An Evaluation of the Attitudes Teachers Have Towards Adopting Evidence-Based Practices for Students with Autism in Preschool Classrooms

By

Brooke Young Carson © 2014

Submitted to the graduate degree program in Special Education and the Graduate Faculty of the University of Kansas in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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Abstract

No longer considered a rare or low incidence disability, autism spectrum disorder (ASD) has made an impact in all academic environments across the country and around the world for educators in both general and special education settings. Given the complexity of ASD, the need goes beyond identifying effective practices but examining how teachers' attitude about evidence-based practices influences their willingness to actually implement them.

This study examined the responses from 73 certified preschool educators working in preschool programs for students with ASD relative to their attitude towards adopting evidence-based practices. Participants completed the *Evidence-Based Practice Attitude Scale* (EBPAS) in an online forum. In addition to the EBPAS, fidelity measures associated with three different models were used to measure the manner in which participants used the three approaches in the preschool classrooms. The participants were part of a larger, national multi-state study, *Comparison of Two Comprehension Treatment Models for Preschool-aged Children with Autism and Their Families* (P.I. S. Odom: IES: R324B070219) which was examining comprehensive treatment model preschool programs for children with ASD.

Results from an ANOVA analysis between the three preschool models indicated that attitudes teachers have toward using evidence-based practices did not significantly vary across models. Additionally, a series of Pearson correlation coefficients were used to determine the strength of the relationship between teaching fidelity and the attitudes teachers have toward adopting evidenced-based practices.

Acknowledgements

I begin with the one person, Dr. Rich Simpson, who has been my mentor, advisor, colleague, and friend for many years. Rich, your belief in me throughout my professional journey has been unfailing and an absolute foundation for not only my dissertation, but my career. The learning and leadership opportunities you provided and entrusted me with during my doctoral program have literally changed my life…thank you.

A special thank you to my additional committee members: Drs. Deshler, Cheatham, Frey and Colson. I am so appreciative of your time and willingness to support me in my dissertation. I am in awe of the contribution this particular group of people has made to the field and grateful you've been part of my personal project…thank you.

To Dr. Matt McBee who is now at East Tennessee State University- your support, guidance and direction for my research design was immeasurable, particularly with your knowledge of the larger national study. Your willingness to talk on the phone, answer my many emails, prompt me to think differently and encourage me that I was on the right track brought me to this place…thank you.

I'm extremely grateful to two organizations: The University of North Carolina (Frank Porter Graham Child Development Institute) for their support in my role as a researcher on this project and their willingness to guide from a distance; Colorado Department of Education for their encouragement to me during this process…thank you.

And personally, to Dr. Laurie Sperry for your expertise and willingness to read drafts, answer questions and locate information when I couldn't remember a particular detail. You were my reality check. Your friendship is a true gift…thank you.

To my parents, my sister Cindy, other family members and dear friends: I appreciate you standing by me for years to see this doctoral program and project to completion. There have been countless conversations with encouragement from all of you...thank you.

And I end with my husband Bill. Bill, you have been my greatest cheerleader, motivator, supporter and constant fan, never doubting for a minute that any of this was out of my reach. I hear you talking about me at times to our friends and others about my doctoral program and dissertation journey and I'm humbled. This accomplishment means so much more because of you …thank you.

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CHAPTER 1

Introduction, Background and Rationale for the Study

Current legislation and demands for educational reform in the field of special education call for educators to use scientifically based practices when teaching students who qualify for services under the Individuals with Disabilities Education Act 2004 (National Research Council, 2001; Odom, Brantlinger, Gersten, & Horner 2005). Daunting as this task may appear, it is coupled with the additional requirements of ensuring that each learner has a 'highly qualified' teacher, as prescribed in the Elementary and Secondary Education Act (Darling-Hammond & Berry, 2006) formerly the No Child Left Behind Act of 2001. Relative to meeting requirements of this legislation, it is more important than ever to know what methods and practices educators are using with students in school settings and specifically if educators are consistently using evidence-based practices with their students.

