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UNIVERSITY OF NORTHERN COLORADO

Greeley, Colorado

The Graduate School

THE EFFECTS OF ANIMAL ASSISTED THERAPY ON  
TANTRUMS AND AGGRESSIVE BEHAVIORS  
OF CHILDREN WITH AUTISM

A Dissertation Submitted in Partial Fulfillment  
of the Requirements of the Degree of  
Doctor of Philosophy

Rebecca L. Jesionowicz

College of Education and Behavioral Sciences  
Applied Psychology and Counselor Education  
School Psychology

May 2015

This Dissertation by: Rebecca L. Jesionowicz

Entitled: *The Effects of Animal Assisted Therapy on Tantrums and Aggressive Behaviors of Children with Autism*

has been approved as meeting the requirement for the Degree of Doctor of Philosophy in  
College of Education and Behavioral Sciences in School of Applied Psychology and  
Counselor Education, Program of School Psychology

Accepted by the Doctoral Committee

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Accepted by the Graduate School

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## ABSTRACT

Jesionowicz, Rebecca L. *The Effects of Animal Assisted Therapy on Tantrums and Aggressive Behaviors of children with Autism*. Published Doctor of Philosophy dissertation, University of Northern Colorado, 2015.

This study investigated the influence of Animal Assisted Therapy on three elementary school boys' with Autism Spectrum Disorder emotional regulation. The children participated in 12 Animal Assisted Therapy sessions using the Mutt-i-grees Curriculum with a therapy dog over the course of 6-8 weeks. A non-concurrent multiple-baseline-across-participants design was used to examine how the intervention affected the frequency, intensity, and duration of tantrums and the frequency and intensity of aggressive behaviors. Tantrums and aggressive behaviors were used as indicators of emotional dysregulation. There was minimal evidence that indicated that Animal Assisted Therapy might decrease the duration of tantrum behaviors and the intensity of aggressive behaviors. Overall, the results did not suggest that Animal Assisted Therapy had a positive effect on the participants' temper tantrums and aggressive behaviors.

Keywords: autism spectrum disorder, animal assisted therapy, emotional regulation, tantrums, aggression.

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## **CHAPTER I**

### **INTRODUCTION**

This chapter outlines the introduction for this study. An overview of Autism Spectrum Disorders, emotional regulation, and Animal Assisted Therapy are provided. Additionally, the statement of the problem, rationale, statement of the purpose, research questions, limitations, and definitions of terms are addressed in this chapter.

#### **General Statement**

Autism Spectrum Disorders (ASDs) are complex neurodevelopmental disorders that are characterized by three core features: deficits in communication, reciprocal social interaction, and restricted repetitive behaviors or interest (Faras, Ateeqi, & Tidmarsh, 2010). In 1943, Kanner was the first to use the term “autism” to describe children with behavior consistent with this triad of impairment (Gotham, Bishop, & Lord, 2011). Since then, impairments in social interaction, communication, and restricted/repetitive behavior have remained the core symptoms of Autism Spectrum Disorder in the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-V; American Psychiatric Association [APA], 2013). These deficits used to be the core symptoms of a group of disorders referred to as Pervasive Developmental Disorders in the *Diagnostic Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (DSM-IV-TR; American Psychiatric Association [APA], 2000). Before the DSM-V, Autism Spectrum Disorders used to describe three of the five Pervasive Developmental Disorders in the DSM-IV-TR

(APA, 2000): autistic disorder, Asperger's disorder, and pervasive developmental disorder-not otherwise specified (PDD-NOS).

In the DSM-IV-TR, Autistic disorder, or what was often referred to as classic autism, was characterized by symptoms across the domains of social interaction, communication, and restricted repetitive and stereotyped patterns of behaviors. In order to give a diagnosis of autistic disorder, the person must have met a total of six characteristics with two being from the social interaction domain and one from each of the other domains (APA, 2000). In addition to these diagnostic characteristics, many individuals with autism have cognitive impairments and almost all individuals with autism have a language delay (Lord, Cook, Leventhal, & Amaral, 2000). Asperger's disorder was also characterized by impairments in social interaction and restricted repetitive and stereotyped patterns of behavior. However, individuals with Asperger's disorder did not have cognitive impairments or speech delays (Lord et al., 2000). Rather, communication abnormalities (i.e., difficulty with pragmatics, non-verbal communication, prosody) were often present (Gotham et al., 2011). High functioning autism used to be used interchangeably with Asperger's disorder. In the DSM-IV-TR, Pervasive Developmental Disorder Not Otherwise Specified was diagnosed when the onset criteria for autistic disorder had not been met or when the patterns of impairments fell short of the required number of symptoms (Gotham et al., 2011).

In the DSM-V, ASD replaced the Pervasive Developmental Disorders category as an umbrella term that combines Autistic Disorder, Asperger's Disorder, and Pervasive Developmental Disorder-Not Otherwise Specified (Lohr & Le, 2012). Instead of separate diagnostic categories, practitioners use one term to diagnosis patients with

autism. In the DSM-V, the core diagnostic symptoms of autism (i.e., deficits in communication, social interaction, and restricted repetitive behaviors or interest) remained. However, deficits in communication and social interaction were categorized under one domain (Lohr & Le, 2012). Factor analyses of the Autism Diagnostic Observation Schedule (ADOS; Gotham, 2008) and the Autism Diagnostic Interview-Revised (ADI-R; Lord, Rutter, & Couteur, 1994) showed that items under these domains load highly onto a single factor. This indicated that the overlap between communication and social interaction has been too significant for them to be individual domains. Therefore, they were combined into one domain in the DSM-V (Lohr & Le, 2012).

The symptoms of ASD manifest in the first few years of life and last a lifetime. Autism Spectrum Disorder has affected more boys than girls with a ratio of 4:1 (Grandin, Fine, & Bowers, 2010). There has been a significant increase in the rates of ASD diagnoses over the past few decades. Approximately 40 years ago, the rates of ASD were 1 in 2,500 children born. In 2012, the Center for Disease Control and Prevention reported that new estimates of children with ASD in the United States has been 1 in 88 overall; and rates of 1 in 54 boys (Burdette, 2012). Some of the increase in those diagnosed with an ASD could be accounted for by wider screening and better diagnosis; however, there has been a lack of consensus among researchers and practitioners on how much of the increase can be accounted for by this (Bauman, 2011; Center for Disease Control and Prevention, 2012; Thurm & Swedo, 2012). While the etiology of ASD has been unknown, there has been a belief that a strong genetic base has existed (Bauman, 2011; Levy, Mandell, & Schultz, 2009; Sundberg, 2004; Thurm & Swedo, 2012).

Researchers continue to study the risk factors and cause to gain a better understanding of ASD and the increase in rates we have seen over the last decades.

Autism is a spectrum disorder because the presentations of the core deficits are highly variable. Some persons diagnosed with ASD could be profoundly impacted, while others could be superior in some areas of functioning. For example, deficits in communication could range from having slight abnormalities in speech (i.e., flat intonation, pedantic speech) to having no speech at all (Levy et al., 2009).

Communication deficits could include a delay in verbal language, lack of non-verbal communication (e.g., gestures), impairments in pragmatics, and stereotyped, repetitive, or idiosyncratic language (Levy et al., 2009). Similarly, deficits in reciprocal social interaction could present anywhere from having an abnormal social approach to a total lack of initiating social interactions. Deficits in socialization could include a lack of peer interaction, an absence of seeking to share enjoyment, an impairment in social reciprocity, and difficulties with social judgment (Levy et al., 2009). Restricted repetitive behaviors or interest could range from having a passionate, inflexible interest in a specific subject to self-destructive behaviors, such as head banging. Restricted, stereotyped, and repetitive patterns of behaviors have included a preoccupation with an interest, a strict adherence to routines, repetitive motor mannerisms, self-stimulatory behaviors, and a preoccupation with parts of an object (Levy et al., 2009).

### **Emotional Regulation in Children with Autism Spectrum Disorder**

Although this triad of impairment has represented the main deficits of ASD, children diagnosed with ASD often have had difficulties in other areas such as sensory integration (Ben-Sasson et al., 2009), emotional regulation (Garon et al. 2009; Rieffe et

al. 2011), and executive functioning (Geurts, Verte, Oosterlaan, Roeyers, & Sergeant, 2004; Hughes, Russell, & Robbins, 1994; Ozonoff & Jensen, 1999). Emotional regulation is the ability to appropriately monitor, evaluate, and modify the intensity and timing of positive and negative emotional reactions to specific stimuli to fit the situation. In contrast, an inability to regulate emotions has often been termed emotional dysregulation (Macklem, 2008). Keenan (2000) defined emotional dysregulation as the “inability to respond to stimuli with well-maintained control” (p. 420). Emotional regulation significantly impacts a person’s ability to engage in satisfying relationships and extended interactions, cope with changes in routines, and participate in social activities (Laurent & Rubin, 2004). Additionally, individuals who regulate their emotions are “better able to maintain social engagement, to attend to salient aspects of the social environment, to solve problem, and to communicate effectively” (Laurent & Rubin, 2004, p. 287).

Confirming the fact that children with ASD struggle with emotional regulation, Rieffe et al. (2011) found that parents of children with ASD reported more emotional problems in their children than parents in a control group. Additionally, Garon et al. (2009) reported that infants who were later diagnosed with ASD had a lower positive affect and poorer regulation of negative emotions when compared to a control group. In a retrospective study, Gomez and Baird (2005) found that parents of children with ASD reported that their children had significantly more difficulties with self-regulation than a comparison group. Furthermore, Konstantareas and Stewart (2006) found that children with ASD used less effective emotion regulation strategies than a control group.



Symptoms of emotional dysregulation are often exacerbated in children with ASD and often lead to externalizing behaviors, such as, tantrums, repetitive behaviors, aggression, and self-injury (Mazefsky, Pelphrey, & Dahl, 2012). Several studies have shown that emotional dysregulation was associated with aggression (Cohn, Jakupcak, Seibert, Hildebrandt, & Zeichner, 2010; Izard et al., 2008; Sullivan, Helms, Kliewer & Goodman, 2010; Tager, Good, & Brammer, 2010) and tantrums (Giesbrecht, 2008). Vitiello and Stoff (1997) defined aggression as “a behavior deliberately aimed at inflicting physical damage to persons or property” (p. 307). Although there were several subtypes of aggression, this study was only interested in physical and verbal aggression. Examples of these behaviors included, but were not limited to, hitting, kicking, head banging, and breaking objects. Similar to aggression, tantrums were defined as “brief but intense emotional episodes that are characterized by explosive, impulsive, out-of-control, whole body displays of anger” (Giesbrecht, 2008, p. 27). Crying, whining, screaming, throwing self on floor, and stomping feet were all examples of tantrum behaviors. Definitions of these behaviors were similar in the autism literature.

Tantrums and aggressive behaviors have been shown to be common externalizing behaviors seen in children with ASD. Additionally, these types of behavioral outbursts have often been co-occurring behaviors in children who have ASD. In a sample of 777 children with autism, tantrums, and aggression were present in more than 90% of the total sample (Mayes & Calhoun, 2011). Dominick, Davis, Lainhart, Tager-Flusberg, and Folstein (2007) found that 70% of children with ASD had experienced a period of severe tantrums, 60% of these occurred on a daily basis and were constant. They also found that 38% of children with ASD displayed aggressive behavior and that aggression, self-injury,

and tantrums were significantly associated with each other. Additionally, Kanne and Mazurek (2011) found that, in a sample of 1,380 children and adolescents with ASD, parents reported that 68% had demonstrated aggression to a caregiver and 49% to non-caregivers.

Emotional dysregulation and the associated challenging behaviors have often been linked to negative outcomes. For example, these deficits could exacerbate the core symptoms of ASD (i.e., deficits in communication, socialization, and restricted repetitive behaviors) and decrease the likelihood of typical peer interactions that are needed to practice social skills. Additionally, there was a correlation between children with ASD who exhibited atypical behaviors (e.g., aggression and tantrums) and lower non-verbal IQs, lower levels of expressive language, more severe social deficits, and more repetitive behaviors (Dominick et al., 2007). Also, there was a correlation between anger in children and bullying and victimization of bullying (Rieffe, Camodeca, Pouw, Lange, & Stockmann, 2012).

In children with developmental disabilities, aggression was a strong predictor of crisis intervention re-referrals (Shoham-Vardi et al., 1996) and admission and readmission to residential facilities (Lakin, 1983). Additionally, behavior problems of young adults with an intellectual disability, including autism, were a strong predictor of out of home placement (McIntyre, Blacher, & Baker, 2002). “In children with ASD, who are already vulnerable to such difficulties, it is possible that inadequate emotion regulation may moderate developmental trajectories, exacerbate negative outcomes, and even interfere with children’s response to intervention” (Jahromi, Meek, &

Ober-Reynolds, 2012, p. 1250). Therefore, interventions that focus on emotional regulation are important in the treatment of ASD.

## **Interventions**

Due to the variability of symptoms of ASD, practitioners must individualize the interventions to meet the specific needs of each individual, leading to great variability in treatment modality. Interventions for ASD have ranged from educational to clinical to biomedical (e.g., medications and nutrition). Unfortunately, there has been no single intervention that has worked for all children with ASD. Furthermore, some intervention modalities have had a strong evidence base, while others were lacking empirical support. For example, Applied Behavior Analysis (ABA) was one of the most empirically supported interventions and has been used in the treatment of children with ASD for more than 45 years (Axelrod, McElrath, & Wine, 2012; Jensen & Sinclair, 2002; Leader, Healy, & O'Conner, 2009). Lovaas was the first to publish a study that demonstrated the effectiveness of ABA with individuals with ASD (Axelrod et al., 2012; Lovaas, 1987). Since the beginning work of Lovaas, ABA has proved to be an effective intervention for improving social, communication, and repetitive behavior deficits in children with ASD. However, these improvements have been difficult to generalize. Other interventions modalities such as gluten-casein free diets (Cornish, 2002), sensory integration (Lang et al., 2012), detoxification of heavy metals (chelation; Davis et al., 2013), and hyperbaric oxygen treatment (Granpeesheh et al., 2010), have lacked evidence of their effectiveness and, in some cases, show possible negative effects. Animal Assisted Therapy (AAT) has been a growing practice of using animals to connect with children and facilitate the

intervention process. Although the literature base on Animal Assisted Therapy (AAT) has been limited, available studies on using AAT with children were promising.

### **Animal Assisted Therapy**

Animal Assisted Therapy (AAT) has been of an increasing interest to practitioners who work with children with ASD, because some individuals with autism have had stronger connections to animals than with humans. Temple Grandin, a professor of animal science, bestselling author, autism activist, consultant to the livestock industry, and an individual with autism, reported on her website and through personal communication that “many people on the ASD spectrum have an affinity for animals and really understand them” (personal communication, July 24, 2011). Although there has been little research on the relationship between individuals with ASD and animals, there has been a number of reports that children with ASD have close relationships with their pets and other animals. McNicholas and Collis (1995) conducted in-depth interviews with three mothers of children with ASD who had pets. All participants reported that their child had strong relationships with their pets and displayed behaviors towards their pets that they rarely displayed towards humans.

Pet Partners, formerly Delta Society, is an organization that certifies therapy animals in the U.S. They defined AAT as

A goal-directed intervention in which an animal that meets specific criteria is in integral part of the treatment process. AAT is directed and/or delivered by a health/human service professional with specialized expertise, and within the scope of practice of his/her profession. (Fine, 2010, p. 34).

Thus, a key component of AAT is the directed and specialized use of the animal to facilitate or enhance the therapy process and goals (e.g., behavioral, social-emotional, speech language, motor). Several types of animals could be used in AAT, including

dogs, cats, horses (i.e., Equine-Assisted Therapy and Hippotherapy), dolphins (Dolphin-Assisted Therapy), birds, reptiles and other small animals. Animal Assisted Therapy has often been used in conjunction with other therapeutic interventions. For example, Canine Assisted Play Therapy incorporates the use of a certified therapy dog with play therapy techniques.

During AAT, the client participates in activities with the animal that were individually designed to meet their specific goals. A variety of techniques may be used during AAT to incorporate the animal into the therapeutic process. Some activities that may be included in the therapy sessions have been: petting the animal, walking the animal, learning how to take care of the animal, playing games with the animal, horseback riding, and training the animal. For example, a child with goals in the areas of social interactions may take the dog on a walk and/or play fetch with the dog in a public park. Alternatively, a child with goals in reciprocal communication may play games or work with the dog on simple tricks. O'Callaghan (2008) conducted a survey on the various animal-assisted techniques that mental health professionals incorporated into their practice. The top five techniques included: (a) reflecting on the client's relationship with the animal, (b) encouraging the client to interact with the animal, (c) sharing information about the animal's family history, (d) sharing history that was related to the therapy animal, and (e) sharing animal stories and metaphors with animal themes (O'Callaghan, 2008). The variability of techniques allows for AAT to be used with a wide variety of populations and treatment modalities including individual therapy and group therapy. Furthermore, AAT could be incorporated into a wide variety of settings

including schools, hospitals, nursing homes, prisons, and private practices (Altschiller, 2011).

Research has supported the use of AAT with individuals of differing ages, abilities, and needs. For example, Dietz, Davis, and Pennings (2012) found that incorporating trained therapy dogs into therapy groups for clients between the ages of 7 and 17 who had a history of sexual abuse resulted in significant decreases in trauma symptoms such as anxiety, depression, anger, post-traumatic stress disorder, dissociation, and sexual concerns. Burger, Stetina, Turner, McElheny, and Handlos (2011) evaluated the impact of AAT for male inmates with drug addictions. During the therapy, the inmates managed the dog's health and taught the dog a variety of tasks. Those inmates participating in AAT showed significant improvement in their emotion regulation, emotional self-control, and acceptance of emotions and significantly reduced their depressive and aggressive emotions. Additionally, introducing aquariums into the rooms of patients with Alzheimer's increased the patients' nutritional intake and weight, which resulted in patients needing less nutritional supplements (Edwards & Beck, 2002).

### **Animal Assisted Therapy for Autism**

Animal Assisted Therapy has had a positive impact on the triad of impairment for children with ASD (e.g., Bass, Duchowny, & Llabre, 2009; Krskova, Talarovicova, & Olexova, 2010; Martin & Farnum, 2002; Redefers & Goodman, 1989; Sams, Fortney, & Willenbring, 2006). For example, Terrasi (2007) found that children with ASD who had very little verbal communication showed an increase in verbal responses and required fewer verbal prompts during Dolphin-Assisted Therapy. Another study found that children and adolescents across the spectrum who worked with a certified therapy dog

showed an increase in prosocial behaviors including: awareness, responsiveness, cooperation, playfulness, physical gestures, eye movement, and vocalization (Petrongelli-Halloran, 2010). Redefer and Goodman (1989) found that children with ASD and cognitive impairments decreased repetitive behaviors and increased prosocial behaviors while interacting with during therapy. Additionally, Brekke (2008) found that stereotypic behaviors of child with ASD decreased during Equine-Assisted Therapy.

Despite the fact that some studies have shown that AAT could be beneficial for many individuals, there has remained limited empirical support to validate the overall effectiveness of AAT (Fine, 2010). One of the major limitations to gaining empirical support for the effectiveness of AAT has been that many professionals who utilized AAT did not see the necessity of documenting outcomes or did not take the time to validate outcomes (Voelker, 1995). Without outcomes being documented or validated it was impossible to prove the efficacy of AAT. Additionally, Pavlides (2008, p. 73) reported that the lack of empirical evidence was due to a “lack of consistent protocols, small sample size, absence of adequate controls, or difficulty in quantifying results” (p. 73). With more and more people concerned about evidenced-based interventions, it is important to determine the effectiveness of AAT. In fact, Fine (2010) stated that there is a need for quality-designed studies to gain a better understanding which conditions, populations, and theoretical orientation that AAT works with the best.

### **Statement of the Problem**

Emotional regulation is a skill that is necessary for many aspects of social interaction, communication, and academic achievement. When children do not develop the ability to regulate their emotions, it is likely that emotional dysregulation will occur.

During emotional dysregulation, neurotypical children “may appear stressed or withdrawn and can be prone to attentional difficulties, difficulties adapting to new situations, and the presence of immature regulatory behavior (e.g., fleeing from a situation or hiding behind a caregiver)” (Laurent & Rubin, 2004, p. 289). These symptoms are often exacerbated in children with ASD and could lead to behavioral outbursts. Tantrums and aggressive behaviors are common behavioral outbursts seen in children with ASD. Additionally, emotional dysregulation in children with ASD could decrease social interaction and communication and increase repetitive behaviors.

Animal Assisted Therapy has been theorized to work well as an intervention for the ASD population. Some have believed that animals may help form bonds and increase attachment between the child and their social environments (Martin & Farnum, 2002). This has been accomplished by having the animal act as a transitional object that allowed the child to first form a bond with them and then expand those bonds to others in their environment (George, 1988). Although AAT has been theorized to be beneficial for children with ASD and there has been an increase in research on the effectiveness of AAT with children diagnosed with ASD, there is still a need for more empirical research to determine that it is an evidenced based intervention for this population. Additionally, most of the research on AAT and ASD has focused on the core symptoms of ASD (Alison, 2010; Bass et al., 2009; Brekke, 2008; Krskova et al., 2010; Martin & Farnum, 2002; Nakanishi, 1999; Petrongelli-Halloran, 2010; Redefor & Goodman, 1989; Sams et al., 2006; Stoner, 2002; Terrasi, 2007). Thus, there has remained a need for research focused on the effects that AAT could have on other common problem areas of children with ASD, specifically emotional regulation.



### **Rationale**

Although there was a literature base, though limited, supporting AAT as an effective intervention for children who have ASD, the review of the literature did not reveal any studies on the impact of AAT on the emotional regulation and subsequent behavioral problems of children with ASD (i.e., tantrums and aggression). However, the impact of AAT on the emotional regulation abilities of neurotypical children (Burger, et al., 2009; Turner, et al., 2009) was established. For example, Turner et al. (2009) found that a dog-assisted competence training improved the emotion regulation and recognition of children aged 5 to 7.

