study participants consisted of 13 handler and eight companion dogs. The dogs between 2 and 9 years old of varying breeds.

This study limited the settings of animal-assisted therapy to elementary schools, hospitals, rehabilitation centers, and assisted living homes. The therapy dogs went along with their handlers to form an animal-assisted therapy team. The handlers consisted of teachers, physiotherapists, and social workers. All teams completed 9 to 50 therapeutic sessions during the sampling period of the study.

The study began with a questionnaire for the handlers to complete. It included monotonous questions about their day to day animal-assisted therapy sessions, but also included questions about their emotions related to the therapy work. The handlers also answered questions about the emotions their canine counterparts. The handlers were trained on how to properly collect saliva samples from themselves and their dogs. Then, they were responsible for

doing so throughout the research study. The handlers collected samples three times per day in the morning, afternoon, and evening for 3 control days. Control days indicated that they were not participating in any sort of animal-assisted therapy during the day.

Once the control group was formed, the handlers collected samples 3 times per day for 3 months. Instead of collecting saliva samples in the morning, afternoon, and evening the handlers collected samples right before and after a therapeutic session while the team was still at the session location. The handler then put the sample on ice and kept them in their household freezer.

The results from the study highlighted the cortisol levels of the dog handlers and the dogs themselves. High cortisol levels in the measured saliva equates to a higher stress level. Both the handlers and the dogs showed lower cortisol levels on the control days compared to the therapy days. Dog handlers showed significantly higher cortisol concentrations before therapeutic sessions than after. The dogs showed insignificantly lower cortisol concentration before therapeutic sessions than after. Cortisol secretions in the dogs increased with the number of therapy sessions they completed. Dogs that participated in 25 sessions over 3 months (or two sessions per week) showed cortisol levels that increased steadily.

Some key conclusions are come from this study. First, therapy dogs need adequate breaks between therapy sessions for relaxation and recreation. Second, dogs participating in therapeutic sessions should do two times per week or less in order to keep their cortisol levels in a healthy range.

Summary

Throughout Chapter 2, I reviewed eight studies that researched the effects of canine animal-assisted therapy in an educational setting. Each study found advantages to implementing AAT with students receiving special education services for autism, emotional/behavioral disorders, and learning disabilities in reading. Animal assisted activities and interventions were also used positively in the general education school setting in various ways.

Table 1

Summary of Chapter 2 Findings

AUTHOR	DESIGN	PARTICIPANTS	PROCEDURES	FINDINGS
Boe (2008)	Single- subject ABAB	18- year- old male with emotional/behavioral disorder	Subject received animal-assisted therapy (one hour per day for one week) during both treatment phases. Quantitative data collected with self – esteem evaluations and classroom behavior tracking sheets.	Self-esteem and attendance improved. Occurrences of impolite, off task and non-compliant behaviors decreased.
Comartin, Adams, & Vega (2018)	Qualitative surveys	Twenty-three educational professionals in a district in California	PowerPoint presentation of animal-assisted therapy shared and data collected via surveys regarding opinions of possibly implementing AAI in their district.	Overall, most agreed that there could be multiple uses for AAI in their district, but red tape, especially in the IEP process could make it difficult to implement.
Griess (2010)	Reversal replication, single case ABAB design	Three students identified as having a learning disability in reading and at risk.	First phase participants read aloud to an adult. Second phase included the participants reading aloud the canine AAI animal. The third phase included withdrawal from AAI and participants read only to the researcher. The finally phase reintroduced the dog.	Statistically significant increase in total amount of reading time in presence of therapy dog. Participants provided positive feedback about the experience.

Table 1 (continued)

AUTHOR	DESIGN	PARTICIPANTS	PROCEDURES	FINDINGS
Haubehofer & Kirchengast (2007)	Questionnaire and data analysis	Thirteen handlers and 18 companion dogs of various breeds	Questionnaires completed on emotions of handlers and dogs prior to and after therapy sessions. Saliva collected from handlers and canines before and after therapy sessions. Cortisol levels were then compared.	Handlers and dogs had increased cortisol levels on therapy days compared to control days. Handler cortisol levels increased with session duration while dog cortisol levels increased with number of sessions completed per week.
Kaymen (2005)	Qualitative observation	Four third grade students with reading deficits; one female and three males.	Intervention included reading aloud to a trained therapy dog independently in a classroom setting.	Participants were more apt to practice reading aloud and found the dogs to be fun and exciting. None of the participants were distracted by the dog as was expected by the researcher.
Rosenburg (2016)	Qualitative observation, field notes, surveys, student artifacts and informal interviews	Four students in special education. Two diagnosed with moderate autism, one diagnosed with high functioning autism and one diagnosed with Coffin-Lowery Syndrome	Baseline survey, intervention, concluding survey	Introduction of therapy dog increased social confidence and artistic skill level of all participants.
Smith (2010)	Quantitative experimental pre/post-test control group	Twenty-six third-grade students in a home school setting split into two research groups.	One on one therapeutic reading instruction with trained AAT dog one time per week. Each session included monitored reading of grade level books.	Two-tailed two sample t-test score of $t(24) = 2.56$, $p = .017$ confirmed that AAT oral reading instruction significantly impacted student reading rate.