The United States Department of Education's Office of Special Education Programs requested the National Research Council (2001) to review, analyze and make autism-focused recommendations based on the extant literature. The particular focus of this process related to policy, science and theories was designed to develop a structure for assessing the effectiveness of interventions for young children with autism. To accomplish this task the National Research Council formed the Committee on Educational Interventions for Children with Autism (National Research Council, 2001).

The Committee on Educational Interventions for Children with Autism was charged with looking into several issues pertaining to the delivery of educational programs for young children with autism: (1) goals for children with autism and their families, including diagnosis, assessment and prevalence; (2) characteristics of effective interventions; (3) policy, legal and research issues; and (4) methodological issues in research on educational interventions.

A major and pivotal issue being debated among professionals and stakeholders in the field of ASD relates to identifying the most salient elements of effective programs for students with Autism Spectrum Disorders (ASD), including interventions that hold the most promise for learners with autism. Practitioners across the field of autism have been engaged in the debate of defining evidence-based interventions, including how to categorize such practices. Although not consistent, there is agreement that teachers also need to include professional judgment when making decisions about the efficacy of said interventions, and not just a rubric of categories (Cook, Tankersley, & Landrum, 2009). Using the Council for Exceptional Children (CEC) Division for Research effective interventions criteria, Odom, Brown, Frey, Karasu, Smith-Canter, and Strain et al., (2003) identified the following evidence-based practices: augmentative and alternative communication methods, differential reinforcement, discrete trial training, naturalistic interventions, peer-mediated intervention, positive behavior supports, and videotape modeling. However there has been little attention given the issue of the extent to which these methods are being used and whether these practices are being implemented with fidelity (Coman, 2010; Odom et al., 2003). Both the National Professional Development Center (NPDC) for Autism Spectrum Disorders (2010) and the National Standards Project (National Autism Center, 2009) determined evidence-based practices through a literature review of current published research articles. The NDPC study found 24 evidence-based practices with sufficient evidence (e.g. video modeling, visual supports, task analysis, peer-mediated instruction) to qualify as recommended methods (Odom, Collet-Klingenberg, Rogers, & Hatton, 2010). The NSP found similar practices, albeit some of the practices were given a slightly different coding system (i.e. established treatment, emerging treatments, unestablished treatments) (National Autism Center, 2009).

Assessing the extent to which interventions are used by educators with fidelity is a daunting task, given that there has been limited research into the model or theoretical foundation teachers use and its impact on teacher attitude (Coman, 2010). This undertaking is even more challenging relative to educators who work with students with ASD. Students with ASD are unique in their educational demands and they require specialty tools and methods in order to make educational progress (Iovannone, Dunlap, Huber, & Kincaid, 2003; Simpson, deBoer-Ott, & Smith-Myles, 2003; Simpson, Mundschenk, & Heflin, 2011). According to Learman, Vorndram, Addison, and Contrucci Kuhn (2004) teachers lack access to sufficient strategies required to effectively educate children with autism, who by definition have unique cognitive learning patterns, challenging behaviors, and deficits in communication. Although there has been a consistent reporting of what students with ASD need to be taught, implementing those practices with fidelity still remains a challenge given the inconsistencies with approach (Odom, , Colltt-Klingenberg, Rogers, & Hatten, 2010). The difficulty of educating learners diagnosed with ASD is exacerbated by the increased prevalence of autism-related disabilities. With prevalence rates increasing to 1:88 (and 1/54 for males) (from 1:110 and 1:150 only a few years ago) (Centers for Disease Control, 2012), approximately1% of children in the United States currently carry a diagnosis of ASD (CDC, 2012). As a result of these and other factors educators of children and youth with ASD are increasingly being challenged and admonished to demonstrate desired educational outcomes with their students. One of the mechanisms for producing such gains rests with use of scientifically supported methods (Yell, Drasgrow, & Lowrey, 2005). Thus, increasingly special educators across the nation are being asked to educate learners with ASD using evidence-based practices (Simpson et al., 2011; Yell & Katsiyannis, 2003).