Additionally, research on AAT has shown positive impacts on children with aggression (Long, 2009), emotional disorders (Malakoff, 2009), and problem behaviors (Malakoff, 2009; Schneider, 2011). Long (2009) found that elementary through high school students showed an improvement in aggression after participating in an AAT where they were able to train dogs. Another study found that high school students with emotional and behavioral disorders who participated in an AAT group with a dog showed improvements in their symptoms (Malakoff, 2009). Additionally, Schneider (2011) reported that AAT with a therapy dog improved the emotional availability and problem behaviors of children that were at-risk for externalizing and internalizing disorders. Because AAT has been shown to improve the core deficits of ASD and has been shown to improve neurotypical children's emotional regulation and problem behaviors, it was hypothesized that AAT would improve emotional regulation and associated problem behaviors of children with ASD.

### **Statement of the Purpose**

Studies have shown that children with ASD often have difficulties with emotional regulation leading to problem behaviors (e.g., tantrums and aggression). Emotional dysregulation and the associated problem behaviors could be improved through interventions (Macklem, 2008). Animal Assisted Therapy has been an intervention that has shown to be effective for improving these areas of impairment in neurotypical children and adolescents. Additionally, AAT has been shown to be effective for improving the core deficits (i.e., social interaction, communication, and repetitive behaviors) of children with ASD. However, a review of the literature indicated that no research has been conducted to determine the effectiveness of AAT on the emotional regulation and associated problem behaviors (e.g., tantrums and aggression) of children with ASD.

The purpose of this study was to look at the effects of AAT on the associated behaviors of emotional dysregulation, tantrums and aggression, of children with ASD. Specifically, the study investigated whether incorporating a dog into the therapeutic process would show a decrease in tantrum and aggressive behaviors of children who had been diagnosed with ASD. This study increased practitioners' knowledge of effective interventions for children with ASD. Additionally, this study enhanced the research on AAT and using AAT with children who have ASD.

### **Research Questions**

The following research questions were proposed for this study:

- Q1 Will kindergarten children diagnosed with Autism Spectrum Disorder who participate in Animal Assisted Therapy show a decrease in the frequency, as measured weekly by a 5-point Likert scale on the Temper Tantrum Grid of tantrum behaviors?

- Q2 Will kindergarten children diagnosed with Autism Spectrum Disorder who participate in Animal Assisted Therapy show a decrease in the intensity, as measured weekly by a 4-point Likert scale on the Temper Tantrum Grid of tantrum behaviors?
- Q3 Will kindergarten children diagnosed with Autism Spectrum Disorder who participate in Animal Assisted Therapy show a decrease in the duration, as measured weekly by a 10-point Likert scale on the Temper Tantrum Grid of tantrum behaviors?
- Q4 Will kindergarten children diagnosed with Autism Spectrum Disorder who participate in Animal Assisted Therapy show a decrease in the frequency, as measured daily on the OAS, of aggressive behaviors?
- Q5 Will kindergarten children diagnosed with Autism Spectrum Disorder who participate in Animal Assisted Therapy show a decrease in the intensity, as measured by the OAS aggression score, for each aggressive episode of aggressive behaviors?

### **Delimitations**

Participants for this study were children in kindergarten through second grade who had a medical diagnosis of Autism Spectrum Disorder and often had tantrum and aggressive behaviors. The sample was limited to this population to specifically address early elementary students with ASD. Research has shown that interventions for ASD have had the most impact in the early years of development. A single-case, multiple-baseline design, was chosen because it allowed for direct effects on the dependent variables to be measured. Additionally, a single-case, multiple-baseline design was chosen because it was difficult to create homogeneous experimental and control groups, because the symptoms of ASD vary so widely. A small sample size that was associated with a single-case design did not allow for as much generalization, though.

## **Definitions of Terms**

The following terms were utilized in this paper:

*Aggression.* A behavior where a person intentionally attempts to, succeeds in, or threatens to physically assault an object, person, or animal in order to harm them. Examples of this behavior included, but were not limited to, biting, spitting, hitting, kicking, scratching, destroying objects, and throwing of objects.

*Animal Assisted Therapy (AAT).* A goal-directed intervention in which an animal that met specific criteria was an integral part of the treatment process. Animal Assisted Therapy was directed and/or delivered by a health/human service professional with specialized expertise, and within the scope of practice of his/her profession (Fine, 2010).

*Autism Spectrum Disorder.* A diagnosis of Autistic Disorder, Asperger's Disorder, or Pervasive Developmental Disorder-Not Otherwise Specified as defined by the Diagnostic and Statistical Manual of Mental Disorders--Fourth Edition--TR (DSM-IV-TR) or a diagnosis of Autism Spectrum Disorder as defined by the Diagnostic and Statistical Manual of Mental Disorders—Fifth Edition (DSM-V).

*Emotional Regulation.* The ability to appropriately monitor, evaluate, and modify the intensity and timing of positive and negative emotional reactions to specific stimuli to fit the situation.

*Emotional Dysregulation.* The inability to appropriately monitor, evaluate, and modify the intensity and timing of positive and negative emotional reactions to specific stimuli to fit the situation.

*Tantrums.* Uncontrolled, disruptive outbursts of anger or frustration. Examples of this behavior included, but were not limited to, crying, screaming, yelling, stomping feet, flailing arms and/or legs, falling to the floor, and breath holding.

## **CHAPTER II**

### **LITERATURE REVIEW**

This chapter provides a comprehensive review of the literature that was relevant to this study. Specifically, an in-depth review of Autism Spectrum Disorders, emotional regulation, Animal Assisted Therapy will be provided. Additionally, this section includes a review of the literature on Animal Assisted Therapy as an intervention for Autism Spectrum Disorders and emotional regulation.

#### **Autism Spectrum Disorder**

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder with symptoms that are present from the first few years of life. Autism Spectrum Disorder used to describe three of the five Pervasive Developmental Disorders in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR; APA, 2000): Autistic Disorder, Asperger's Disorder, and Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS). In the DSM-V, ASD replaced the Pervasive Developmental Disorders category as an umbrella term that combines Autistic Disorder, Asperger's Disorder, and Pervasive Developmental Disorder Not Otherwise Specified (APA, 2013). The Centers for Disease Control and Prevention (2012) reported that new estimates of children with ASD in the United States were 1 in 88 overall, and 1 in 54 boys. The etiology of ASD has been unknown, but it is believed to have a strong genetic base (Bauman, 2011; Levy et al., 2009; Sundberg, 2004; Thurm & Swedo, 2012). Symptoms of ASD have been characterized by deficits in social interaction,

communication, and restricted repetitive and stereotyped patterns of behaviors and/or interests (American Psychiatric Association [APA], 2000). These symptoms manifest differently depending on the individual and range in severity. Autistic Disorder is the more severe form, whereas as Asperger's Disorder is a milder form.

In the DSM-IV-TR (APA, 2000), Autistic Disorder was characterized by symptoms across the domains of social interaction, communication, and restricted repetitive and stereotyped patterns of behaviors. In order to give a diagnosis of Autistic Disorder, the person had to meet a total of six characteristics, with two being from the social interaction domain and one from each of the other domains (APA, 2000). The social interaction impairments included impairments in non-verbal behaviors (e.g., gestures, facial expressions), lack of developmentally appropriate relationships with peers (e.g., friendships with children who are significantly younger), lack of spontaneous sharing of enjoyment, interests, or achievements with others (e.g., lack of showing, bringing, or pointing out objects of interest), and a lack of social or emotional reciprocity (e.g., limited or inappropriate responses to others; APA, 2000). Impairments in communication included a delay in or lack of verbal language, impairment in initiating or sustaining a conversation with others, use of stereotyped and repetitive or idiosyncratic language (e.g., echolalia), and a lack of developmentally appropriate make-believe play or social imitative play (APA, 2000). Restricted repetitive and stereotyped patterns of behavior, interests, and activities included an abnormal preoccupation with an interest, inflexible adherence to routines or rituals, repetitive motor mannerisms, and a preoccupation with parts of objects (APA, 2000). In addition to the six characteristics of impairment across the three domains, a person had to have a delay or impairment in one

of the following prior to the age of 3: social interaction, language that was used for social communication, or symbolic or imaginative play (APA, 2000). Finally, the characteristics displayed may not be better accounted for by Rett's Disorder or Childhood Disintegrative Disorder (APA, 2000).

Asperger's Disorder was characterized by symptoms across the domains of social interaction and restricted repetitive and stereotyped patterns in the DSM-IV-TR (APA, 2000). The person had to have two of the following impairments in social interaction: non-verbal behaviors; lack of developmentally appropriate relationships with peers; lack of spontaneous sharing of enjoyment, interests, or achievements with others; and a lack of social or emotional reciprocity (APA, 2000). Also, the person had to have one of the following restricted repetitive and stereotyped patterns of behavior, interests, and activities: an abnormal preoccupation with an interest, inflexible adherence to routines or rituals, repetitive motor mannerisms, and a preoccupation with parts of objects (APA, 2000). Additionally, characteristics had to cause a clinically significant impairment in social, occupational, or other important areas of functioning (APA, 2000). The person could not have a clinically significant delay in language, cognitive development, or adaptive behavior (APA, 2000). Finally, the criteria for another Pervasive Developmental Disorder or Schizophrenia were not met (APA, 2000).

According to the DSM-IV-TR, Pervasive Developmental Disorder Not Otherwise Specified was given as a diagnosis when there were impairments in social interaction and impairments in verbal or non-verbal communication or the presence of restricted repetitive and stereotyped patterns of behaviors, interests, and activities that were pervasive and severe (APA, 2000). However, all the criteria were not met for a specific



Pervasive Developmental Disorder (APA, 2000). Included in this category was “atypical autism” where there was a late age of onset or atypical or subthreshold symptomatology (APA, 2000).

Although deficits in social interaction and communication were two separate domains in the DSM-IV-TR, factor analyses of the Autism Diagnostic Observation Schedule (ADOS) and the Autism Diagnostic Interview-Revised (ADI-R) have shown that items under these domains loaded highly onto a single factor (Gotham, 2008; Lord et al., 2000; Lord et al., 1994). Therefore, deficits in social communication and social interaction were changed to one domain under the diagnostic criteria for Autism Spectrum Disorder in the DSM-V (American Psychiatric Association; [APA], 2013).

The range and severity of the presentation of communication and social interaction deficits are highly variable. In the DSM-IV-TR, the range and severity may have been noted by diagnosing the person with either autism or Asperger’s Disorder. People with mild deficits were often diagnosed with Asperger’s Disorder or high functioning autism, whereas others with more severe deficits were diagnosed with autism. In the DSM-V, a severity level is used to differentiate severity. The severity level ranges from 1 which indicates mild deficits to 3 which indicates severe deficits.

Children with ASD could have difficulty communicating verbally and non-verbally (Tager-Flusberg, Edelson, & Luyster, 2011). According to the DSM-IV-TR (APA, 2000), one of the main differences in the criteria for Autistic Disorder and Asperger’s Disorder was a deficit in communication. Children with Autistic Disorder usually had a delay in spoken language, whereas children with Asperger’s Disorder did not. Some children with Autistic Disorder developed spoken language later than was

typical. Others may remain non-verbal for life. Children with Asperger's Disorder often had communication abnormalities (Tager-Flusberg et al., 2011). Once children with Autistic Disorder developed spoken language, they may have similar communication abnormalities.

Verbal skills between the children that did have spoken language range from a few communication abnormalities to being able to produce some words, but not being able to use them effectively. Communication abnormalities include echolalia, unusual vocabulary for their age, unusual voice volume, stereotyped phrases, flat speech, and unmodulated speech (Faraset al., 2010; Tager-Flusberg et al., 2011). Additionally, these children may reverse pronouns--referring to others as "I" and to themselves as "you" (Tager-Flusberg et al., 2011). Furthermore, they often lack a give-and-take in their conversations with others (Wetherby et al., 2004). Other children with Autistic Disorder may gain a minimum use of productive verbal skills (Tager-Flusberg et al., 2011). They may produce some words and sentences, but are not able to use them effectively.

In addition to deficits in verbal communication, children may have deficits in non-verbal communication, such as gestures and facial expressions. Instead of a proximal or distal point, children may take a person's hand and use it as an instrument to make their needs known (Stone & Caro-Martinez, 1990). Additionally, they may develop maladaptive behaviors, such as head banging or biting themselves to express themselves (Tager-Flusberg et al., 2011). Some children with ASD may completely avoid eye contact, whereas others may make fleeting eye contact or have an intense eye gaze (Tager-Flusberg et al., 2011). Additionally, children with ASD often have deficits in joint attention (Mundy, Sigman, & Kasari, 1994; Wetherby et al., 2004). Furthermore,

they are less likely to coordinate gaze, facial expressions, gestures, and sound (Wetherby et al., 2004).

A deficit in social interaction is the main symptom that defines ASD. Although there is no difference in the diagnostic criteria for deficits in social interaction for children with Autistic Disorder and Asperger's Disorder, individuals could have varying degrees of impairment in this domain. Social interaction deficits could present anywhere from having an abnormal social approach to a total lack of initiating social interactions. Children with ASD may only have some difficulty initiating, maintaining, and responding to social interaction, whereas others may find it extremely difficult. Children with ASD may be affectionate with others or they may be aloof. Individuals that are severely impacted "may appear completely oblivious to the presence of others" (Constantino, 2011, p. 139). They could have a lack of response to feelings of others, lack of awareness of social norms, lack of awareness of others' personal space, and an inability to share pleasure (Faras et al., 2010). When it comes to play skills, children with ASD could have a lack of pretend play, interest in play with others, and initiation of play (Faras et al., 2010). Additionally, they may make inappropriate attempts at playing with others (Faras et al., 2010).

In addition to social interaction and communication, restricted repetitive and stereotyped patterns of behaviors and/or interests are variable. Repetitive behaviors could present as stereotyped movements, self-injurious behavior, a need for rituals and routines, a resistance to change, and a restricted interest (Bodfish, Symons, Parker, & Lewis, 2000). Repetitive motor movements could include things such as hand flapping, body rocking, and hand and finger movements. Repetitive self-injurious behavior could

be seen as head banging, biting arms and hands, and scratching oneself. Children with ASD may have a need for rituals and routines such as daily routines and eating routines. Also, children with ASD may insist on sameness and be resistance to change. Problem behaviors may occur when children's routines change. Restricted interests could range from preoccupations with unusual topics (e.g., toilets) to in depth knowledge of common topics (e.g., trains).

Several studies have shown that the subtypes of restricted repetitive and stereotyped patterns of behaviors could be grouped into two factors (Cuccaro et al., 2003; Szatmari et al., 2006). These factors have typically been labeled as a lower level category called "repetitive sensory and motor behaviors" and a higher level category called "insistence on sameness" (Tantam, 2012). The lower level category included hand and finger mannerisms, repetitive use of objects or parts of objects, unusual sensory interests, rocking, and other complex mannerisms or stereotyped movements (Szatmari et al., 2006). The higher level category included difficulties with minor changes in personal routine and the environment, resistance to trivial changes in the environment, and compulsions or rituals (Szatmari et al., 2006). Not all children with ASD present with both of these factors.

### **Emotional Regulation**

Although deficits in social interaction and communication skills and restricted repetitive and stereotyped patterns of behaviors and/or interests are at the core of ASD, individuals with ASD often have difficulties in other areas. One particular area of difficulty that is common for individuals with ASD is emotional regulation. "Emotion regulation (ER) consists of the extrinsic and intrinsic processes responsible for

monitoring, evaluating, and modifying emotional reactions, especially, their intensive and temporal features to accomplish one's goals" (Fox, 1994, pp. 27-28). Emotional regulation allows a person to transition smoothly along the continuum of emotion and arousal states (Laurent & Rubin, 2004). This ability allows a person to achieve and maintain a state of arousal that allows the person function adaptively and be actively engaged with their physical and social environment (Laurent & Rubin, 2004). This state is often referred to as a state of optimal arousal. Children with well-regulated emotions often react to certain contexts with increased positive or negative emotions but are able to calm themselves and return to a regular emotional state (Gulsrud, 2007).

Emotional regulation is a skill that is necessary for many aspects of social interaction, communication, and academic achievement. Studies have shown that emotional regulation was important for establishing positive peer (Denham et al., 2003) and adult relationships (Graziano, Reavis, Keane, & Calkins, 2007). For example, Eisenberg et al. (1993) reported that there was a positive correlation between teacher reports of preschoolers' emotional regulation and social skills. Individuals who were capable of regulating their emotions were "better able to maintain social engagement, to attend to salient aspects of the social environment, to solve problem, and to communicate effectively" (Laurent & Rubin, 2004, p. 287). Additionally, research has shown that emotional regulation was important for early academic success (Graziano et al., 2007; Trentacosta & Izard, 2007). For example, Graziano et al. (2007) found a positive correlation between emotional regulation and teacher reports of kindergartners' academic success and productivity and scores on standardized early literacy and math achievement

tests. Hence, emotional regulation is essential to the development of social, communication, and academic skills.

A child's ability to regulate their emotions slowly emerges, beginning in the early years. The development of emotional regulation begins with frequent instances of dysregulation. Emotional dysregulation is the "inability to respond to stimuli with well-maintained control" (Keenan, 2000, p. 419). Caregivers help children learn more appropriate and effective strategies to regulate their emotions by being responsive to early signs of emotional dysregulation and modeling appropriate regulation strategies (Laurent & Rubin, 2004). For example, Laurent and Rubin (2004) stated that caregivers guide children through certain interactions and experiences, including: "tolerating a range of social and sensory experiences," "using early developing behavior strategies to regulate arousal," "using language strategies to guide behavior," and "using metacognitive strategies to plan and complete activities," that helps them learn how to expand their range of self-regulation abilities. As children develop, they are increasingly able to experience a range of emotions while maintaining a state of optimal arousal. By kindergarten, children are expected to have basic skills to regulate their emotions on their own (Gilliom, Shaw, Beck, Schonberg, & Lukon, 2002).

When children do not develop the skills to regulate their emotions, it is likely that emotional dysregulation will occur. During emotional dysregulation, neurotypical children "may appear stressed or withdrawn and can be prone to attentional difficulties, difficulties adapting to new situations, and the presence of immature regulatory behavior (e.g., fleeing from a situation or hiding behind a caregiver)" (Laurent & Rubin, 2004, p. 289). Additionally, children who are unable to regulate their emotions may become

overwhelmed by their emotions and behave in ways that are considered maladaptive. Studies have shown that patterns of emotional dysregulation could lead to internalizing (Shaw, Keenan, Vondra, Delliquadri, & Giovannelli, 1997) and externalizing behaviors (Eisenberg, et al., 1996). For example, studies have shown that emotional dysregulation is associated with aggression (Cohn et al., 2010; Izard et al., 2008; Sullivan et al., 2010; Tager et al., 2010) and tantrums (Giesbrecht, 2008). Eisenberg et al. (1993, 1996) found that children who had difficulties regulating their emotions were more likely to express anger and aggression. Additionally, emotional dysregulation has consistently been linked to psychopathology including depression (Silk, Steinberg, & Morris, 2003), anxiety (Suveg & Zeman, 2004), eating disorders (Svaldi, Griepenstroh, Tuschen-Caffier, & Ehring, 2012), and disruptive behavior disorders (Ozdemir, 2011; Walcott & Landau, 2004).

Children with ASD often have difficulties regulating their emotions. Confirming the fact that children with ASD may struggle with emotional regulation, Rieffe et al. (2011) found that parents of children with ASD reported more emotional problems in their children than parents in a control group. Additionally, Garon et al. (2009) reported that infants who were later diagnosed with ASD had a lower positive affect and poorer regulation of negative emotions when compared to a control group. In a retrospective study, Gomez and Baird (2005) found that parents of children with ASD reported that their children had significantly more difficulties with self-regulation than a comparison group. Furthermore, Konstantareas and Stewart (2006) found that children with ASD used less effective emotion regulation strategies than a control group.

Although there is growing consensus that emotional dysregulation is a serious concern for this population, empirical studies on emotion regulation in children with ASD are limited. However, studies have shown that the symptoms of emotional dysregulation were often exacerbated in children with ASD and often lead to externalizing behaviors (e.g., tantrums and aggression; Mazefsky et al. 2012). Vitiello and Stoff (1997) defined aggression as “a behavior deliberately aimed at inflicting physical damage to persons or property” (p. 307). Examples of these behaviors included, but were not limited to, hitting, kicking, head banging, and breaking objects. Similar to aggression, tantrums were defined as “brief but intense emotional episodes that are characterized by explosive, impulsive, out-of-control, whole body displays of anger” (Giesbrecht, 2008, p. 27). Crying, whining, screaming, throwing self on floor, and stomping feet were all examples of tantrum behaviors. Definitions of these behaviors were similar in the autism literature.

Tantrums and aggressive behaviors were common externalizing behaviors seen in children with ASD. Additionally, these types of behavioral outbursts were often co-occurring behaviors in children who had ASD. In a sample of 777 children with autism, tantrums and aggression were present in more than 90% of the total sample (Mayes & Calhoun, 2011). Dominick et al. (2007) found that 70% of children with ASD had experienced a period of severe tantrums, 60% of these occurred on a daily basis and were constant. They also found that 38% of children with ASD displayed aggressive behavior and that aggression, self-injury, and tantrums were significantly associated with each other. Additionally, Kanne and Mazurek (2011) found that, in a sample of 1,380



children and adolescents with ASD, parents reported that 68% had demonstrated aggression to a caregiver and 49% to non-caregivers.

It is important that deficits in emotional regulation and the associated challenging behaviors be addressed because they are often linked to negative outcomes. For example, these deficits could exacerbate the core symptoms of ASD (i.e., deficits in communication, socialization, and restricted repetitive behaviors). Children with ASD who exhibited atypical behaviors (e.g., aggression and tantrums) tended to have lower non-verbal IQs, lower levels of expressive language, more severe social deficits, and more repetitive behaviors (Dominick et al., 2007). Additionally, anger in children with ASD was associated with more bullying and victimization of bullying (Rieffe et al., 2012). Tsakanikos, Costello, Holt, Sturmey, and Bouras (2007) found that people with ASD who had behavior problems, especially aggression, were more likely to use anti-psychotics. In children with developmental disabilities, aggression was a strong predictor of crisis intervention re-referrals (Shoham-Vardi et al., 1996) and admission and readmission to residential facilities (Lakin, 1983). Additionally, behavior problems of young adults with an intellectual disability, including autism, were a strong predictor of out of home placement (McIntyre et al., 2002).