Table 1 (continued)

AUTHOR	DESIGN	PARTICIPANTS	PROCEDURES	FINDINGS
Tate (2014)	Mixed methods design used to gather qualitative and quantitative data on viewpoints of teachers and administrators involved with AAT	Administration and entire population of students in the school district were observed for the study.	Interviews were completed with administration team and observation of Braxton's interaction with the student population were noted.	AAT used successfully in the special education department, assistance with the reading program, help with students with emotional needs, and support for children with mental health concerns.

Chapter 3: Conclusions and Recommendations

Conclusions

Animal-assisted therapy is used in many different ways within the educational system. The implementation of AAT is not a common and widely used intervention. Even so, research proves that it is beneficial and effective in most cases. The purpose of this starred paper was to examine the advantages and disadvantages of AAT in the educational setting. Chapter 1 explained the background of AAT and the importance of implementing it within the special education population. Chapter 2 summarized the finding of eight research studies that explained the effectiveness of AAT. In this chapter, I discuss the conclusions I made based on the studies I examined and my recommendations for future research.

Each of the eight studies I examined determined that canine AAT showed improvements in the measured skill. The measured skills included behavior regulation, communication, and reading rate. All of the studies demonstrated benefits for using AAT and that AAT can be a useful tool to educators if used properly. Many of the studies demonstrated observation design due to the organic nature of AAT.

Two studies examined how AAT could be used as a multi-purpose tool within the school district (Comartin et al., 2018; Tate, 2014). AAT influenced participants positively with reading fluency, behavior regulation, emotional support and even as a mascot for healthy living (Tate, 2014). Although staff could name some negative aspects of implementing AAT in their district, the positives outweighed the negatives (Comartin et al., 2018).

Two studies explained how AAT was used with students with special education students receiving services for emotional/behavioral disorders and autism spectrum disorder (Boe, 2008;

Rosenburg, 2016). The participant with an identified emotional/ behavioral disorder showed an increase in on task behavior and self-esteem when AAT was a part of his school day (Boe, 2008). Four students receiving services for autism spectrum disorders increased their ability to associate with their general education peer during art class when the AAT dog was present in their classroom for weeks. Not to mention, their art skills increased as well due to their increased interest in the service animal (Rosenburg, 2016).

Three studies clearly showed the positive impact of AAT on reading ability of student at risk of or identified with a learning disability in the area of reading (Griess, 2010; Kaymen, 2015; Smith, 2010). Struggling readers showed an observable increase of reading fluency and enjoyment for reading while taking part in an AAT program at their school (Griess, 2010; Kaymen, 2005). Home schooled students also found value in AAT at a local library. ATT resulted in a statistically significant increase in their reading rate (Smith, 2010).

The last study stood as a cautionary tale to those considering using AAT as an intervention (Smith, 2010). The study showed that while cortisol levels in handler increase steadily with each therapy session, cortisol concentrations in their canine counterparts increase with the number of sessions done per week. Based on the results of the study, the researchers recommended that AAT dogs get adequate breaks for rest and recreation. Canine cortisol levels steadily increased when required to work more than two times per week (Smith, 2010).

Recommendations for Future Research

Throughout my analysis of the advantages and disadvantages of AAT in the educational setting, most of the studies I found provided data that showed the benefits of using AAT with students. The studies were limited to few participants and in one case just one participant. Much

of the research was conducted in controlled environments with limited interactions outside of the AAT session and in limited settings. Most of the studies were conducted in a classroom or a section of a library.

Future research should include larger groups of participants. Since disabilities categories can range drastically, it would be beneficial to compare a larger group of participants to one another to determine the effects of AAT in the educational setting. Extending future research to include a high number of participants could also lead to determine long-term effects after initial implementation.

Future research should examine the toll AAT takes on the participating animal. The majority of the studies were limited to looking at the effects of AAT on the students taking part in the intervention. Not to mention, most of the studies were conducted over a matter of weeks while a service animal works year round.

Much of the research found was based on qualitative data such as observations and interviews. While this is valuable information to supplement hard facts, quantitative data is necessary for AAT to become a widely used resource. All of the research points to the positive implications of AAT, there just needs to be more quantitative data. This would also help create a streamlined process for AAT professionals and those aspiring to be AAT professionals implement the intervention in the future.

Implications for Practice

It is essential for educators to implement interventions that are evidence-based and proven to benefit students. Through my research, I was excited to see that AAT through the use of therapy dogs shows benefits to students with a variety of needs. Although it is not widely

used in the educational world yet, it is nice to know that more positive interventions are being discovered and utilized. I hope to eventually use AAT in my classroom as a support to my students in the areas of emotional/ behavioral regulation, social skills, and reading fluency.

To continue my research on AAT, I would like to examine the process of implementing AAT in the public school setting. The process seems simple, yet time consuming and intensive. I want to ensure the safety and comfort of my students. I found that there are barriers to implementing AAT such as allergies, cultural beliefs, and logistics. Therefore, it would be important to examine those areas prior to considering AAT as a viable intervention option in my classroom.

Summary

Many students receive many different interventions for emotional/behavioral regulation, social skills, and reading skills. AAT is an intervention that has been used successfully in the educational setting. It has been used by administrators, teachers, and therapists to support students working towards a variety of goals. While there are many positives that come from AAT, care must be taken to implement AAT successfully. When done correctly and progress is monitored, AAT can be a viable option for educators looking for a resource to benefit their students in many different ways.

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