With the prevalence of autism continuing to increase, early intensive intervention is of significant importance. Stahmer, Collings, and Palinkas (2005) found that few providers had a strong foundation in selecting and utilizing evidence-based practices for students with autism in early intervention settings, both school and community. Early skill development for children with ASD is essential for successful participation within school and home settings, including initiating their needs, responding to joint attention, acceptance of a variety of people and making requests of adults (McConachie & Diggle, 2007). Finding trained staff who know to recognize the first indicators of autism and then to effectively establish systems for students with ASD to learn and then to facilitate that instruction is challenging (Simpson, 2005).

The No Child Left Behind Act (NCLB) of 2001 gave impetus to the culture of adopting scientifically based practices for use in special education classrooms. Scientifically based practices can be defined as those that have "significant and convincing empirical evidence and support" (Simpson, 2005, p. 145). One difficulty for educators relative to following this directive is the limited number of gold standard (experimental) research studies that have been conducted in the area of autism. Reasons for this dearth include limited availability of large samples of students with autism. Mesibov and Shea (2010) suggested including clinical expertise as a tenant to defining evidence-based practices when developing a research protocol relative to the limited number of studies based on randomized controlled trials. Research in the area of autism frequently uses single subject designs for the sample size and individualized interventions because of unique student needs (Kennedy, 2005). Given the diversity of the ASD population in special education, establishing set research protocols and guidelines is complicated. This is compounded by the complexity of specialized instruction needed across the wide continuum of services ranging from the general education classroom to the 1:1 settings in homes and schools (Odom et al., 2005). There is a gap in the research relative to directly assessing the interventions

being used by teachers in the field of ASD. The National Professional Development Center did however develop checklists which can be used to assist observers when determining to what extent evidence-based practices are evident in programs serving students with ASD (Odom, Hume, Boyd, & Stabel, 2012), and given the lack of implementation evidence in the autism literature, this contribution is significant. With the increased demand for evidence-based services and the paucity of resources in this area for educators, students with autism are at risk for poor outcomes. Without effective interventions to assist with this problem, educators and other providers face significant problems in leading their students towards maximally favorable outcomes.

Given the complexity of ASD, the need to identify effective methods and practices which are adopted by school personnel has been a challenge. Beyond the challenge of defining these practices is the matter of determining how teachers' attitude about evidence-based practices influences their willingness to actually implement them. Teachers' attitude of acceptance toward adopting strategies specific to ASD learners is a foundational issue relative to attempting to match effective teachers with successful student outcomes (Jordan, 2005). Currently there is little research available on the topic of educators' attitudes toward adopting evidence-based strategies in school systems.

Two factors influencing teacher attitudes are: (1) individual differences of providers, including training, their own beliefs and history with various practices, and (2) the organizational culture and systems already in place within work environments (Aarons, 2005). It is vitally important to determine how service providers are making decisions about which treatments to adopt as well as to determine their attitude about using those treatments. It is not enough to develop interventions for students with ASD; systems of implementation and measurement have

to occur simultaneously. Settings, procedures, and maintenance have to be developed to support autism research for students to have successful outcomes (Dingfelder & Mandell, 2011).

Relative to this issue this study investigated the attitudes of teachers who were being asked to implement evidence-based practices in comprehensive treatment preschool programs for students with ASD. A second purpose of the study was to investigate the relationship between implementation of effective practices and teachers' attitude.

Han and Weiss (2005) found that teacher efficacy, teacher burnout and teacher satisfaction and implementation were nullifying to student outcomes if there is a disconnect between a teacher's philosophy and how students learn. Also, according to Guo, Justice, Sawyer, and Tomkins (2011), an increased level of engagement by students was related to teachers having a higher level of teacher satisfaction. Given that students with ASD can have difficulty demonstrating engagement (Mesibov, Shea, & Schopler, 2005) makes this characteristic a challenge for many teachers of learners with ASD.