In addition to people with ASD, behavior problems affect their caregivers. In the study of young adults with an intellectual disability, including autism, behavior problems significantly accounted for variance in maternal stress (McIntyre et al., 2002). Additionally, Lecavalier, Leone, and Wiltz (2006) found that behavior problems of children with ASD were strongly associated with parent and teacher stress. Since emotional dysregulation and the associated problem behaviors could have such negative

impacts on children with ASD, it is important to address these deficits early. Treatment of these deficits could help reduce their impact.

### **Interventions for Emotional Regulation| of Children with Autism**

During the last several years, significant progress has been made in the development of interventions for children with ASD. Intervention approaches range from educational to clinical to biomedical (e.g., medications and nutrition). Unfortunately, there is not a single intervention that works for all children with ASD. Since the symptoms of autism are highly variable, there is a need for a variety of interventions. Additionally, interventions should be individualized to the child's strengths and needs. Consistently noted, however, was that early intensive interventions were the most effective for long-term outcomes.

Some examples of early intensive interventions included traditional Applied Behavior Analysis approaches, such as Discrete Trial Teaching and Pivotal Response Training. These approaches were based on the tenets of learning theory and operant conditioning. These behavioral interventions aimed to improve the core deficits of ASD and usually did not focus directly on emotional regulation as a goal, except Pivotal Response Training, which viewed it as part of behavioral self-regulation (Koegel & Koegel, 2006; Leader et al., 2009; Smith, 2001; Thompson, 2010). Most behavioral intervention models assume that emotional regulation will improve with the development of social interaction and communication skills and decrease of repetitive/restricted and challenging behaviors (Thompson, 2010).

Furthermore, there are also naturalistic, developmental models that directly aim to improve emotional regulation in children with ASD. Developmental-Individual

Difference- Relationship Based model is an early, naturalistic, developmental intervention approach that promotes emotional self-regulation. Additionally, the Social Communication/ Emotional Regulation/ Transactional Support (SCERTS) program is also considered to be a naturalistic, developmental model, although it draws from a variety of models. These models follow a developmental approach and directly target aspects of emotional regulation by developing a plan that has specific goals to increase emotional growth and awareness (Prizant, Wetherby, Rubin, & Laurent, 2003; Roffman, Wanerman, & Britton, 2011).

Dr. Stanley Greenspan and Dr. Serena Wieder developed the Developmental-Individual Difference-Relationship Based model (DIR model). The DIR model was based on the theory that deficits in ASD stemmed from differences in the way the individual processed information (Wieder, 2012). They theorized that typical children processed information through emotional channels in the brain and children with ASD did not have easy access to these channels (Roffman et al., 2011). Greenspan and Wieder believed that typical children reached six developmental milestones through emotional experiences: “1) self-regulation and interest in the world, 2) shared attention and pleasure in relationships, 3) two-way communication, 4) complex communication, 5) emotional ideas, and 6) emotional thinking” (Roffman et al., 2011, p. 32). Floor time is a central component of the DIR model where the caregiver is seen as the therapist who works with the child to help them progress through these six phases of emotional development. The goal of DIR is to help the child work around their information processing difficulties to increase their emotional connection to their caregivers (Bartels, 2004). Once the

relationship is established, it will serve as the basis for helping the child progress through the stages of development (Bartels, 2004).

Although there are other components of DIR, floor time is one of the main techniques used. Floor time is basically unstructured play sessions that the caregiver engages in with the child (Wieder, 2012). During floor time, the caregiver follows the child's lead and plays with whatever the child is interested in at the time (Bartels, 2004). The caregiver acts as a facilitator to support play while remaining non-directive (Bartels, 2004). There are three parts to floor time (Bartels, 2004). First, the caregiver uses specific therapeutic techniques that are suggested by the DIR therapist. Second, other specialists (e.g., speech therapist and physical therapists) work with the child to address the child's specific challenges. Third, caregivers work with the DIR therapist to modify the therapeutic techniques to maximize their interactions with the child. As the caregiver "plays" with the child, the child is pulled out of their isolation and the caregiver is seen as a "rewarding source of interest to the child" (Bartels, 2004, p. 49). The therapeutic techniques that are used will vary from child to child.

The SCERTS model believes that social communication, emotional regulation, and transactional support are the primary developmental dimensions that should be addressed in a program for individuals with ASD (Prizant et al., 2003). The SCERTS model addresses emotional regulation challenges by initially assessing the child's capacity to maintain a well-regulated state (Prizant et al., 2003). The practitioner begins by documenting the factors that support or interfere with the child's ability to regulate their emotions and the signals they give when they need support (Prizant et al., 2003). The child's behavioral signals are categorized on a continuum that ranges from well-

regulated to extremely dysregulated (Prizant et al., 2003). Depending on the child's level of arousal, specific goals are developed to teach emotional regulation strategies (Prizant et al., 2003). The goals are also based on the child's linguistic and cognitive levels. In addition to teaching the child regulation strategies, preventative and reactive strategies may be included in the plan.

In addition to the aforementioned programmatic intervention models, Cognitive Behavioral Therapy (CBT) could be used to improve emotional regulation in children with ASD. Cognitive Behavioral Therapy is a psychotherapeutic approach that uses a variety of techniques to change maladaptive thinking that effects a person's affect and behavior. During CBT, therapists help individuals challenge and replace their maladaptive thoughts and beliefs with more realistic and effective ones. There are several CBT strategies that can be used to improve an individual's emotional regulation, such as learning to identify and label emotions, relaxation strategies, self-talk, acceptance, using a problem solving sequence, using a power card, meditation, and social stories (Macklem, 2008).

Studies have shown that CBT could improve emotional regulation in children with ASD (Attwood, 2004; Chalfant, Rapee, & Carroll, 2007; Scarpa & Reyes, 2011; Sofronoff, Attwood, & Hinton, 2005; Sofronoff, Attwood, Hinton, & Levin, 2007; Wood et al., 2009). For example, Scarpa and Reyes (2011) used group CBT with 11 children in the range of 5-7 years old with high functioning autism. The children participated in nine weekly group sessions that focused on affective education, stress management, and understanding expressions of emotions. The participants were taught relaxation, physical, social, and cognitive strategies to improve emotion regulation. The children's

parents also participated in nine psychoeducational group sessions to help support their children at home. Results showed that the children improved their emotional regulation after participating in CBT.

Additionally, play therapy is psychotherapeutic approach that is theorized to be an effective intervention for increasing emotional regulation in children with ASD (Gallo-Lopez & Rubin; 2012). Play therapy is an individualized, play-oriented approach to working with children. During sessions, the therapist follows the child's natural interests and challenges them towards greater mastery of their social, emotional, and intellectual abilities. Play therapy can be indirect, where the therapist allows the child to choose what they will play with and how, or directive, where the therapist plans an activity for the child that targets certain goals. There are many types of play-based interventions for children with ASD including LEGO therapy, Drama Therapy, Sand Tray therapy, and Filial Therapy. Animal Assisted Therapy (AAT) is similar to and can be incorporated in play therapy (Animal Assisted Play Therapy).

### **Animal Assisted Therapy**

AAT is a goal-directed intervention provided by a qualified professional that incorporates an animal into the therapeutic process (Kruger & Serpell, 2010). Animal Assisted Therapy could be used in conjunction with other therapeutic interventions such as occupational therapy, physical therapy, and speech therapy. For example, Canine Assisted Play Therapy incorporates the use of a certified therapy dog with play therapy techniques. Animal Assisted Therapy is also known as pet therapy, pet-facilitated therapy, animal-facilitated counseling, pet-mediated therapy, and co-therapy with an

animal (Kruger & Serpell, 2010). Equine-Assisted Therapy, Hippotherapy, and Dolphin-Assisted Therapy are all types of AAT (Pavlidis, 2008).

Several types of animals could be used in AAT including dogs, cats, horses, dolphins, birds, reptiles and other small animals. Animal Assisted Therapy uses specially trained therapy animals and not the client's pet. Whenever possible, the animal should be registered for the use of therapy. Pet Partners, formerly Delta Society, registers dogs, cats, and other non-farm domesticated animals such as rabbits, miniature horses, llamas, and birds. Horses could be registered through the North American Riding for the Handicapped Association (NARHA), Equine Facilitated Mental Health Association (EFMHA), or the American Hippotherapy Association (AHA). All animals used in therapy should have excellent temperaments, be calm and gentle, enjoy being around people, be obedient, be able to regain self-control after play or excitement, be able to sit quietly for extended periods, and be attentive to the handler (Fine, 2010). The handler should know their animal well enough that they are able to recognize the animal's stress signals and signs of fatigue in order to keep the animal and other people safe.

During AAT, the client participates in activities with the animal that are individually designed to meet their specific goals. A variety of techniques may be used during AAT to incorporate the animal into the therapeutic process. Some activities that may be included in the therapy sessions are: petting the animal, walking the animal, learning how to take care of the animal, playing games with the animal, horseback riding, and training the animal. O'Callaghan (2008) conducted a survey on the various animal-assisted techniques that mental health professionals incorporated into their practice. The top five techniques were: reflecting on the client's relationship with the animal,

encouraging the client to interact with the animal, sharing information about the animal's family history, sharing history that was related to the therapy animal, and sharing animal stories and metaphors with animal themes (O'Callaghan, 2008). The variability of techniques allows for AAT to be used with a wide variety of populations and treatment modalities including individual therapy and group therapy. Furthermore, AAT could be incorporated into a wide variety of settings including schools, hospitals, nursing homes, prisons, and private practices (Altschiller, 2011).

There are many theories in the field of AAT that attempt to explain how and why the human-animal bond is potentially therapeutic. One theory that has been cited in the AAT literature was that animals could produce calming effects that help reduce a person's anxiety and arousal (Kruger & Serpell, 2010). Others theorized that animals could serve as catalysts of the therapist/patient bond (Kruger & Serpell, 2010). Proponents of this theory suggested that animals stimulate conversation and unscripted behavior by providing a neutral, external focus point. The animal mediates social interaction and expedites the rapport-building process. Another theory postulated that animals may help form bonds and increase attachment between the client and their social environments (Martin & Farnum, 2002). This is accomplished by having the animal act as a transitional object that allows the client to first form a bond with them and then expand those bonds to others in their environment (George, 1988). Finally, theories have claimed that the use of animals as living, interactive tools allows people to see both themselves and the world in new ways and adds new skills and responses to their behavioral repertoires (Kruger & Serpell, 2010). These theories focus more on the



working relationship between the client and the animal instead of the claim that there are intrinsic attributes of animals that contribute to therapy.

### **History of Animals in Therapy**

Throughout history, there has been evidence of a bond between humans and animals. Archeological evidence showed that over 14,000 years ago humans lived with domesticated wolves (Serpell, 2008). Early dogs were treated as partners in hunting and fishing. Eventually, both dogs and cats had roles in agriculture. Similar to today, dogs assisted in herding and cats eliminated rodents. Moreover, ancient Egyptians were known to respect dogs and cats (Walsh, 2009). Cats were honored and worshipped because they were associated with a goddess. Dogs were seen as companions during life and guides in the afterlife. Greeks and Romans commonly kept dogs as hunters, herders, and guardians in addition to beloved pets (Coren, 2002).

Although there was a long history of the human-animal bond, it was not until the 17th century that documentation showed that animals were used to benefit human health. Writings showed that, in 1699, John Locke advocated for children caring for animals “as a means of encouraging them to develop tender feelings and a sense of responsibility for others” (as cited in Serpell, 2008, p. 25). In the 18th century, many reformers believed that children should care for and control animals to learn how to reflect on and control their own innately beast-like characteristics (Serpell, 2008). Additionally, compassion and concern for animals was a common theme of 18th and 19th century children’s literature, which was used to teach kindness and gentility (Serpell, 2008).

In 1792, the first documented use of animals in therapy occurred at the York Retreat in England (Macauley, 2006; Serpell, 2008). The retreat had courtyards that were

supplied with farm animals that were used improve the attitude of mental health patients (Macauley, 2006, Serpell, 2008). The use of animals in mental institutions became increasingly common England and elsewhere in the 19th century (Serpell, 2008). In 1919, animals were incorporated into mental health programs in the United States at St. Elizabeth's Hospital in Washington, DC (Macauley, 2006). Despite the apparent success of integrating animals into mental health institutions, therapeutic techniques changed and animals were eliminated from the institutions by the early years of the 20th century (Allderidge, 1991).

For the following 50 years, animals were only mentioned in medical contexts with the concern of zoonosis or as a symbolism for the origins of mental illness in psychoanalytic theories (Serpell, 2008). However, in 1962, a child psychologist, Boris Levinson, reincorporated animals into the treatment of mental illness. Levinson was credited with integrating AAT into clinical psychology with publication of "The Dog as a 'co therapist'" (Chandler, 2001). Levinson discovered that significant progress could be made with a disturbed child when his dog attended therapy sessions. Additionally, he found that many children that were typically withdrawn and uncommunicative would interact positively with the dog (Levinson, 1969).

Since 1962, animals have been incorporated into the treatment of various populations. For example, a dog named Skeezer was a permanent resident at Children's Psychiatric Hospital in Ann Arbor, Michigan, and was utilized as a co-therapist in the treatment of children who were emotionally disturbed (Yates, 1973). In the 1970s, psychiatrist Michael McCulloch prescribed pets to patients as a means to improve their quality of life (Morrison, 2007). Additionally, in the 1970s, animal assisted therapy

programs were developed by Dr. Leo Bustad at Pullman Memorial Hospital and Tacoma Lutheran Nursing Home (Morrison, 2007). In 1973, the Humane Society of Pikes Peak, Colorado, established a “petmobile” program that brought animals to visit people in nursing homes (Morrison, 2007). In 1977, Dr. Dean Katcher and Erika Friedmann found that people who interacted with pets had lower blood pressures and mortality rates (Morrison, 2007). Although AAT has been used in various settings for centuries, there has been very little research on its effectiveness in the mental health field.

### **Animal Assisted Therapy as an Intervention for Individuals with Autism**

Animal Assisted Therapy has become an increasingly popular research topic, especially when used for children with ASD. Though limited, there is an emerging literature base for effects of AAT on the core deficits and other common co-occurring problems of ASD (Alison, 2010; Bass et al., 2009; Brekke, 2008; Krskova et al., 2010; Martin & Farnum, 2002; Nakanishi, 1999; Petrongelli-Halloran, 2010; Redefers & Goodman, 1989; Sams et al., 2006; Stoner, 2002; Terrasi, 2007). Several studies have shown that the use of a therapy dog has had positive effects on children with ASD (Alison, 2010; Martin & Farnum, 2002; Nakanishi, 1999; Petrongelli-Halloran, 2010; Redefers & Goodman, 1989).

Studies have shown that AAT has had a positive impact on social behavior of children with ASD. For example, Redefers and Goodman (1989) researched the effects of a dog intervention on the social behavior of children with ASD. During the intervention, the participants interacted with the dog through various activities (e.g., petting, ball-throwing, grooming) while the therapist slowly included themselves into the activities across sessions. Results showed an increase in prosocial behaviors (e.g., joining the

therapist in games, initiating activities with the therapist) and a decrease of repetitive behaviors (e.g., hand posturing, spinning objects, jumping). Additionally, Alison (2010), Nakanishi (1999), Martin and Farnum (2012), and Petrongelli-Halloran (2010) showed that dogs increased social behaviors of children who had ASD. Studies have also shown that the use of other animals, such as, guinea pigs (Krskova et al., 2010), llamas, and rabbits (Sams et al., 2006), have also increased social behaviors of children with ASD.

In addition to social behaviors, studies have shown that AAT could improve communication in children with ASD. For example, Alison (2010) used dogs in a home-based intervention with children diagnosed with ASD. During the baseline, participants were allowed to play with an assortment of toys (e.g., balls, plush dog, board games, books, crayons) while the experimenter was present. In the intervention phase, a dog was introduced and the participant had the choice of playing with the dog or toys. Results indicated that participants increased communicative behaviors (i.e., expressive toward another, non-verbal communication, and responding appropriately to directions or questions). Nakanishi (1999) and Martin and Farnum (2012) also showed that dogs could increase communicative behaviors of children with ASD. Additionally, horses (Stoner, 2002), Dolphins (Terrasi, 2007), and llamas and rabbits (Sams et al., 2006) have been shown to increase communicative behaviors of these children.

Restrictive and repetitive behaviors have also been improved by AAT. For example, Redeker and Goodman (1989) found that children with ASD who participated in AAT with a dog showed a decrease of repetitive behaviors (e.g., hand posturing, spinning objects, jumping). Additionally, Alison (2010) showed that using dogs in a home-based intervention decreased restricted repetitive and stereotyped behaviors (e.g., hand

flapping, body rocking, finger flicking). In addition to dogs, horses (Brekke, 2008) have been shown to decrease stereotypical behaviors of children with ASD.

### **Animal Assisted Therapy as an Intervention for Emotional Regulation**

Animal Assisted Therapy has also been shown to improve emotional regulation in a variety of populations. In children who were typically developing, studies reported that AAT increased emotional regulation and recognition (Burger et al., 2009; Turner et al., 2009). For example, Burger et al. (2009) used an animal assisted group training technique called Multiprofessionelle Tiergestutzte Intervention (MTI) to develop emotional regulation and recognition skills of adolescents. Multiprofessionelle Tiergestutzte Intervention's core principal is having respectful interactions with a therapy dog (Chandler, 2001). Throughout the group training, participants completed basic and special modules that integrated a therapy dog (Chandler, 2001). Modules included activities with the dog such as grooming, agility courses, playing, and basic commands (e.g., sit, stay, come; Chandler, 2001). The training took place in school on a weekly basis and was conducted by a multi-professional team. Participants were 27 students between the ages of 11-14. A pre-post design was used with an intervention group that was compared to a respective control group. The Skalen zum Erleben von Emotionen (SEE) questionnaire was used to analyze the participants' perception and regulation of emotions. Additionally, the Self-Perception Profile for Children (SPPC-D) was used to measure participants' self-esteem and well-being. Results indicated that participants in the animal assisted group training improved emotion regulation and recognition. Additionally, participants in the AAT group showed significant positive changes in self-esteem and well-being.

Turner et al. (2009) also used the MTI technique to develop emotion regulation and recognition in children. Participants consisted of 19 first grader students between the ages of 5-7. A pre-post design was used where the intervention group was compared to a respective control group. The Questionnaire Emotion Regulation and Vienna Emotion Recognition Tasks (VERT-K) were used to assess the participants' emotion regulation and recognition. The results indicated that participants in the intervention group showed significantly larger improvements in adaptive strategies than the control. Additionally, participants in the intervention group increased their emotion recognition skills. Overall, the researchers concluded that the AAT technique improved emotional regulation, emotion recognition, and emotional competence.

Another study found that AAT improved emotional regulation and emotional status of male drug-addicted criminal offenders (Burger et al., 2011). Burger et al. (2011) used the MTI technique with male drug-addicted criminal offenders (Burger et al., 2011). The study consisted of three treatment groups: MTI training ( $n = 36$ ), work integration training ( $n = 12$ ), and group therapy ( $n = 12$ ). The Skalen zum Erleben von Emotionen and the Emotional Management Inventory (EMI-B) were used to assess emotional competence and status. The results indicated that participants in all groups benefited from the different treatments. However, the MTI group improved significantly more on the areas of emotional regulation, emotional self-control, and acceptance of emotions. Additionally, they were able to reduce their depressive emotions, aggressive emotions, and imbalanced feelings.

Additionally, AAT has been shown to improve emotional regulation for at-risk and delinquent girls. Foley (2008) conducted a qualitative study to research the effects of

Equine Assisted Therapy for at-risk and delinquent girls. Participants included 46 girls, ages 12 to 18 years, who were considered at-risk or delinquent and were referred by social services, probation, mental health professionals, or their parents. All girls participated in the Horseback Miracles Program, an Equine Assisted Therapy program designed to help delinquent youth develop prosocial competencies, self-esteem, social supports, self-efficacy, communication and social skills. The treatment plan was individualized to each participant's experience and unique fears and issues. During the intervention, girls completed various riding tasks and assigned chores, such as feeding, watering, and grooming the horses. To determine the program's impact on the participants, the researcher used observations and direct interviews with the participants and staff. The researcher concluded that the program empowered the participants and improved their ability to focus, manage their emotions, control their behavior, and relax. Additionally, staff reported fewer problem behaviors and greater proactive behaviors.

### **Animal Assisted Therapy as an Intervention for Externalizing Behaviors**

Numerous studies have researched the effects of AAT as an intervention for externalizing behaviors. Animal Assisted Therapy has been shown to decrease aggression (Long, 2009), decrease anger (Kaiser, Spence, Lavergne, & Bosch, 2004), decrease disciplinary referrals (Schneider, 2011), and improve behavior problems (Boe, 2007; Chronister, 1993; Emory, 1992; Malakoff, 2009; Stebbins, 2012; Whitely, 2009). For example, Long (2009) researched the effects of using trained dogs with children and adolescents to decrease aggressive behaviors. Participants included 210 elementary through high school students that were enrolled at an alternative school due to disruptive behaviors. The students were "referred to the alternative school through school systems

or the Tennessee Department of Children's Services" (Long, 2009; p. 28). The researcher used the Achenbach Child Behavior Checklist (CBCL), serious incident reports, and in-school suspension referrals to measure the students' aggressive behaviors. Students in the treatment group trained dogs using various commands throughout 10 weeks while the control group did not participate. Results showed that participants in the treatment group significantly improved their scores on the CBCL, had fewer serious incident reports, and had a significant change in in-school suspension assignments. The researcher concluded that AAT had a positive impact on the students' aggression levels.

Kaiser et al. (2004) also researched the effects of AAT, specifically Equine-Assisted Therapy, on children's anger. The study consisted of 16 children, ages 6 to 16 years. The children participated in a 5-day therapeutic horseback-riding program. The researchers used the Children's Anger Inventory, Peds Quality of Life, and Self-Perception Profile for Children as pre- and post-measures of children's anger. Overall, the results showed that the Equine Assisted Therapy significantly improved the children's anger level.

Schneider (2011) used AAT with high-risk boys to assess the human-animal bond and behavior problems. Nine male children, ages 5 to 11 years, who were considered to be at-risk for internalizing and externalizing behaviors, participated in the study. The researcher used the Emotional Availability Scale, Fourth Edition and the Pet Bonding Scale to measure the participants' bond with the animal. Additionally, the Child Behavior Checklist (CBCL), the Teacher Report Form (TRF), school attendance records, and disciplinary referral records were used to measure the participants' behavior problems. During the intervention, the participants interacted with a trained dog and



taught them various commands throughout 10-12 sessions. The results indicated that the participants significantly increased their emotional availability toward the dog and therapist. Additionally, there was a significant decrease in disciplinary referrals. However, no significant changes on the CBCL, TRF, or school attendance records were found.

Additionally, Malakoff (2009) compared the effects of AAT to traditional cognitive-behavioral therapy on students with emotional and behavioral disorders. Sixteen students, ages 12 to 18 years, who attended an alternative high school for students with emotional disturbance, participated in the study. Nine of the students received AAT and seven received traditional cognitive-behavioral therapy. The researcher used the Student Information Form, School Daily Point System, Teacher Report Form, Youth Self Report, Adolescent Psychopathology Scale, and Post-treatment Interviews to measure the participants' emotional and behavioral symptoms. Overall, the results indicated that both groups improved their emotional and behavioral symptoms. Although AAT was not significantly more effective than traditional cognitive-behavioral therapy, it was effective for students with emotional and behavioral disorders.

Furthermore, Whitely (2009) researched the effectiveness of Equine-Assisted Therapy with at-risk adolescents. Participants included 20 adolescents, ages 12 to 19 years, who resided at a children's home residential facility. The participants were randomly assigned to one of two treatment groups. Participants in the Equine-Assisted Therapy group engaged in activities with the horse, except mounting or riding the horse, while the therapist used various techniques such as reflecting on the client's relationship with the horse and using the horse to engage the client in therapeutic discussions. The

sessions were over the course of 6 weeks. The researcher used the Youth Outcome Questionnaire-Self Report, the Youth Outcome Questionnaire parent/guardian version, structured interviews, behavioral observations, and session notes to measure the participants' outcomes. Statistical significant differences were found on the Youth Outcome Questionnaire parent/guardian version. However, no significant differences were found on the self-report. Seven major themes were developed from the qualitative data analysis: relationship skills, emotional awareness, responsibility, self-control, self-awareness, self-concept, and empathy. Overall, the researcher concluded that Equine-Assisted Therapy was effective for reducing maladaptive behaviors and emotional symptoms of at-risk adolescents.

Stebbins (2012) also researched the effects of Equine-Assisted Therapy. Participants in this study were 51 students, ages 8 to 15 years, who had been identified as emotionally disturbed and were receiving special education services at an alternative school for at-risk students with emotional and behavioral problems. The students received 10 Equine-Assisted Therapy sessions over 9-10 weeks. During the sessions, students spent half of the time on groundwork and the other half on riding. The Behavior Assessment System for Children, Second Edition (BASC-2), Teacher Rating Scale (TRS), Parent Rating Scale (PRS), and Self-Report of Personality (SRP) were used to measure outcomes. Results showed the teachers reported significant reductions in Externalizing Problems and Behavior Symptoms Index on the BASC composite scores. However, no other significant results were found.

These studies demonstrated the benefits of using AAT, including Equine-Assisted Therapy, to improve externalizing behaviors of children and adolescents. Specifically,

AAT improved children's and adolescents' aggression, anger, and problem behaviors.

Through AAT, individuals were able to learn various skills, including problem-solving skills, communication skills, empathy, and patience, which enabled them to regulate their emotions and problem behaviors.

## **CHAPTER III**

### **METHOD**

The purpose of this study was to examine the effects of Animal Assisted Therapy (AAT) on tantrum and aggressive behaviors of children diagnosed with Autism Spectrum Disorder (ASD). The study used a single-case, non-concurrent multiple-baseline-across-participants design. This chapter provides information about the study's research design, participants, variables and measures, procedures, data analysis, and research questions.

#### **Research Design**

This study used a single-case, non-concurrent multiple-baseline-across-participants design. A single-case research design was chosen because it was difficult to create homogeneous experimental and control groups, as the symptoms of ASD varied so widely. Additionally, this type of design allowed for the everyday behaviors that would potentially be affected by the AAT intervention to be closely observed and measured repeatedly. In a single-case design, experimental control is demonstrated by using one participant as both the control and experimental participant. That is, the participant is compared to himself or herself and not to others in the study. In this type of design, all conditions are held constant except for the independent variable, which is systematically introduced and withdrawn to study its effects on the dependent variable. When a consistent effect on the dependent variable is established, a functional relation has been demonstrated.

Due to the difficulty of recruiting participants who met the requirements for this study, a non-concurrent design was utilized. A non-concurrent multiple-baseline design does not require the baseline data to be collected simultaneously. This allows for greater flexibility in recruitment of participants and is often recommended for research in an educational setting (Harvey, May, & Kennedy, 2004). This design allows the researcher to begin collecting baseline data with each participant at any time. Once a stable baseline is established (i.e., a consistent pattern in the level or rate of behavior), the independent variable is administered across the participants. During the intervention phase, measurement of the dependent variables continues. The data collected during both phases is then compared to determine the effects of the independent variable. “If changes in the dependent variable occur only when the independent variable is introduced, then a functional relation is demonstrated” (Kennedy, 2005, p. 152).

### **Participants**

Participants were recruited via local elementary schools, autism groups, and mental health professionals who worked with children with autism in a metropolitan area using volunteer sampling. Participants were kindergarten through second grade students who had a diagnosis of an Autism Spectrum Disorder made by a mental health practitioner or physician using the DSM-IV criteria. Additionally, all participants had average cognitive scores. This was important, because the intervention included cognitive components that an average child should be able to learn. The participants had difficulty regulating their emotions, manifested as tantrums and aggressive behaviors. This was based on parent reports of the student demonstrating tantrums (as defined in the following section) and aggressive behaviors (as defined in the following section) five or

more times a week. According to the participants' parents, the students did not have allergies to animals, a fear of dogs, or a history being aggressive towards animals.

### **Instrumentation**

Although this study was interested in the effects on emotional dysregulation, emotional dysregulation is difficult to define in measureable terms. Tantrums and aggressive behaviors are observable behaviors of emotional dysregulation that are commonly seen in children with ASD (Mazefsky et al., 2012). Therefore, the dependent variables were the participants' tantrum and aggressive behaviors. Tantrum behaviors were defined as uncontrolled, disruptive outbursts of anger or frustration. Examples of tantrums included, but were not limited to, crying, screaming, yelling, and stomping feet. Aggressive behaviors were defined as behaviors where a person intentionally attempts to, succeeds in, or threatens to physically assault an object, person, or animal in order to harm them. Examples of aggression included, but were not limited to, biting, spitting, hitting, kicking, scratching, destroying objects, and throwing of objects. A review of the literature specific to these dependent variables identified several measures appropriate for assessing the outcome variables. The following measures were selected to assess tantrum and aggressive behaviors.

#### **Temper Tantrum Grid**

This study used the Temper Tantrum Grid (Giesbrecht, 2008) to measure the frequency and intensity of tantrum behaviors (see Appendix A). The Temper Tantrum Grid was developed by Dr. Ferald Giesbrecht and was based on tantrum research by Potegal and Davidson (2003). Permission to use this measure was granted to the researcher for use in this study by Dr. Giesbrecht (see Appendix B). This measure was

chosen because it was sensitive to small change over time and measured multiple components of tantrums (i.e., frequency and intensity). It has been found to be a valid and reliable tool to measure tantrum behaviors of preschoolers (Giesbrecht, 2008; Giesbrecht, Miller, & Muller, 2010).

The scale includes 4 physical reactions, 2 comforting behaviors, and 12 behaviors that were commonly associated with temper tantrums. Each item was rated on a 5-point Likert-type scale (ranging from *Never* to *All of the Time*) that measured frequency and a 4-point Likert-type scale (ranging from *Little or None* to *Severe*) that measured intensity. Additionally, a 10-point Likert-type scale (ranging from *Less Than 5 Minutes* to *More Than 50 Minutes*) was added to measure the duration of tantrum behaviors. The rater was instructed to disregard times when the child “was reacting to injury (e.g., falling off a bike), reacting in fear (e.g., screaming because of fear of a dog), squabbling with siblings (however, if squabbling turned into a tantrum then they were instructed to include the tantrum), and times when the child was openly defiant (e.g., looking the parent in the eye and disobeying)” (Giesbrecht, 2008, pp. 52-53). Although this measure asked raters to rate the frequency and intensity of tantrum behaviors in the past month, this study modified the instructions to look at the frequency and intensity of tantrum behaviors in the past week. Because participants’ physical reactions or comforting behaviors were not of interest in this study, these six items were removed from the measure.

Scoring of the adapted Temper Tantrum Grid used for this study resulted in three scores. Adding the frequency score for each behavior generated a frequency of tantrums score. Scores ranged from 12-60. Higher scores indicated a greater frequency of tantrum behaviors. Adding the intensity score for each behavior generated an intensity of

tantrums score. Scores ranged from 12-48. Higher scores indicated more intense tantrums. Adding the duration score for each behavior generated a duration of tantrums score. Scores ranged from 12-120. Higher scores indicated a longer duration of tantrums. These scores were plotted and analyzed separately.

### **Overt Aggression Scale**

To measure aggressive behaviors, this study used the Overt Aggression Scale (OAS; Yudofsky, Silver, Jackson, Endicott, & Williams, 1986; see Appendix C). Permission to use the OAS was granted to the researcher for use in this study by Dr. Yudofsky (see Appendix D). The OAS is an objective assessment tool that measures overt displays of physical and verbal aggression. This measure was chosen because it was sensitive to small change over time, and it measured the frequency and intensity of aggressive behaviors. The OAS and modified versions of the scale have been used extensively in the literature to measure aggressive behaviors in a variety of populations (Alderman, Knight, & Morgan, 1997; Colasanti et al., 2008; Oliver, Crawford, Rao, Reece, & Tyrer, 2007; Stone, McMillian, Hazelton, & Clayton, 2011; Su, Tuskan, Tsao, & Pickar, 1995; West, 2003) including individuals with ASD (Cohen et al., 2010; Hellings et al., 2005). The OAS measured four subtypes of aggression: Verbal Aggression, Physical Aggression Against Self, Physical Aggression Against People, and Physical Aggression Against Objects. It also included a category that recorded the intervention used to deal with the behavior. Each category had items that range from mild to severe.

The rater was instructed to record the start and finish time for each episode. Any aggressive behaviors that happen within 30 minutes of each other were counted as a



single episode. The rater marked each behavior that was demonstrated by the individual in the time frame and the intervention that was used to deal with the behavior. Then, a weighted score was given to the most severe behavior and intervention in each category. The OAS aggression score was calculated by adding the weighted scores in each aggression category. This score was used to measure the intensity of the aggressive behaviors. For each week, the OAS aggression score for each aggressive episode during that week were added together and divided by the number of aggressive episodes that week to obtain an average intensity of aggression score for that week. The number of aggressive episodes and the average intensity of aggression score for each week were plotted in a line graph to analyze. Higher scores indicated more frequent and intense aggressive behaviors. Additionally, a total aggression score could be calculated by adding in the weighted score for the intervention. However, it was recommended that the intervention category not be used in outpatient studies involving participants who were observed in home or school settings because the interventional may be different (Hellings et al., 2005). Therefore, this study did not use the intervention category, because most of the items did not apply (i.e., immediate medication given by mouth, immediate medication given by injection, seclusion, and use of restraints). Additionally, the researcher believed it would be unreasonable to ask teachers and parents to stop what they were doing to record the duration of each aggressive episode. Therefore, the raters were not asked to record the duration of the episodes to make the data collection more feasible. Raters were asked to fill out the form once the episode was over and check all items that occurred during the episode. The number of episodes each week was tallied to

calculate the frequency of aggressive behaviors that occurred. The items that were checked were used to calculate the aggression score.

The OAS has been shown to be a valid and reliable measure of aggression (Silver & Yudofsky, 1991; Yudofsky et al., 1986). Silver and Yudofsky (1991) reported an inter-rater reliability of .87. Additionally, a retrospective version of the OAS was found to have test-retest reliability of .96 (Sorgi, Ratey, Knoedler, Markert, & Reichman, 1991). Other modified versions of the OAS have also demonstrated acceptable levels of reliability and validity (Alderman, Knight, & Henman, 2002; Cohen et al., 2010; Endicott, Tracy, Burt, Olson & Corrao, 2002; Kay, Wolkenfeld, & Murrill, 1988; Knoedler, 1989).

### **Procedures**

The materials necessary for the implementation of the Animal Assisted Therapy are addressed first. Also, the procedures for treatment integrity are addressed. Finally, the procedures specific to participant recruitment, data collection, and data analysis are discussed.

### **Materials Specific to Animal Assisted Therapy**

The independent variable in this study was the Animal Assisted Therapy intervention using the Mutt-i-grees Curriculum (Finn-Stevenson, 2010) conducted by a research assistant, a graduate student, and the researcher with the student participants. This intervention was selected because it facilitated children's social and emotional skills development while integrating a trained dog into the lessons. Specifically, the Mutt-i-grees Curriculum is an educational program that built on the research base of emotional intelligence and social-emotional learning to teach children social and emotional skills

through various lesson plans, while highlighting the unique characteristics and needs of mixed breed dogs (Mutt-i-grees). Lesson plans were available for grades Pre-K through 12. This study used the grade 1-3 lesson plans. The curriculum included scripts, strategies, and resources for each lesson. All lessons facilitated the development of social and emotional skills using various activities about dogs. A dog hand puppet could be used as an instructional aide that is integrated throughout the Curriculum. However, therapy dogs could be incorporated into the sessions instead of or in conjunction with the dog puppet. This study used registered therapy dogs from local organizations instead of the dog puppet.

The Mutt-i-grees Curriculum lessons were presented in five units: Achieving Awareness, Finding Feelings, Encouraging Empathy, Cultivating Cooperation, and Dealing with Decisions. The Achieving Awareness unit taught children to become aware of the physical, behavioral, and emotional traits that were unique to them. The unit began by teaching children about Mutt-i-grees and the similarities and differences between people and dogs. The following lessons focused on children identifying traits and interests that made them unique, how they were similar and different from their peers, what traits they had that they were proud of, and what traits they admired about others. These things were also discussed about dogs. The goal of these lessons was for children to accurately assess their interests and abilities in order to reinforce their self-awareness and self-acceptance. Extension lessons taught children how to make effective “I” statements, learn how to use internal self-talk, and identify areas for improvement. Throughout the lessons, the therapy dog was used as an example and for role-playing. For example, when the children were learning about self-talk, the facilitator discussed

different scenarios with them and asked them what the dog might be feeling and what they could say to themselves in each scenario. This allowed the child to practice the skill indirectly. The goal of these lessons was for children to be able to express their wants and needs in an effective and assertive manner and to encourage and self-soothe through self-talk. All of these lessons facilitated children's self-awareness.

The second unit, Finding Feelings, taught children to identify, manage, and communicate emotions. During the initial lesson, children learned about the range of emotions that people experienced and how to identify and label feelings based on physical, behavioral, and situational cues. Later lessons focused on the specific feelings of happiness, anger, and sadness. Children learned they could experience multiple feelings simultaneously and that feelings could change quickly. Extension lessons taught children the varying strength of emotions, how to show feelings appropriately, and strategies to manage feelings and self-soothe. The therapy dog was used as a tool for the child to learn these things indirectly. For example, the children learned how to identify and label feelings of dogs by role playing different scenarios and discussing how the therapy dog may feel. Overall, this unit aimed to increase children's ability to recognize, accurately label, constructively manage, and express emotions.

During the Encouraging Empathy unit, children learned how to take others' perspectives, empathize, and appreciate diversity. The beginning lessons aimed to foster children's ability to use physical, verbal, and situational cues to identify and predict others' feelings and understand that thoughts, feelings, and actions were connected. Additionally, children were taught that mistakes and accidents happened and how to express remorse and make amends. Throughout the lessons, the dog was used as an

example to learn these skills. Through extension lessons, children also learned how to use “I” statements, help others, show they care, and how dogs assist others. The knowledge and skills children learned through these lessons promoted healthy relationships.

The fourth unit, Cultivating Cooperation, sought to enhance children’s ability to establish and maintain relationships that were cooperative and caring. The initial lesson taught children to seek and ask for help in appropriate ways. Following lessons taught children listening skills. Then children learned about friendships and teamwork. Throughout the lessons, the children practiced the skills they learned with the therapy dog. Extension lessons taught children caring compassions, trust, respect, and canine collaborators. The goal of this unit was to teach children about healthy, trusting, and supportive relationships.

Finally, children were taught to solve problems, resolve conflicts, and make decisions in the Dealing with Decisions unit. The lessons taught children about choices and decisions and that their outcomes could be positive or negative. Children learned about decisions by discussing what kind of decisions a person may make regarding their dog. Additionally, children learned about good decisions and strategies to help with decision-making. Making decisions about dogs were discussed during the activities. They were also taught how to manage frustration. During extension lessons, children learned how to manage feelings of disappointment, review decision-making strategies and discuss how the strategies may not always be successful, and learn about the impact their decisions can have on others. Overall, this unit aimed to teach children about

decisions and their consequences so children learn how to prevent conflicts from escalating.

Each unit consisted of five core lessons and three extension lessons. The initial lessons in each unit began with basic concepts of the unit's theme and progress to more complex concepts. The authors of the curriculum stated that each lesson should last approximately 20 minutes. They recommended that the lessons be incorporated into daily school curricula and classroom routines. They did not have a recommendation for how many weeks the lessons should last. If 1 core lesson was taught 1 week, the lessons would last 25 weeks. Each lesson included various types of activities that could be used depending on the students' developmental level. Activities included discussions, role-playing, hands-on activities (e.g., art and writing activities), readings, and learning vocabulary words. Based on the desired outcomes of this study, 17 core lessons and 7 extension lessons were chosen from the 5 units (see Appendix E). The 24 chosen lessons were paired together based on similar content to create 12 one-hour sessions. Since the lessons were based on teaching to a group, they were modified to teach to an individual. Additionally, the Mutt-i-grees puppet was not used, and modifications were made to incorporate the therapy dog into sessions more than the lessons originally intended. Participants were also allowed free time to play with the dog.

There were three certified therapy dogs that were used in this study. The first dog was a 6 year old, female Australian Cattle Dog. She had been a therapy team member for 5 years and had several years of experience working with children. Most of her work as a therapy dog had been in the hospital setting visiting sick and elderly patients. The second dog was a 7 year old, male Standard Poodle. He had been a therapy dog for 3 years,

certified for almost two of those years. He also had experience working in the hospital setting and with seniors. The third dog was a 10 year old, male Labrador Retriever. He had been a therapy team member for over 2 years. He had experience working at colleges, nursing homes, hospitals, day cares, and elementary schools. Participant 1 mainly worked with the first therapy dog. Participant 2 mainly worked with the second therapy dog. Due to scheduling conflicts, there were a few occasions when Participant 1 worked with the second therapy dog and Participant 2 worked with the first therapy dog. During the 12th week, Participant 1 worked with the second therapy dog for two sessions. During the 10th week, Participant 2 worked with the first therapy dog for one session. Participant 3 only worked with the third therapy dog.

To measure treatment integrity, each lesson was videotaped and scripts were provided to the research assistant. The research assistant was trained how to use the scripts by reviewing the components of the scripts and learning what needed to be read and how to do the various activities. The scripts were broken down into multiple sections, including an introduction, discussion, activity, and closing section. Each section had certain components that needed to be addressed during the sessions. The researcher watched the videotaped lessons and tallied the number of components in each section that were implemented with fidelity during the lesson. This number was then be divided by the total number of components in the intervention and multiplied by 100 to give a percentage of components implemented. This method has been shown to be a sufficient way to measure treatment integrity (DiGennaro, Martens, & Kleinmann, 2007; DiGennaro, Martens, & McIntyre, 2005). Treatment integrity was measured for all lessons. To combine the percentages for each lesson, the percentages were added

together and divided by the number of lessons. This gave an average percentage for treatment integrity for each participant.

### **Pre-data Collection Procedures**

Permission to work with human participants was obtained from the university's Institutional Review Board (IRB; see Appendix F). Additionally, permission to work with animals was determined not to be needed from the university's Institutional Animal Care and Use Committee (IACUC) since the research in this study was not conducted on animals. Upon approval from the IRB, the researcher solicited participants via local elementary schools, autism groups, and mental health professionals who work with children with autism in a metropolitan area. Information about this study, a flyer, and contact information were given to the people contacted to give to anyone they thought would be interested in the study. Then, parents of the potential participants would contact the researcher by phone or email. The researcher gathered information from the parents and answered any questions they had. If parents were interested in having their child participate in the study, parents were asked to answer questions regarding demographic information, ASD diagnosis and symptoms, tantrum and aggressive behaviors, fear of dogs, aggression towards animals, and animal allergies. Once it was determined that the child qualified for participation in the study, the parents received and signed a consent form that contained the purpose of the study, a brief description of the study, procedures to maintain confidentiality, and the risks and benefits of participation.

If the participants did not meet the requirements, additional participants were solicited for the study until three participants were enrolled. Each participant was given a number to ensure confidentiality. The researcher and a graduate research assistant, a



master's student in counseling, were the only ones who had access to identifying information. The participant selection process resulted in three kindergarten-second grade students with a diagnosis of ASD who frequently demonstrated emotional dysregulation that presented as tantrum and aggressive behaviors, had average cognitive scores, were not allergic to animals, did not have a fear of dogs, and did not have a history of being aggressive towards animals.

Participant 1 was a first grade Caucasian boy who often had tantrum and aggressive behaviors at home. He was referred to as Adam in this study. His behaviors often presented as screaming, kicking, slamming doors, running away, and yelling insults. Becoming overwhelmed, noises, and becoming frustrated often triggered these behaviors. He received an educational diagnosis when he was 3 years old through Child Find. A licensed psychologist medically diagnosed him when he was 6 years old. He also had a Sensory Processing Disorder diagnosis. His recent cognitive scores were in the average range. He had two pet dogs at home.

Participant 2 was a second grade Caucasian boy who often had tantrum and aggressive behaviors at home and school. He was referred to as Bob in this study. His behaviors often presented as screaming, hitting, kicking, throwing things, and sometimes biting. These behaviors were often triggered by not getting what he wanted, loud noises, and things not working the way he anticipated they should. He was diagnosed with Autism Spectrum Disorder when he was 3 years old by a neuropsychologist. He did not have any other medical conditions. Recent cognitive scores showed an average cognitive ability. He did not have any dogs at home.

Participant 3 was a kindergarten Caucasian boy who often had tantrum and aggressive behaviors at home and school. He was referred to as Carter in this study. His behaviors often presented as yelling, hitting, and kicking. These behaviors were often triggered by requests to comply with directions. A physician who specialized in Autism Spectrum Disorder diagnosed him with ASD when he was 3 years old. He did not have any other medical conditions. A recent cognitive assessment indicated an average cognitive ability. He had a pet dog at home.

### **Baseline Procedures**

After the participants were selected, the teachers and parents were taught how to use the Temper Tantrum Grid and the OAS. Then, the parents and researcher decided when the data collection would begin and where, what days of the week, and what time the intervention would take place. On the agreed upon date, the teachers and parents began completing the Temper Tantrum Grid on a weekly basis and the OAS after every aggressive episode. The participants' parents and teachers did not start collecting baseline data at the same time. The data from the Temper Tantrum Grid and the OAS was used to determine the frequency, intensity, and duration of the participants' tantrums and the frequency and intensity of the participants' aggressive behaviors before the intervention was implemented. The data were displayed in a graph and analyzed for stability.

### **Intervention Procedures**

After 5 weeks of baseline data, the researcher analyzed the data for stability. Adam began the intervention after 5 weeks of baseline data. Bob began the intervention after 7 weeks of baseline data. Carter began the intervention after 8 weeks of baseline

data. Adam received all 12 sessions over 7 weeks. Bob received all 12 sessions over 8 weeks. Carter received all 12 sessions over 6 weeks. The sessions were conducted in a room at a local community center. Each session ran for approximately 45-60 minutes. Throughout the intervention, the teachers and parents continued to collect data using the Temper Tantrum Grid and the OAS form in the same manner they did during the baseline phase. There were some weeks when the data was not collected due to a number of reasons. Specifically, there was no data for Adam's 12th week because he did not have school. During Bob's sixth and seventh weeks, his mother was out of town and his father completed the rating scales. Additionally, Bob was sick during his fifth and seventh weeks so there was no teacher data for those weeks. Bob's parent did not turn in the Temper Tantrum Grid for the final week and his teacher did not turn in the rating scales for weeks 14 and 15. Carter did not have school during his sixth and seventh week so there was no teacher data for those weeks.

### **Data Analysis**

The data were primarily analyzed using standard single-case design visual analysis. The researcher compared the individual participant's baseline and intervention data. The first dimension that was analyzed was the level of the data. This referred to the mean of the data within a condition. Next, the trend of the data was analyzed. Trend referred to the best-fit straight line that could be fit over the data within a condition. The slope and magnitude of the trend was simultaneously evaluated. Finally, the variability of the data was analyzed. Variability referred to the degree to which individual data points deviated from each other. The level, trend, and variability were compared across the phases to visually analyze the data.

Additionally, the Percentage of Non-overlapping Data (PND) and the Improvement Rate Difference (IRD) was calculated to determine effectiveness. The PND calculates the percentage of data points between the baseline and intervention phase that do not overlap. For this study, the number of data points in the intervention phase that were below the lowest data point in the baseline phase was calculated. Usually, the greater percentage of data points that did not overlap indicates a larger effect. Percentage of Non-overlapping Data scores less than 50% were considered ineffective, scores between 50-70% were mildly effective, scores between 70-90% were moderately effective, and scores greater than 90% were highly effective (Scruggs & Mastropieri, 1994).

The IRD calculates the difference between the improvement rate in the intervention phase and the baseline phase. To calculate the IRD, the fewest number of data points were removed from the baseline and intervention phase to eliminate overlapping data. Then, the number of improved data points for each phase was divided by the total data points in that phase. Any data point in the baseline phase that tied or exceeded any data point in the intervention phase was considered an improved data point for the baseline phase. Any data point in the intervention phase that tied or exceeded all data points in the baseline phase was considered an improved data point for the baseline phase. For this study, “exceeds” referred to lower data points. The percentage of improved data points in the baseline phase was subtracted from the percentage of improved data points in the intervention phase. Improvement Rate Difference scores less than 50% were considered very small and questionable effects, scores between 50-70%

were moderately effective, and scores greater than 70% were largely effective (Parker, Vannest, & Brown, 2009).

To calculate inter-assessor agreement, the researcher and research assistant scored and compared the rating scales. Kratochwill et al. (2010) recommended collection of inter-assessor agreement for 20% of the data points in each phase. Therefore, inter-assessor agreement was calculated for two data points in each phase for each participant. This study used percentage agreement. Inter-assessor agreement above .80 was considered acceptable (Hartmann, Barrios, & Wood, 2004).

### **Research Questions**

- Q1 Will kindergarten children diagnosed with Autism Spectrum Disorder who participate in Animal Assisted Therapy show a decrease in the frequency, as measured weekly by a 5-point Likert-type scale on the Temper Tantrum Grid, of tantrum behaviors?

It was hypothesized that each participant would show a significant change in the frequency of these behaviors, from a high rate during baseline, to a steep, downward trend (indicating decreased behaviors) during the intervention condition.

- Q2 Will kindergarten children diagnosed with Autism Spectrum Disorder who participate in Animal Assisted Therapy show a decrease in the intensity, as measured weekly by a 4-point Likert-type scale on the Temper Tantrum Grid, of tantrum behaviors?

It was hypothesized that each participant would show a significant change in the intensity of these behaviors, from a high rate during baseline, to a steep, downward trend (indicating decreased behaviors) during the intervention condition.

- Q3 Will kindergarten children diagnosed with Autism Spectrum Disorder who participate in Animal Assisted Therapy show a decrease in the duration, as measured weekly by a 10-point Likert-type scale on the Temper Tantrum Grid, of tantrum behaviors?

It was hypothesized that each participant would show a significant change in the duration of these behaviors, from a high rate during baseline, to a steep, downward trend (indicating decreased behaviors) during the intervention condition.

- Q4 Will kindergarten children diagnosed with Autism Spectrum Disorder who participate in Animal Assisted Therapy show a decrease in the frequency, as measured daily on the OAS, of aggressive behaviors?

It was hypothesized that each participant would show a significant change in the frequency of these behaviors, from a high rate during baseline, to a steep, downward trend (indicating decreased behaviors) during the intervention condition.

- Q5 Will kindergarten children diagnosed with Autism Spectrum Disorder who participate in Animal Assisted Therapy show a decrease in the intensity, as measured by the OAS aggression score for each aggressive episode, of aggressive behaviors?

It was hypothesized that each participant would show a significant change in the intensity of these behaviors, from a high rate during baseline, to a steep, downward trend (indicating decreased behaviors) during the intervention condition.

## **CHAPTER IV**

### **RESULTS**

The purpose of this study was to closely examine the effects of Animal Assisted Therapy sessions on the emotional regulation of children who had a diagnosis of Autism Spectrum disorder. Specially, this study examined whether or not incorporating a therapy dog into social emotional therapy sessions decreased children with autism's tantrum and aggressive behaviors. To examine this hypothesis, a single-case, non-concurrent multiple-baseline-across-participants design was used. The research questions were answered by using standards single-case visual analysis and by calculating the Percentage of Non-overlapping Data (PND) and the Improvement Rate Difference (IRD). This chapter includes a review of the research questions and the respective results.

Some data were missing due to events that were beyond the researcher's control. There was no teacher data for Adam's week 12 because the teacher was gone that week. For Bob, there was no parent Temper Tantrum Grid data for week 15. Additionally, there are no weeks 5, 7, 14, or 15 teacher data because the student was sick a couple of the weeks and the teacher did not complete the rating scales the last 2 weeks. Carter did not have school during weeks 6 and 7. Therefore, there were no teacher data for those weeks. Additionally, Adam and Bob switched therapy dogs during certain weeks. Adam used Bob's therapy dog during the 12th week and Bob used Adam's therapy dog during the 10th week. These changes are noted with black triangle markers on the graphs.

The first 2 weeks of the parent data for Bob were not calculated into the trend line, mean, range, PND, or IRD for any variable because they were outliers that skewed the data. For Carter, the fourth week of the baseline data for the duration of tantrums at school was removed from the calculations because it was an outlier. Aguinis, Gottfredson, and Joo (2013) stated that removing the outliers was one handling technique for outliers. Additionally, the data were sufficient and stable after the two outliers were removed indicating that the last data points accurately captured the tantrums and aggressive behaviors at baseline.

There were also some other issues with the data. Specifically, some of the data occurred at lower rates than was expected. This would indicate that there was no need for an intervention for these variables. Additionally, some of the data had high levels of variability during the baseline phase, which reduced the amount of affect that could be observed. Finally, some of the baseline trends were decreasing indicating that the variable was improving before the intervention. These concerns need to be taken into consideration when interpreting the findings.

### **Treatment Integrity**

To ensure that the participants received the same intervention, treatment integrity was measured for each participant. The Animal Assisted Therapy sessions were recorded and reviewed. A checklist was used to measure the percentage of components that were implemented during each session. For Adam, the protocol was adhered 95% of the time. Treatment integrity for Bob was 88%. The protocol was implemented 96% of the time for Carter. Overall, the Animal Assisted Therapy was implemented with a high rate of fidelity.



### **Interobserver Agreement**

Interobserver agreement was calculated for each dependent variable. Two data points from both the baseline and intervention phase were reviewed for each participant. For Bob, interobserver agreement ranged from 86% to 100% for each dependent variable during the baseline phase. During the intervention phase, interobserver agreement was 100% on all dependent variables. Interobserver agreement for Adam was 100% for all dependent variables in each phase. For Carter, interobserver agreement was also 100% for all of the dependent variables in each phase.

### **Frequency of Tantrum Behaviors**

The first research question was: Will kindergarten children diagnosed with Autism Spectrum Disorder who participate in Animal Assisted Therapy show a decrease in the frequency, as measured weekly by a 5-point Likert-type scale on the Temper Tantrum Grid, of tantrum behaviors? It was hypothesized that there would be a significant change in the frequency of tantrum behaviors, from a high rate during baseline, to a steep, downward trend (indicating decreased behaviors) during the intervention condition.

Visual analysis results for the frequency of tantrum behaviors at home showed that the baseline trend was decreasing with some variability for each participant. See Figure 1 for the graph and Table 1 for the results. During the intervention phase, the data showed immediate improvement for Adam that remained throughout the intervention, indicating an improvement in frequency of tantrum behaviors at home. There were no significant improvements in the level, trend, and variability for Bob and Carter. Visual

analysis suggested that the intervention did not decrease the frequency of tantrum behaviors at home.

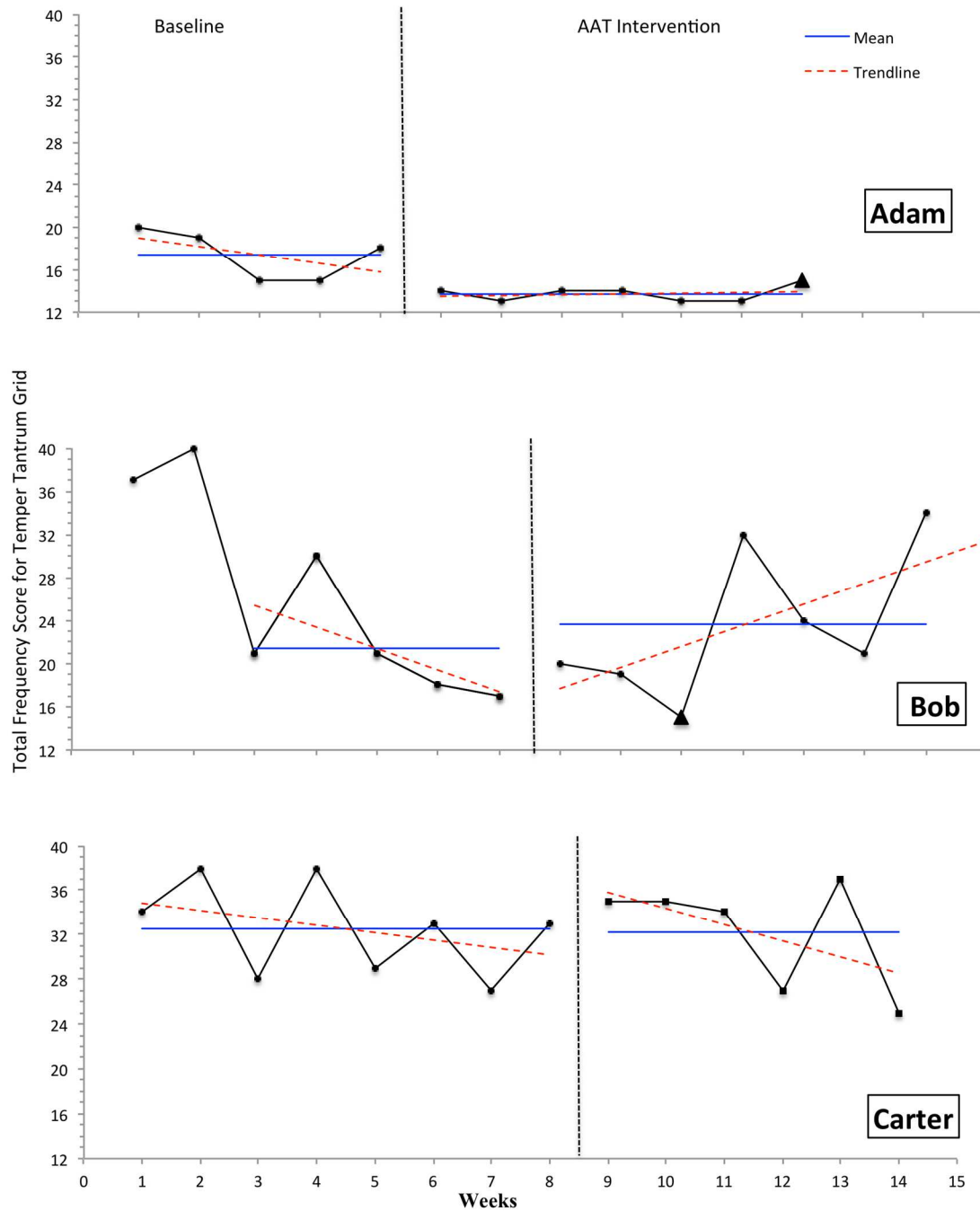


Figure 1. Frequency of Tantrum Behaviors at Home

Table 1

*Results of Frequency of Tantrum Behaviors at Home*

Participant	Mean		Trend		PND	IRD
	Baseline	Intervention	Baseline	Intervention		
Adam	17.4	13.7	Decreasing Slightly	None	86%	86%
Bob	21.4	23.6	Decreasing	Increasing	14%	14%
Carter	32.5	32.2	Decreasing Slightly	Decreasing Slightly	17%	-25%

*Note:* PND = Percentage of Non-overlapping Data; IRD = Improvement Rate Difference

Unexpectedly, the frequency of tantrums at school started at a very low rate with no trend for Adam, indicating that tantrums were not frequent at school during the baseline phase. Bob had a decreasing trend, with a high amount of variability during the baseline phase. The data indicated that Bob either had no tantrums or a high frequency of tantrums at school. Carter had a high frequency of tantrums at school, with a slightly decreasing trend, and a high amount of variability during the baseline. See Figure 2 for the graph and Table 2 for the results. During the intervention phase, none of the participants showed improvements in the frequency of tantrum behaviors at school.

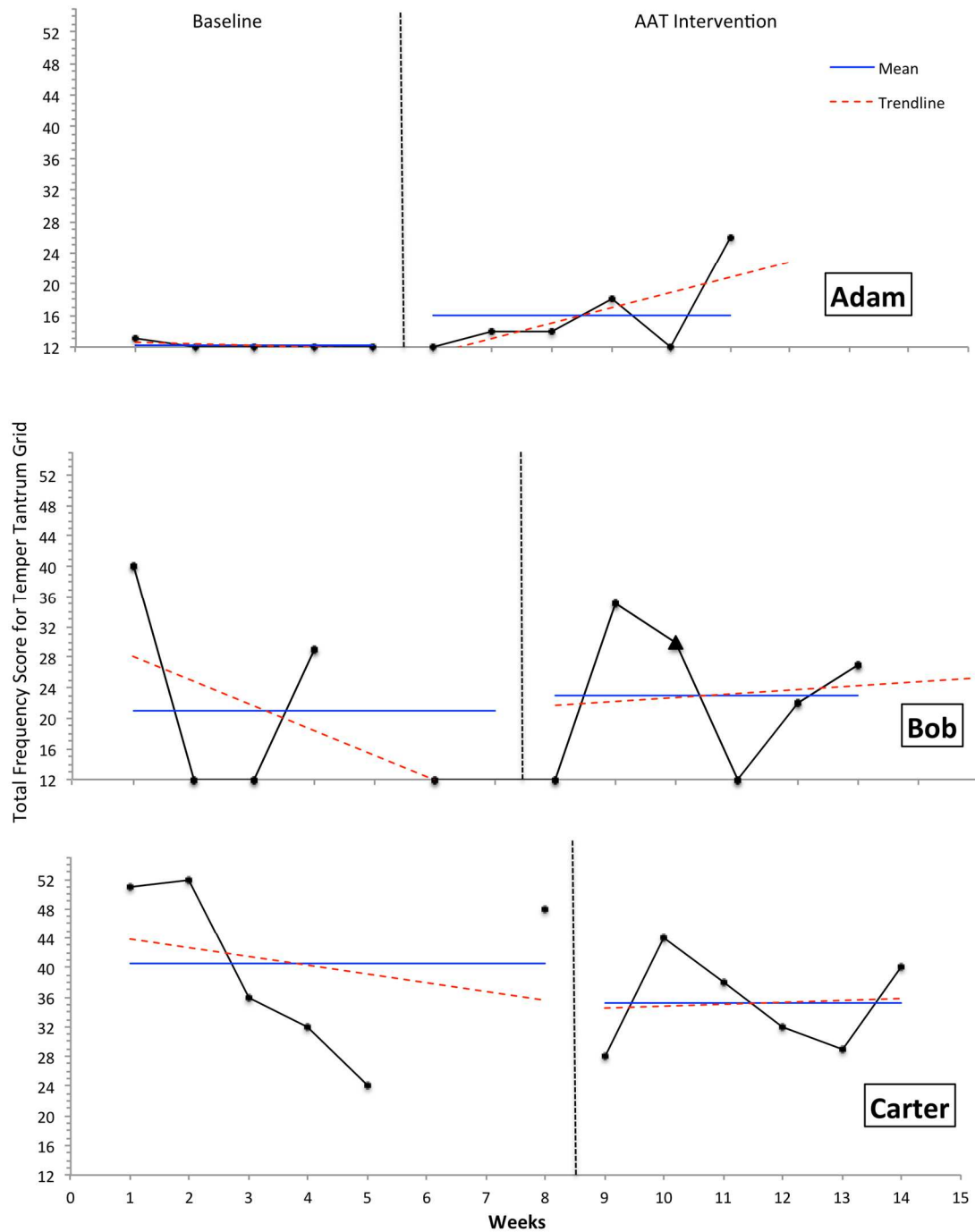


Figure 2. Frequency of Tantrum Behaviors at School

Table 2

*Results of Frequency of Tantrum Behaviors at School*

Participant	Mean		Trend		PND	IRD
	Baseline	Intervention	Baseline	Intervention		
Adam	12.2	16.0	None	Increasing	0%	-67%
Bob	21.0	23.0	Decreasing	None	0%	-27%
Carter	40.5	35.2	Decreasing Slightly	None	0%	50%

*Note:* PND = Percentage of Non-overlapping Data; IRD = Improvement Rate Difference

The PND and IRD were calculated for each participant. The PND for the parent data for each participant were as follows: Adam: 86%, Bob: 14%, and Carter: 17%. The PND indicated that the intervention was moderately effective in improving the frequency of tantrum behaviors at home for Adam but not effective for Bob and Carter. The PND for the teacher data were 0% for each participant indicating that the intervention did not improve tantrum behaviors at school. The IRD for the parent data were as follows: Adam: 86%, Bob: 14%, and Carter: -25%. The IRD for the school data for Adam was -67% indicating that the intervention had a moderately negative effect. The IRD for the school data were -27% for Bob and 50% for Carter. Similar to the visual analysis and PND, the IRD suggested that the intervention was effective for improving the frequency of tantrums at home for Adam but did not improve the frequency of tantrums at home for Bob and Carter and at school for all participants.

Overall, the intervention decreased the frequency of tantrum behaviors for Adam at home but not at school. In fact, the data indicated that the intervention may have

increased the frequency of tantrum behaviors at school for Adam. The intervention did not decrease the frequency of tantrum behaviors at home or school for Bob or Carter. Overall, the data indicated that Animal Assisted Therapy did not decrease the frequency of tantrum behaviors for these participants.

### **Intensity of Tantrum Behaviors**

The second research question was: Will kindergarten children diagnosed with Autism Spectrum Disorder who participate in Animal Assisted Therapy show a decrease in the intensity, as measured weekly by a 4-point Likert-type scale on the Temper Tantrum Grid, of tantrum behaviors? It was hypothesized that each participant would show a significant change in the intensity of tantrum behaviors, from a high rate during baseline, to a steep, downward trend (indicating decreased behaviors) during the intervention condition.

Visual analysis revealed that the trend during baseline was decreasing slightly for Adam and Carter and increasing slightly for Bob. Bob and Carter had low amounts of variability, whereas Adam had a high amount of variability. See Figure 3 for graphs and Table 3 for the results. During the intervention phase, the trend remained the same for Bob and Carter and stabilized for Adam. Adam's mean reduced slightly. The variability also reduced for Adam. The mean and variability increased for Bob. For Carter, the mean lowered but the variability increased. Overall, visual analysis showed that there was slight improvement of intensity of tantrum behaviors at home for Adam and Carter but no improvements for Bob.

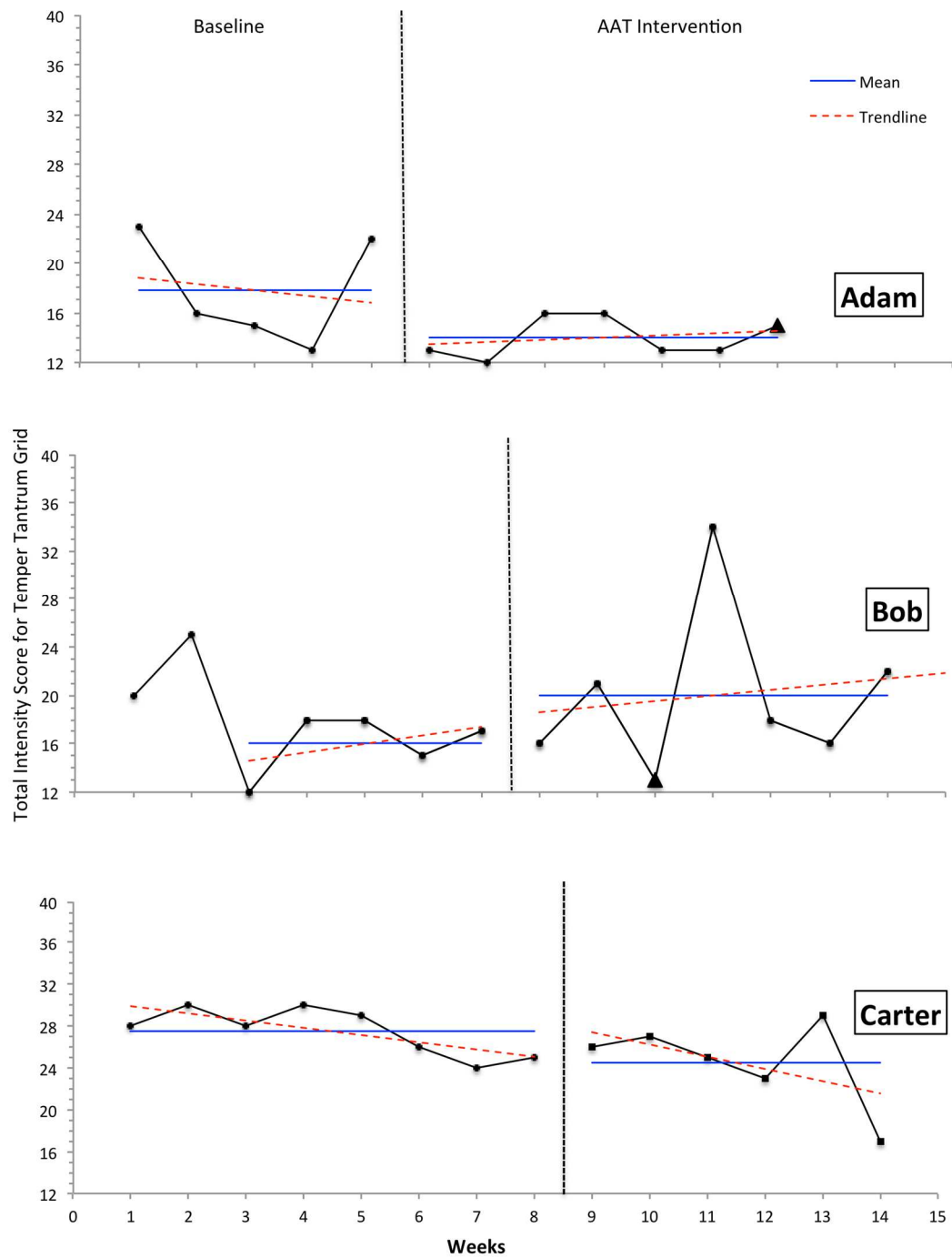


Figure 3. Intensity of Tantrum Behaviors at Home

Table 3

*Results of Intensity of Tantrum Behaviors at Home*

Participant	Mean		Trend		PND	IRD
	Baseline	Intervention	Baseline	Intervention		
Adam	17.8	16.0	Decreasing Slightly	None	14%	37%
Bob	16.0	20.0	Increasing Slightly	Increasing Slightly	0%	-43%
Carter	27.5	24.5	Decreasing Slightly	Decreasing	17%	33%

*Note:* PND = Percentage of Non-overlapping Data; IRD = Improvement Rate Difference

Unexpectedly, the intensity of tantrum behaviors at school occurred at a low rate during the baseline phase for Adam. For Bob and Carter, the intensity varied greatly during the baseline phase. The data indicated that the intensity was either very low or very high. Bob and Carter's trends were decreasing during the baseline phase. See Figure 4 for the graphs and Table 4 for the results. During the intervention phase, all participants had increasing trends suggesting that the intensity of tantrums behaviors were increasing during the intervention phase. The mean increased for Adam and Bob but decreased slightly for Adam. Visual analysis indicated that the intervention did not decrease the intensity of tantrum behaviors at school for any of the participants.



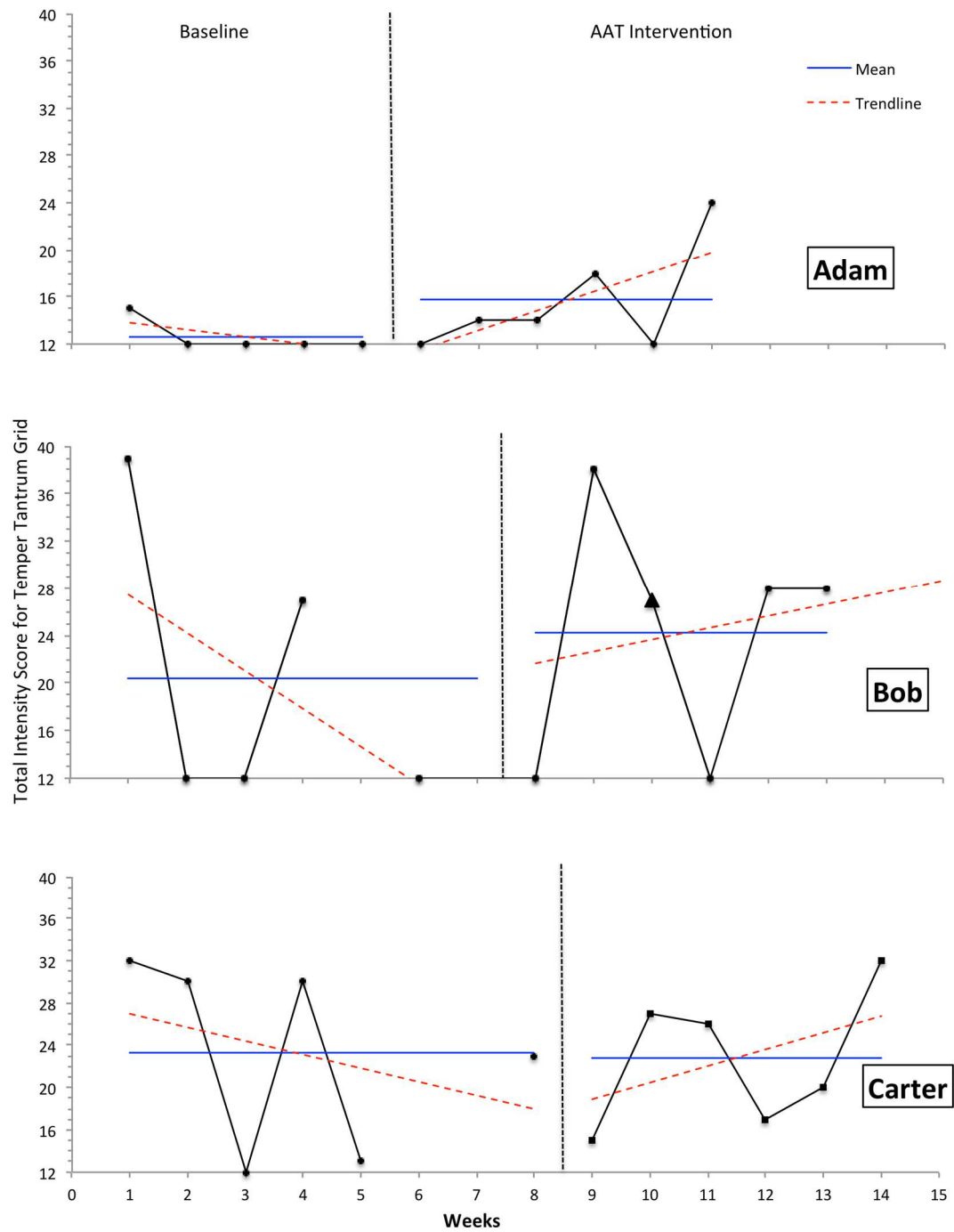


Figure 4. Intensity of Tantrum Behaviors at School

Table 4

*Results of Intensity of Tantrum Behaviors at School*

Participant	Mean		Trend		PND	IRD
	Baseline	Intervention	Baseline	Intervention		
Adam	12.6	15.7	None	Increasing	0%	-47%
Bob	20.4	24.2	Decreasing	Increasing Slightly	0%	-30%
Carter	23.3	22.8	Decreasing	Increasing	0%	33%

*Note:* PND = Percentage of Non-overlapping Data; IRD = Improvement Rate Difference

The PND and IRD were calculated for each participant. The parent data PND were as follows: Adam: 14%, Bob: 0%, and Carter: 17%. On the teacher's data, the PND was 0% for all participants. The PND for both the parent and teacher data indicated that the intervention was ineffective for decreasing the intensity of the participant's tantrum behaviors. The IRD for the parent data were 37% for Adam, -43% for Bob, and 33% for Carter. For the school data, the IRD were -47% for Adam, -30% for Bob, and 33% for Carter. The IRD also indicated that the intervention was ineffective for decreasing the intensity of the participant's tantrum behaviors at home and school.

Overall, visual analysis indicated that there was a mild improvement on the intensity of tantrum behaviors at home for Adam and Bob. However, the PND and IRD did not support these findings. The results showed no improvement on the intensity of tantrum behaviors at home for Carter. At school, visual analysis indicated that there was a mild negative effect on the intensity of tantrum behaviors. The PND and IRD did not show a negative effect. Visual analysis, the PND, and the IRD did not show any effects

on the variable at school for Bob or Carter. Overall, the results indicate that Animal Assisted Therapy is ineffective for decreasing the intensity of tantrum behaviors.

### **Duration of Tantrum Behaviors**

The third research question was: Will kindergarten children diagnosed with Autism Spectrum Disorder who participate in AAT show a decrease in the duration, as measured weekly by a 10-point Likert-type scale on the Temper Tantrum Grid, of tantrum behaviors? This study hypothesized that each participant would show a significant change in the duration of tantrum behaviors at home and school, from a high rate during baseline, to a steep, downward trend (indicating decreased behaviors) during the intervention condition.

Visual analysis of the duration of tantrum behaviors at home during baseline indicated that for each participant the data were close to having no trends. See Figure 5 for the graph and Table 5 for the results. Adam had some variability, whereas, Bob and Carter had little variability. During the intervention phase, the mean and variability reduced for Adam indicating some improvements in the duration of tantrum behaviors at home. Carter's mean and trend decreased, which also indicated some improvements in the variable. Bob's mean, variability, and trend increased during the intervention phase suggesting that the intervention was not effective.

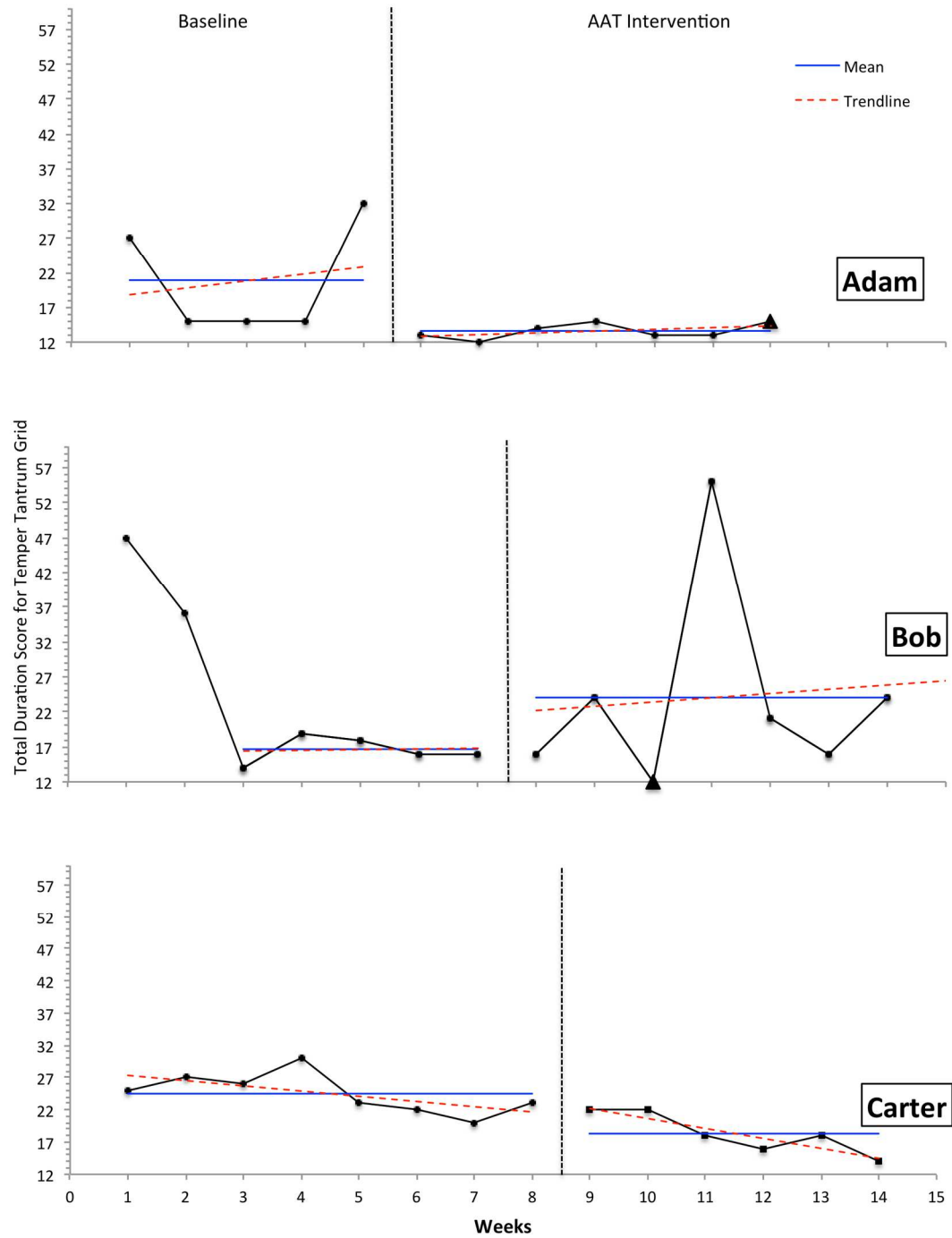


Figure 5. Duration of Tantrum Behaviors at Home

Table 5

*Results of Duration of Tantrum Behaviors at Home*

Participant	Mean		Trend		PND	IRD
	Baseline	Intervention	Baseline	Intervention		
Adam	20.8	15.6	Increasing Slightly	None	71%	71%
Bob	16.6	24.0	None	Increasing Slightly	14%	-57%
Carter	24.5	18.3	Decreasing Slightly	Decreasing	67%	67%

*Note:* PND = Percentage of Non-overlapping Data; IRD = Improvement Rate Difference

The duration of tantrums at school occurred at an unexpectedly low rate during the baseline phase for Adam. Bob also had a few weeks of unexpectedly low duration rates during the baseline phase. Carter had some variability with a decreasing trend. See Figure 6 for the graphs and Table 6 for the results. During the intervention phase, all participants had increasing trends. Adam's and Bob's means and variability also increased. Carter's intervention mean and variability remained similar to the baseline phase. The data indicated that the intervention did not reduce the duration of tantrum behaviors at school.

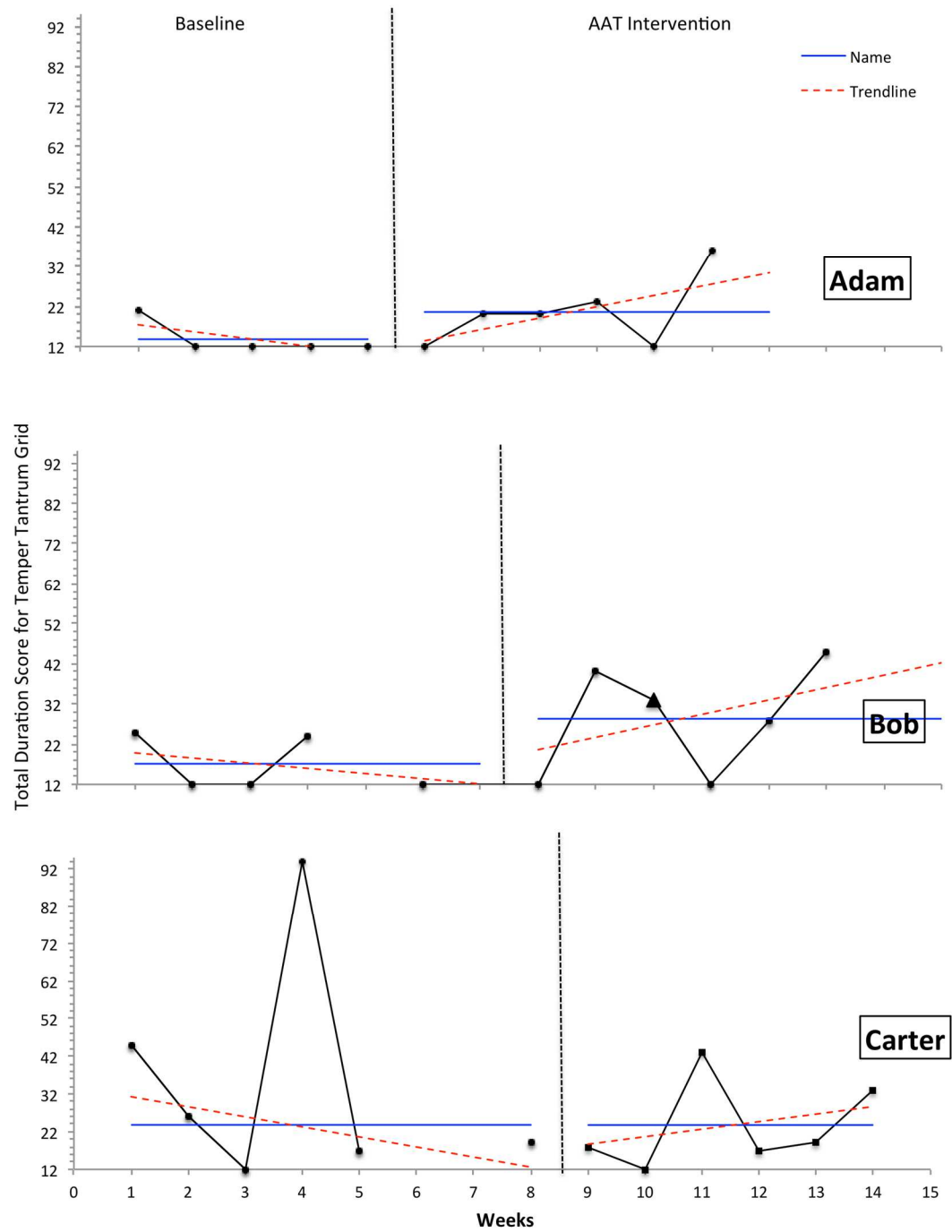


Figure 6. Duration of Tantrum Behaviors at School

Table 6

*Results of Duration of Tantrum Behaviors at School*

Participant	Mean		Trend		PND	IRD
	Baseline	Intervention	Baseline	Intervention		
Adam	13.8	20.5	None	Increasing	0%	-47%
Bob	17.0	28.3	Decreasing Slightly	Increasing	0%	-67%
Carter	23.8	23.7	Decreasing Slightly	Increasing	0%	10%

*Note:* PND = Percentage of Non-overlapping Data; IRD = Improvement Rate Difference

The PND and IRD were calculated for each participant. The parent data PND were 71% for Adam, 14% for Bob, and 67% for Carter. The teacher data PND were 0% for all participants. The PND indicated that the intervention was moderately effective for Adam and mildly effective for Carter for reducing the duration of tantrums at home. However, the PND suggested that the intervention did not reduce the duration of tantrums at home for Bob or at school for any of the participants. The parent data IRD were 71% for Adam, -57% for Bob, and 67% for Carter. For the teacher data, the IRD were -47% for Adam, -67% for Bob, and 10% for Carter. For Adam, the IRD suggested that the intervention was largely effective at home and ineffective at school. The IRD indicated that the intervention had a moderately negative effect on the duration of tantrum behaviors at home and school for Bob. For Carter, the IRD also indicated that the intervention was moderately effective for improving the duration of the variable at home but not at school.

Overall, the results indicated that the intervention was effective for decreasing the duration of tantrum behaviors at home Adam. However, the intervention was ineffective for decreasing the duration of Adam's tantrums at school. The intervention appeared to have a negative effect on the duration of Bob's tantrums at home and school, indicating that the duration increased during the intervention. For Carter, the intervention was effective for decreasing the duration of tantrums at home but not at school. Overall, the results indicated that the intervention may decrease the duration of tantrum behaviors at home.

### **Frequency of Aggressive Behaviors**

The fourth research question was: Will kindergarten children diagnosed with Autism Spectrum Disorder who participate in Animal Assisted Therapy show a decrease in the frequency, as measured daily on the OAS, of aggressive behaviors? It was hypothesized that each participant would show a significant change in the frequency of aggressive behaviors, from a high rate during baseline, to a steep, downward trend (indicating decreased behaviors) during the intervention condition.

For frequency of aggressive behaviors, visual analysis of Adam's baseline data showed a decreasing trend on the home rating scales with the last three data points fairly stable. Bob and Carter did not have any trends during baseline and had very little variability. See Figure 7 for the graph and Table 7 for the results. During the intervention phase, there were no trends for any participants. Adam's mean decreased slightly, but Bob and Carter's means increased. Bob's variability also increased during the intervention phase. Visual analysis indicated that the intervention was mildly



effective for decreasing the frequency of aggressive behaviors at home for Adam but not for Bob or Carter.

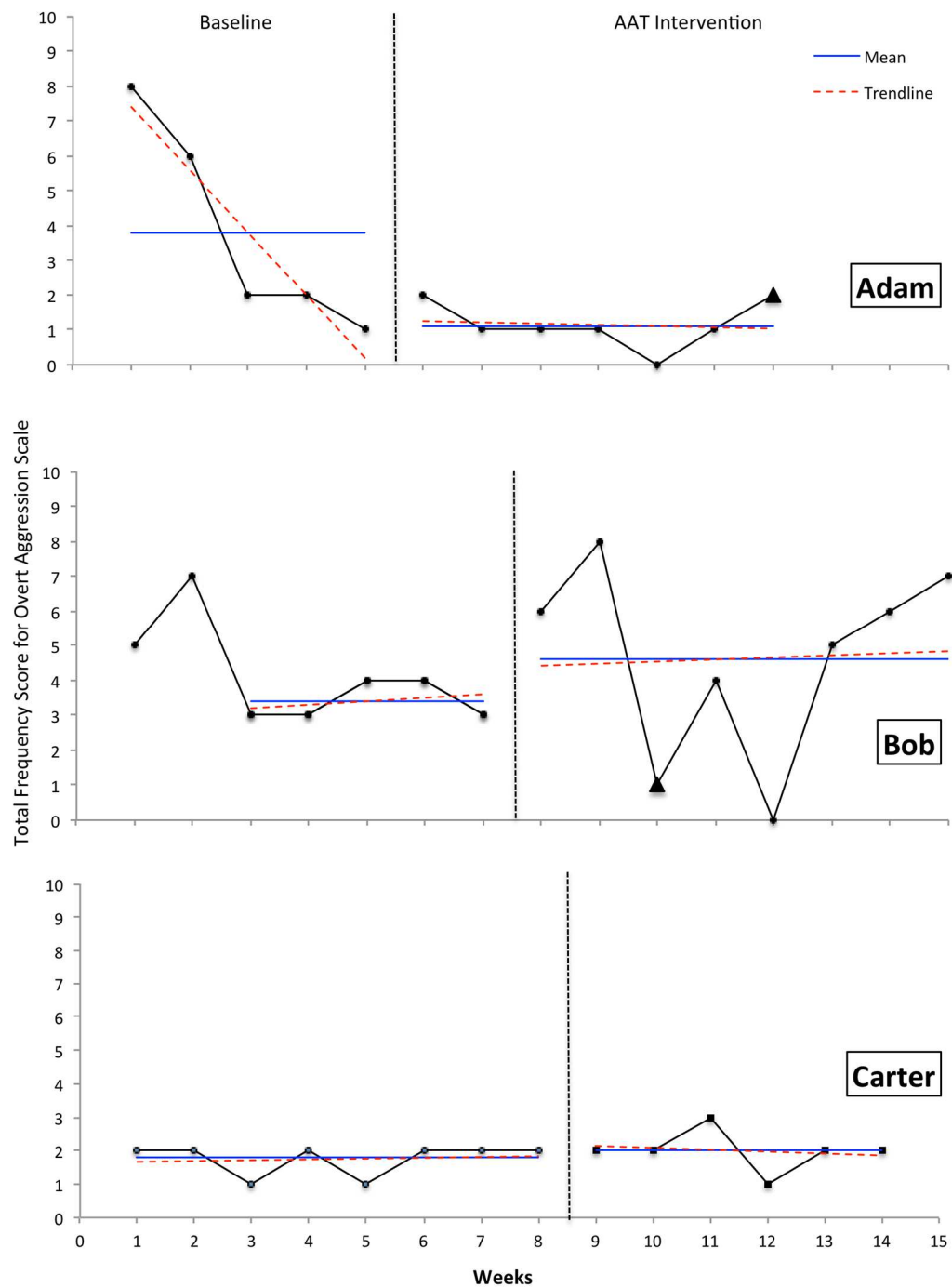


Figure 7. Frequency of Aggressive Behaviors at Home



Table 7

*Results of Frequency of Aggressive Behavior at Home*

Participant	Mean		Trend		PND	IRD
	Baseline	Intervention	Baseline	Intervention		
Adam	3.8	1.1	Decreasing	None	57%	51%
Bob	3.4	4.6	None	None	25%	-62%
Carter	1.8	2.0	None	None	0%	0%

*Note:* PND = Percentage of Non-overlapping Data; IRD = Improvement Rate Difference

Unexpectedly, the frequency of aggressive behaviors occurred at a low rate at school for Adam. There was no trend during his baseline phase. Bob's and Carter's trends were decreasing slightly. Similar to the other variables, Bob either had no aggressive behaviors or a high amount of aggressive behaviors at school during the week. See Figure 8 for the graph and Table 8 for the table. There were no significant changes in the mean or variability for any of the participants. The trends changed to increasing slightly for Adam, increasing for Bob, and no trend for Carter. Overall, visual analysis suggested that the intervention did not decrease the frequency of aggressive behaviors at school.

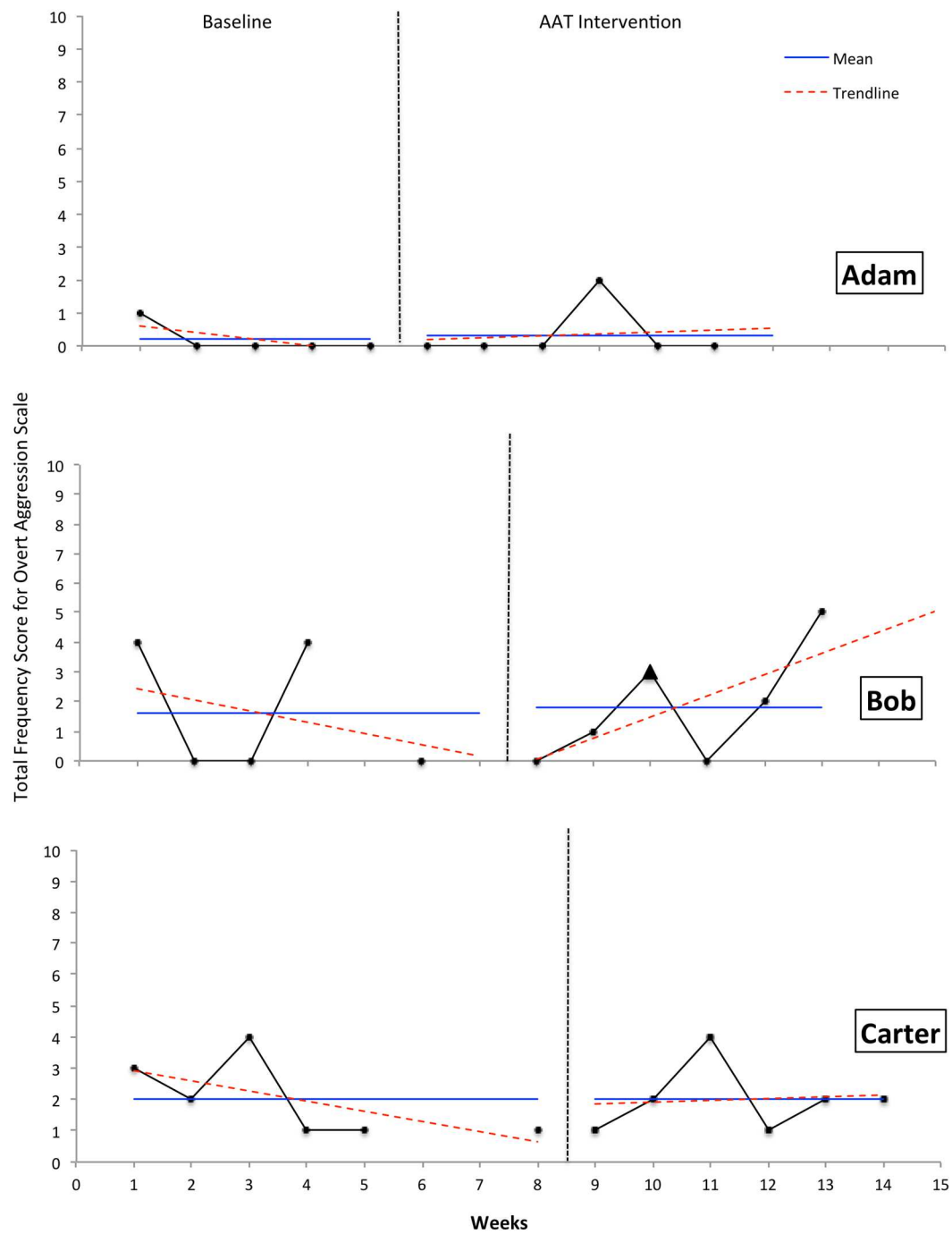


Figure 8. Frequency of Aggressive Behaviors at School



Table 8

*Results of Frequency of Aggressive Behaviors at School*

Participant	Mean		Trend		PND	IRD
	Baseline	Intervention	Baseline	Intervention		
Adam	0.2	0.3	None	Increasing	0%	0%
Bob	1.6	1.8	Decreasing Slightly	Increasing	0%	-27%
Carter	2.0	2.0	Decreasing Slightly	None	0%	0%

*Note:* PND = Percentage of Non-overlapping Data; IRD = Improvement Rate Difference

The PND and IRD were calculated for each participant. The parent data PND were as follows: Adam: 57%, Bob: 25%, and Carter 0%. The PND for the teacher data were 0% for all participants. For Adam, the PND indicated that the intervention was mildly effective at home but not at school. The PND also indicated that the intervention was not effective for decreasing the frequency of aggressive behaviors at home for Bob and Carter and at school for all participants. The IRD for the parent data were 51% for Adam, -62% for Bob, and 0% for Carter. The IRD suggested that the intervention was moderately effective for decreasing the frequency of aggressive behaviors at home for Adam. For Bob, the IRD indicated that the intervention had a moderately negative effect on the frequency of aggression at home. Additionally, the IRD showed that the intervention had no effect on the frequency of aggressive behaviors for Carter. The IRD for the parent data were 0% for Adam, -27% for Bob, and 0% for Carter. The IRD suggested that the intervention did not decrease the frequency of tantrum behaviors at school for any of the participants.

Overall, the results showed that the intervention had a small effect on the frequency of aggressive behaviors at home for Adam but not at school. The intervention was not effective for decreasing the frequency of aggressive behaviors for Bob or Carter. The IRD for Bob's at school behaviors indicated that the intervention may have had a negative effect on the variable. Overall, the results indicated that Animal Assisted Therapy did not decrease the frequency of aggressive behaviors.

### **Intensity of Aggressive Behaviors**

The final research question was: Will kindergarten children diagnosed with Autism Spectrum Disorder who participate in AAT show a decrease in the intensity, as measured by the OAS aggression score for each aggressive episode, of aggressive behaviors? This study hypothesized that each participant would show a significant change in the intensity of aggressive behaviors, from a high rate during baseline, to a steep, downward trend (indicating decreased behaviors) during the intervention condition.

Visual analysis of the baseline data indicated that there were no trends for Adam or Bob. Carter had a decreasing trend during the baseline. All participants had minimal variability. See Figure 9 for the graph and Table 9 for the results. During the intervention phase, Adam showed immediate improvement. His first three data points were lower than any of the data points in his baseline phase. However, the following data points increased, which caused the trend to become increasing. His intervention mean was lower than his baseline mean. For Bob, the first three data points increased during the intervention phase. His mean also increased. However, his intervention trend was decreasing slightly because the intensity of his aggressive behaviors began to decrease

towards the end of the intervention phase. Carter's mean decreased slightly during the intervention phase, but there was no trend. Overall, visual analysis indicated that the intervention was ineffective for improving the intensity of aggressive behaviors at home.

At school, the intensity of aggressive behaviors was unexpectedly low for Adam. Bob had a decreasing trend and Carter had no trend. Bob and Carter both had high amounts of variability during their baseline phase. See Figure 10 for graphs and Table 10 for results. During the intervention phase, Adam and Bob had increasing trends and Carter had no trend. The intervention mean increased for Adam and Bob but decreased for Carter. The data suggested that the intervention was not effective for decreasing the intensity of aggressive behaviors at school for Adam and Bob, but slightly effective for Carter.

The PND and IRD were calculated for each participant. The PND for the parent data were as follows: Adam: 57%, Bob: 13%, and Carter: 17%. The PND for the teacher data were 0% for all participants. The PND indicated that the intervention was mildly effective for improving the intensity of aggressive behaviors at home for Adam but ineffective for Bob and Carter. Additionally, the PND indicated that the intervention was not effective for improving the variable at school. The IRD for the parent data were 57% for Adam, -50% for Bob, and 37% for Carter. The IRD for the teacher data were 0% for Adam, -67% for Bob, and 67% for Carter. For Adam, the IRD indicated that the intervention was moderately effective for decreasing the intensity of aggressive behaviors in the home but ineffective at school. The IRD indicated that the intervention had a moderately negative effect on the intensity of aggressive behaviors at home and school



for Bob. For Carter, the IRD indicated that the intervention was moderately effective for decreasing the intensity of aggressive behaviors at school, but not at home.

Overall, the data showed that the intervention had a mild effect on the intensity of aggressive behaviors at home for Adam but not at school. For Bob, the data suggested that the intervention may have had a negative effect on the intensity of aggressive behaviors at home and school. The intervention was not effective for decreasing the intensity of Carter's aggressive behaviors at home, but the IRD and visual analysis indicated that the intervention was mildly effective for the variable at school. Overall, the data suggested that Animal Assisted Therapy may have a positive effect on the intensity of aggressive behaviors.

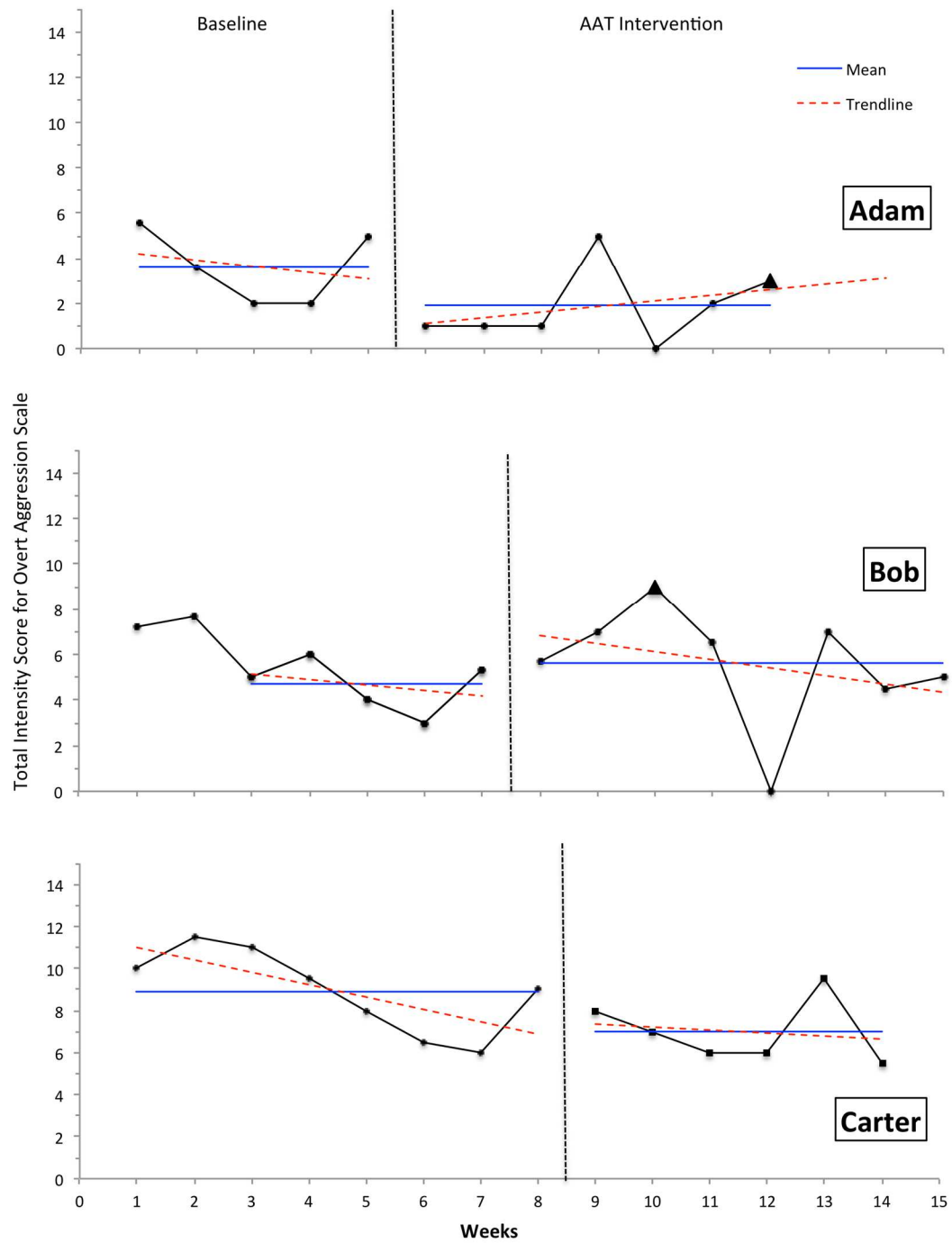


Figure 9. Intensity of Aggressive Behavior at Home

Table 9

*Results of Intensity of Aggressive Behaviors at Home*

Participant	Mean		Trend		PND	IRD
	Baseline	Intervention	Baseline	Intervention		
Adam	4.2	1.9	None	Increasing Slightly	57%	57%
Bob	4.7	5.6	None	Decreasing Slightly	13%	-50%
Carter	8.9	7.0	Decreasing	None	17%	37%

*Note:* PND = Percentage of Non-overlapping Data; IRD = Improvement Rate Difference

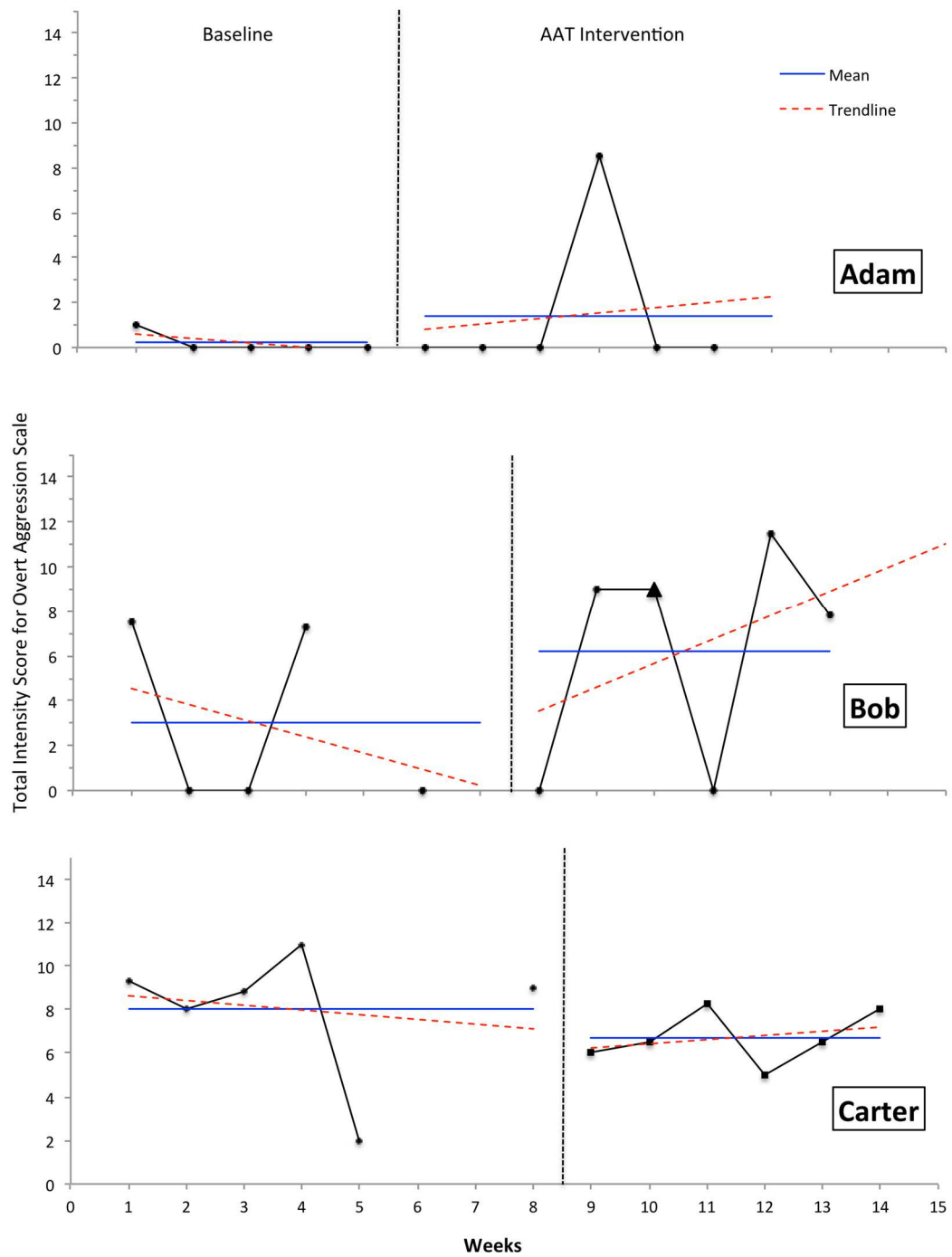


Figure 10. Intensity of Aggressive Behaviors at School

Table 10

*Results of Intensity of Aggressive Behaviors at School*

Participant	Mean		Trend		PND	IRD
	Baseline	Intervention	Baseline	Intervention		
Adam	0.2	1.4	None	Increasing	0%	0%
Bob	3.0	6.2	Decreasing	Increasing	0%	-67%
Carter	9.0	6.7	None	None	0%	67%

*Note:* PND = Percentage of Non-overlapping Data; IRD = Improvement Rate Difference

## **CHAPTER V**

### **DISCUSSION**

This chapter provides a brief overview of the study followed by a discussion of the effectiveness of the intervention, Animal Assisted Therapy, on three students with Autism Spectrum Disorder who often have tantrum and aggressive behaviors. Additionally, limitations of this study are discussed. Finally, implications of the research and recommendations for future research are discussed.

#### **Overview of the Study**

Children with Autism Spectrum Disorder often have difficulties in other areas in addition to the deficits in social interaction and communication skills and restricted and repetitive behaviors. Emotional regulation has been a particular area that children with ASD often have had difficulties in. Research has shown that children with ASD have had more problems with emotional regulation than other children who were not on the spectrum (Garon et al. 2009; Gomez & Baird 2005; Rieffe et al 2011). Furthermore, the symptoms of emotional dysregulation were often exacerbated in children with ASD and could lead to externalizing behaviors such as tantrums and aggression (Mazefsky et al., 2012). Tantrums and aggressive behaviors were common, co-occurring behaviors in children with ASD. Mayes and Calhoun (2011) found that more than 90% of a sample of 777 children with ASD had tantrums and aggressive behaviors.

The behavioral symptoms of emotional regulation (e.g., tantrums and aggression) need to be addressed because of the negative impact these behaviors could have, especially with children who had ASD. These behaviors could exacerbate the core symptoms of ASD. Dominick et al. (2007) found that children who exhibited atypical behaviors, such as tantrums and aggression, tended to have lower levels of expressive language, more severe social deficits, and more repetitive behaviors. Other negative outcomes of these behaviors included higher rates of bullying and victimization of bullying (Rieffe et al., 2012), the use of anti-psychotic medication (Tsakanikos et al., 2007), admission to residential facilities (Lakin, 1983), and out of home placement (McIntyre et al., 2002). Additionally, these behaviors often increased the stress of parents and teachers (Lecavalier et al., 2006). Due to the potential negative impact of tantrum and aggressive behaviors, it is important to find an intervention that is effective in decreasing these behaviors.

Animal Assisted Therapy is an intervention that incorporates an animal into the therapeutic process. Animal Assisted Therapy is used with a wide variety of populations and has become an increasingly popular intervention for children with ASD. Although the research did not always support the effectiveness of AAT, some studies have shown a positive effect on the core symptoms of ASD. Several studies have shown that AAT has had a positive effect on social behavior of children with ASD (Alison, 2010; Krskova et al., 2010; Martin & Farnum, 2012; Nakanishi, 1999; Petrongelli-Halloran, 2010; Redeker & Goodman, 1989; Sams et al., 2006). Additionally, research on AAT has shown a positive impact on communication of children with ASD (Alison, 2010; Martin & Farnum, 2012; Nakanishi, 1999; Sams et al., 2006; Stoner, 2002; Terrasi, 2007). Some

studies have also shown that AAT could improve restricted and repetitive behaviors of children with ASD (Alison, 2010; Brekke, 2008; Redefers & Goodman, 1989).

In other populations, AAT has been used as an intervention to improve emotional regulation and externalizing behaviors. Studies have shown that AAT has improved emotional regulation in children (Turner et al., 2009), adolescents (Burger et al., 2009), at-risk and delinquent female adolescents (Foley, 2008), and male drug-addicted criminal offenders (Burger et al., 2011). Additionally, studies have shown that AAT has decreased aggression (Long, 2009), decreased anger (Kaiser et al., 2004), decreased disciplinary referrals (Schneider, 2011), and improved behavior problems (Boe, 2007; Chronister, 1993; Emory, 1992; Malakoff, 2009; Stebbins, 2012; Whitely, 2009) in children and adolescents. Because AAT has been shown to be effective for improving the core symptoms of ASD and improving emotional regulation and externalizing behaviors in other populations, the purpose of this study was to determine if AAT was effective for improving emotional dysregulation in children with ASD. Tantrums and aggression are observable, externalizing behaviors that are often associated with emotional dysregulation. Therefore, this study used tantrums and aggressive behaviors as indicators of emotional dysregulation.

### **Interpretation of Findings**

Unexpectedly, the data showed very little improvement in tantrum and aggressive behaviors of children with ASD after the AAT intervention. The results indicated that the AAT intervention did not decrease the frequency and intensity of tantrum behaviors. There was some evidence that indicated that the AAT intervention might decrease the duration of tantrum behaviors. However, the data to support this was minimal.



Additionally, the results indicated that the AAT intervention did not decrease the frequency of aggressive behaviors. There was minimal data that indicated that the AAT intervention might decrease the intensity of aggressive behaviors. These findings were interesting, because it could be assumed that decreasing the duration of tantrums and intensity of aggressive behaviors may eventually lead to a reduction of the frequency of tantrum and aggressive behaviors.

Overall, the data do not suggest that the Animal Assisted Therapy intervention using the Mutt-i-grees curriculum had a positive effect on the participants' tantrums and aggressive behaviors. This finding did not support the research that showed that AAT was an effective intervention for improving emotional regulation and externalizing behaviors. The lack of support may have been due to some of the factors that were personal to Bob. Adam and Carter showed more improvement than Bob. This may indicate that the intervention was effective, but there was something particular about Bob that related to his failure to benefit from the intervention. For instance, Bob was the only participant that did not have a pet dog at home. It is possible that the intervention was more effective for Adam and Carter because they had dogs at home. Perhaps they were able to practice some of the skills they learned at home with their dogs.

Additionally, there were a few weeks during which Bob was sick. This could have impacted his behaviors. There were also a few weeks during the baseline phase when his father completed the rating scales instead of his mother. It is possible that his father may have rated him differently than his mother, which would impact the baseline data. Perhaps it made the baseline data lower, which would allow for less improvement to be seen during the intervention phase.

Another interesting factor that may have impacted Bob was the fact that he had a different therapy dog during the 10th week. During the 10th week, he saw the first therapy dog. He saw the second therapy dog all other weeks. The data showed that after he had the different therapy dog, his behaviors increased at home but decreased at school. Adam also had a change in therapy dogs, but this occurred during the last week of the intervention phase. Therefore, there were no data afterward to indicate whether this impacted his behaviors, too. Researchers believe that AAT may work for children with ASD because the animal works as a transition object. It was theorized that the child first bonds with the animal and then expands the bond to others in the environment (George, 1988). Bob may have bonded with his therapy dog and when the other therapy dog was introduced he may have been unable to form a bond with the new therapy dog in the brief amount of time they worked together. Because Bob may not have bonded with the new therapy dog, he may not have learned the skills that were introduced during that session. This may have caused his behaviors to change.

Another hypothesis for why improvement was minimal was that the intervention period was not long enough. The intervention period for this study ran for 6 to 8 weeks with a total of 12 sessions. O'Haire (2013) conducted a literature review on Animal Assisted Intervention for ASD and found that the average intervention phase lasted 12.2 weeks with 13.4 sessions. The range of weeks was 4 to 24 and the range of sessions was 6 to 24. Additionally, the majority of the research that showed AAT had a positive effect on emotional regulation and externalizing behaviors had longer intervention periods. The intervention phases tended to be 10 weeks or longer. Although this study was close to the average number of sessions, the number of weeks was significantly shorter than the

average. It may have been beneficial to have one session per week for 12 weeks instead of 2 sessions per week for 6 weeks.

Another possible explanation for the lack of effect of the intervention was that the Mutt-i-grees curriculum may not have been as effective as some of the other AAT programs. There is a wide variety of Animal Assisted Interventions and no standardized protocols. The activities used during the Animal Assisted Intervention varied from study to study. Even the type of animal that was used varied. O'Haire (2013) found that most of the interventions focused on animal, care, knowledge, and games. Some of the studies also focused on a specific skill. This study used the Mutt-i-grees Curriculum with a therapy dog. The curriculum focused on social-emotional learning while incorporating a therapy dog. It may be that the activities in the sessions of this study were not similar to the activities in other studies that showed positive effects of the Animal Assisted Intervention. The intervention did not focus on animal care or knowledge. Nor did it focus on a specific skill. It focused on learning about different emotions and proper ways to manage emotions while incorporating the therapy dog. Perhaps the therapy dog was not incorporated enough. Or it may be that the lessons provided in the curriculum were not effective. Additionally, the lessons occurred outside of the participant's natural environment, but the rating scales were based on the participant's in their natural environment. This required the participants to generalize the skills learned during the lesson to their natural environment. Other studies that showed that AAT had a positive effect on children with ASD did not require skill generalization (Alison, 2010; Redeker & Goodman, 1989). Perhaps improvement may have been seen if it were possible to

implement the lessons in the natural setting or if the data was collected during the lessons.

Additionally, the intervention may not have been effective because the lessons from the Mutt-i-grees curriculum may not have related to the function of the participants' aggression and tantrum behavior. During the baseline phase, a functional behavior assessment was not completed to determine the function of the participants' tantrum and aggressive behaviors. The intervention may have been for effective if the lessons related to the function of the participants' tantrums and aggressive behaviors. It is possible that the lessons did not relate to or were perhaps contraindicated given the function of the participants' behaviors.

During the intervention phase, Adam's and Carter's parent and teacher verbally reported to the researcher more improvement in the child's tantrum and aggressive behaviors than were seen on the rating scales. This suggested that the Temper Tantrum Grid and Overt Aggression scale may have not measured the exact areas of change that were observed by the raters. To the researcher's knowledge, this was the only study that used those measures to examine the effects of an Animal Assisted Therapy intervention. The Temper Tantrum Grid and Overt Aggression scale was chosen because it could be used to measure progress. Whereas, other commonly used instruments, such as the Child Behavior Checklist, were not suitable for a single-case design where measures needed to be sensitive to change over a short amount of time. Additionally, the measures were chosen because, not only do they measure tantrums and aggressive behaviors, but they also measured different components of those behaviors (i.e., frequency, duration, and intensity). Perhaps the factors included in the rating scales were not enough. Adam's

mother reported that Adam was beginning to recognize situations where he became irritated and may lead to a meltdown. For example, he was able to verbalize to his mother that he wanted to bring his sensory bag with him to music class because the noise was too much for him and he wanted to be able to use his headphones to block out the noise. This indicated that he was beginning to recognize his emotions and learn how to prevent potential outbursts. However, the rating scales did not show this. Additionally, the data may not have provided the most accurate reflection of the participants' tantrum behaviors because the data were recorded on a weekly basis and required the raters to estimate the average of frequency, intensity, and duration of each behavior component. The raters may have rated the participant on the experience they had with them that day or the day before instead of for the whole week. Having the data recorded on a daily basis may have resulted in more accurate information.

Perhaps the intervention did not have the effect that was hypothesized because some of the variables were lower than was expected and had more variability than was expected during the baseline. When rated by the teachers, the variables especially had lower rates than was expected. This did not leave much room, if any, for improvement of these variables at school. Additionally, the large range of the variables decreased the amount of improvement that could be seen. The intervention may have been more effective if the frequency, intensity, and duration of tantrums and the frequency and intensity of aggressive behaviors occurred at higher rates with less variability during the baseline phase. The low rates and high amount of variability was unexpected because the parents indicated that the behaviors occurred frequently and consistently at home and school.

### **Implications**

Results of this study indicated that Animal Assisted Therapy did not decrease tantrum and aggressive behaviors of the participants with Autism Spectrum Disorder. Because children with ASD often have temper tantrums and aggressive behaviors that could further impact their social interactions with others, research needs to focus on how to reduce and eliminate these problem behaviors. Animal Assisted Therapy is an intervention that needs to be investigated further for reducing problems behaviors of children with ASD.

Future research should focus on the components of AAT that make it an effective intervention. Studies need to report more in depth how the animal was used during the sessions and what the activities are specifically for each session. Standardized protocols for AAT would be beneficial to future researchers. Even though AAT may include different types of animals, a protocol could be developed for each type of animal. Without knowing which components of AAT have the most impact or having a standardized protocol, it is difficult to build evidence of the effectiveness of AAT. One study may not find an effect just because the type of activities used differed from other studies.

To expand this study, a recommendation would be to lengthen the number of weeks the sessions were conducted. The 12 sessions could be implemented over 12 weeks instead of 6 to 8. Another recommendation would be to use different measures of emotional regulation. Even different measures of tantrums and aggressive behaviors may be beneficial. During the intervention phase, Adam and Carter's parents and teachers verbally reported more improvements than were seen on the rating scales. This suggested

that the measures may not have been sensitive enough to the change or did not measure the change that the raters saw. Using different measures in future research may allow the effect of the intervention to be seen. A recommendation would be to use rating scales that could be completed on a daily basis instead of weekly.

Another recommendation would be to complete a functional behavior assessment during the baseline and determine the function of participants' tantrums and aggressive behaviors. Then, choose lessons from the Mutt-i-grees curriculum and/or other resources that relate to behavior function. This may result in more improvements seen with the participants' behaviors.

### **Limitations**

This study had a number of limitations. Using a non-concurrent design limited the ability to control for history effects, maturation, and regression to the mean. There may have been other factors that occurred during the intervention phase that caused the dependent variable to increase or decrease. Additionally, there may have been changes that naturally occurred over time that could have been confused with an intervention effect. Because the participants were selected for their extreme scores, it was possible that some of the changes seen may have been naturally less extreme due to regression toward the mean. Another limitation of this study was the weeks of missing data. It was not possible for the teachers to collect data when the student was not there due to illness or school closures. Additionally, the teachers' and parents' willingness to turn in the data varied from each participant. Therefore, there were missing weeks of data because of this. The Percentage of Non-overlapping Data (PND) and Improvement Rate Differences (IRD) were calculated without including the missing data. There was no research on how

to handle missing data when calculating the PND and IRD. This may have increased the PND and IRD values, which may have caused more of an effect to be seen than what would have been seen if there were no missing data.

### **Summary**

The present study examined the effects of Animal Assisted Therapy on children with Autism Spectrum Disorder's tantrum and aggressive behaviors. Three male children with high functioning autism in grades kindergarten through second participated in the study. All participants had frequent temper tantrums and aggressive behaviors. After baseline data was collected, the children participated in 12 individual AAT sessions over 6 to 8 weeks. The results indicated that there were very minimal change to the participants' tantrum and aggressive behaviors during the intervention phase. This study did not support the hypothesis that AAT reduced tantrum and aggressive behaviors of children with ASD.



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**APPENDIX A**  
**TEMPER TANTRUM GRID**

### TEMPER TANTRUM GRID

In the table below, please circle the number that shows how often and how intense each physical behavior was **during tantrums** in the past week using the following scale to rate the frequency of these behaviors:

1 = Never; 2 = Seldom; 3 = Some of the Time; 4 = Often; 5 = All of the Time

Please use the following scale to rate the intensity of these behaviors:

1 = Little or none; 2 = Mild; 3 = Moderate; 4 = Severe

Please use the following scale to rate the duration of these behaviors (scale is in minutes):

1 = >5; 2 = 5-10; 3 = 10-15; 4 = 15-20; 5 = 20-25;

6 = 25-30; 7 = 30-35; 8 = 35-40; 9 = 45-50; 10 = 50<

<b><u>Behavior</u></b>	<b><u>Frequency</u></b>	<b><u>Intensity</u></b>	<b><u>Duration</u></b>
Cry	1 2 3 4 5	1 2 3 4	1 2 3 4 5 6 7 8 9 10
Whine	1 2 3 4 5	1 2 3 4	1 2 3 4 5 6 7 8 9 10
Yell Words	1 2 3 4 5	1 2 3 4	1 2 3 4 5 6 7 8 9 10
Scream at high pitch	1 2 3 4 5	1 2 3 4	1 2 3 4 5 6 7 8 9 10
Flap Hands	1 2 3 4 5	1 2 3 4	1 2 3 4 5 6 7 8 9 10
Throw things	1 2 3 4 5	1 2 3 4	1 2 3 4 5 6 7 8 9 10
Run/walk away	1 2 3 4 5	1 2 3 4	1 2 3 4 5 6 7 8 9 10
Hit	1 2 3 4 5	1 2 3 4	1 2 3 4 5 6 7 8 9 10
Stamp	1 2 3 4 5	1 2 3 4	1 2 3 4 5 6 7 8 9 10
Kick	1 2 3 4 5	1 2 3 4	1 2 3 4 5 6 7 8 9 10
Lie, sit, kneel, or throw self on floor	1 2 3 4 5	1 2 3 4	1 2 3 4 5 6 7 8 9 10
Grab/push things or slam doors	1 2 3 4 5	1 2 3 4	1 2 3 4 5 6 7 8 9 10



**APPENDIX B**  
**PERMISSION FOR TEMPER TANTRUM GRID**

## PERMISSION FOR TEMPER TANTRUM GRID

**From:** Gerry Giesbrecht [ggiesbre@ucalgary.ca]

**Sent:** Thursday, February 21, 2013 11:18 AM

**To:** Rebecca Johnson

**Subject:** RE: Temper Tantrum Grid

Hi Rebecca,

Thanks for your email. Sounds like a great project. Yes you may use the instrument. I'm not aware of any studies that have used it with autistic children. I would be very interested in the results of your study, so please update me when you have some results. There's a good chance that down the road some time I will be organizing a symposium at a meeting (perhaps SRDC) that will focus on temper tantrums so please keep me informed about your research.

Best Regards,

Gerry Giesbrecht, PhD, R.Psych

Assistant Professor, Dept. of Paediatrics, University of Calgary

(403) 955-2793

[www.fetalpro.ca](http://www.fetalpro.ca)

**APPENDIX C**  
**THE OVERT AGGRESSION SCALE**

### THE OVERT AGGRESSION SCALE

Date/ Approx. Time	Verbal Aggression	Physical Aggression Against Self	Physical Aggression Against People	Physical Aggression Against Objects
	<input type="checkbox"/> Loud noises shouts angrily	<input type="checkbox"/> Minor injury	<input type="checkbox"/> Threatens swings	<input type="checkbox"/> Slams doors makes mess
	<input type="checkbox"/> Yells mild insults	<input type="checkbox"/> Moderate injury bangs head	<input type="checkbox"/> Strikes, kicks, pushes	<input type="checkbox"/> Throws objects
	<input type="checkbox"/> Curses viciously Moderate threats to self/others	<input type="checkbox"/> Minor cuts, bruises, burns	<input type="checkbox"/> Causes mild to moderate injury	<input type="checkbox"/> Breaks objects, windows
	<input type="checkbox"/> Clear Threats to self/others	<input type="checkbox"/> Bleeding, loss of teeth, loss of consciousness	<input type="checkbox"/> Causes severe injury	<input type="checkbox"/> Sets fires, dangerous behaviors
	<input type="checkbox"/> Loud noises shouts angrily	<input type="checkbox"/> Minor injury	<input type="checkbox"/> Threatens, swings	<input type="checkbox"/> Slams doors, makes mess
	<input type="checkbox"/> Yells mild insults	<input type="checkbox"/> Moderate injury/ bangs head	<input type="checkbox"/> Strikes, kicks, pushes	<input type="checkbox"/> Throws objects
	<input type="checkbox"/> Curses viciously Moderate threats to self/others	<input type="checkbox"/> Minor cuts, bruises, burns	<input type="checkbox"/> Causes mild to moderate injury	<input type="checkbox"/> Breaks objects, windows
	<input type="checkbox"/> Clear threats to self/others	<input type="checkbox"/> Bleeding, loss of teeth, loss of consciousness	<input type="checkbox"/> Causes severe injury	<input type="checkbox"/> Sets first, dangerous behaviors

**APPENDIX D**  
**PERMISSION FOR OVERT AGGRESSION SCALE**

## PERMISSION FOR OVERT AGGRESSION SCALE

**From:** Yudofsky, Stuart C [stuary@bcm.edu]  
**Sent:** Friday, February 22, 2013 3:35 PM  
**To:** Rebecca Johnson  
**Cc:** Kathrine Hak  
**Subject:** RE: Overt Aggression Scale

Dear Ms. Jesionowicz:

Thank you for this communication. You have my permission to utilize the OAS for the purpose that you indicate. The scale was validated in children. Good luck with your research. Information on the scale and its scoring is readily available in the scientific literature.

Stuart Yudofsky

Stuart C. Yudofsky, M.D.

D.C. and Irene Ellwood Professor and Chairman,  
Drs. Beth K. and Stuart C. Yudofsky Presidential Chair in Neuropsychiatry,  
Distinguished Service Professor,  
The Menninger Department of Psychiatry and Behavioral Sciences  
Baylor College of Medicine  
One Baylor Plaza, MS; BCM 350  
Houston, Texas 77030;  
Chairman, Department of Psychiatry  
The Methodist Hospital  
713-798-4945

**APPENDIX E**  
**LIST OF MUTT-I-GREES CURRICULUM LESSONS**  
**THAT WERE USED**

LIST OF MUTT-I-GREES CURRICULUM LESSONS  
THAT WERE USED

- \* 1.1 Me & my Mutt-i-gree
- \* 1.6 So I said to myself
- \* 2.1 Can you guess how I feel
- \* 2.2 I am mad
- \* 2.3 I am sad
- \* 2.4 So many feelings, so little time
- \* 2.5 Feelings are strong
- \* 2.6 That's okay- that's not okay
- \* 2.7 Now I feel better
- \* 2.8 Let me tell you how I feel
- \* 3.1 How does Mutt-i-gree Puppet feel
- \* 3.2 How would you feel
- \* 3.3 How would Mutt-i-gree Puppet feel
- \* 3.4 Whoops
- \* 3.5 I'm really sorry
- \* 3.6 What I meant was
- \* 4.1 Can I get a little help
- \* 5.1 It's your choice
- \* 5.2 Connecting choices & consequences
- \* 5.3 The four paws of problem solving
- \* 5.4 What is a good decision



- \* 5.5 I can't wait
- \* 5.6 But I don't want to
- \* 5.7 You win some, you lose some, and some you tie

**APPENDIX F**  
**INSTITUTIONAL REVIEW BOARD APPROVAL**

## IRB APPROVAL DOCUMENT

*Institutional Review Board*

DATE: August 26, 2014

TO: Rebecca Jesionowicz  
FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [436882-4] Dissertation  
SUBMISSION TYPE: Continuing Review/Progress Report

ACTION: APPROVED  
APPROVAL DATE: August 20, 2014  
EXPIRATION DATE: August 20, 2015  
REVIEW TYPE: Expedited Review

Thank you for your submission of Continuing Review/Progress Report materials for this project. The University of Northern Colorado (UNCO) IRB has APPROVED your submission. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on applicable federal regulations.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require that each participant receives a copy of the consent document.

Please note that any revision to previously approved materials must be approved by this committee prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of August 20, 2015.

Please note that all research records must be retained for a minimum of three years after the completion of the project.

If you have any questions, please contact Sherry May at 970-351-1910 or [Sherry.May@unco.edu](mailto:Sherry.May@unco.edu). Please include your project title and reference number in all correspondence with this committee.

Hi Rebecca,