For this study, 73 teachers of students with ASD in four states participated. Teachers completed an online scale addressing their attitude toward evidence-based practices and their teaching philosophy for students with ASD. Fidelity measures of three different comprehensive preschool treatment programs were used to observe program implementation and teachers' ability to adhere to a program's model. In this connection, Smith et al. (2007) defines a comprehensive intervention approach as one that differs from a focused intervention method by the magnitude of service, intensity and scope within that setting. The three comprehensive preschool treatment programs that were used in the study are the Treatment and Education of Autistic and Communication-handicapped Children (TEACCH) model (Mesibov et al., 2005); and Learning Experiences Alternative Program for Preschoolers and Parents (LEAP) model (Strain & Bovey, 2006). A third approach, *Business As Usual (BAU): Typical School-Based*

Services was examined as well. This model includes services that are typically found for families in the neighborhood schools of students with ASD. This model was used to contrast the two comprehensive focused models.

The TEACCH model, based on social-cognitive theory, is founded on the principle that if the environment is maximized by emphasizing predictability and structure, students will be able to derive sound, meaningful experiences leading to successful student outcomes. There are six program components in the TEACCH model: (1) physical arrangement of the environment; (2) predictable sequence of activities; (3) visual schedule; (4) work/task activity system; (5) routines with flexibility; and (6) visually structured activities (Mesibov et al., 2005).

The second comprehensive model is LEAP, developed by Strain in1981 through the Handicapped Children's Early Education network in Pittsburgh, Pennsylvania. This model involves typically developing preschool aged- peers within classroom settings, using a general education preschool curriculum, and a combination of applied behavior analysis and developmental theory (Strain & Cordisco, 1994). The LEAP model has six program components: (1) individualized learning programs designed from initial comprehensive developmental assessments and monitored through ongoing data collection; (2) typically developing children are enrolled as fulltime class members and make up the majority of children in the class (ratio is usually 10:6); (3**)** individual instruction, sometimes occurring in individual adult led sessions or small group activities (most occur through purposefully incorporating learning opportunities in general early childhood activities and classroom routines); (4**)** parents participate in a planned parent education program: (5**)** systematic and planned transition to the next educational setting: and (6**)** training for staff leading to a high degree of implementation of the classroom model (Strain & Hoyson, 2000).

The research questions for this study are below.

Research Questions:

1. What group differences exist among teachers on an evidence-based attitude scale, *The Evidence-Based Practice Attitude Scale* (EBPAS), who work in settings that use three different preschool models (TEACCH, LEAP and BAU). Teachers using the three preschool models were compared using the overall EBPAS score and the four EBPAS subscale scores.
2. What relationship, if any, exists between teachers' scores on the EBPAS and scores on the fidelity measure of the classroom model being used.

CHAPTER 2

Review of Literature

Introduction

Interest in identifying evidence-based practices (EBP) for children and youth with autism spectrum disorders (ASD) has been augmented by the increase in the number of students being identified and placed into ASD-focused special education programs. With increased media attention there is ongoing discussion and dissention relative to more than etiology; there is a need for school practitioners to understand how to implement effective treatment. The significant increase in the demand for ASD programming and services requires school teams to demonstrate skill and knowledge in effectively teaching this challenging population. Furthermore, the field of education increasingly emphasizes the use of scientific evidence for determining which methods and practices are most effective (Mesibov, Shea, & McCaskill, 2012; Odom, Collet-Klingenberg, Rogers, & Hatton, 2010). The issue of preparing teachers and related staff to work with students with ASD has been an issue for over three decades and has continued to increase just as the prevalence has increased (Barnhill, Polloway, & Sumutka, 2011; Simpson, 1995; Simpson, deBoer-Ott, & Smith-Myles, 2003; Simpson, 2004). For teachers to have the necessary tools, personnel preparation programs have to include sound principles in their coursework, including an understanding of what is and is not effective.

With a focus on these issues, this chapter presents a review of the professional literature that discusses the support of learners though the use of effective practice educational methods. This literature review specifically examines trends and issues specific to the instruction of students with ASD. Included is a review of the following major areas: ASD effective practices, attitudes teachers have toward effective practices, the intervention method *Learning Experience in an Alternative for Preschool and Parents* (LEAP), and the educational/intervention method

Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH).

ASD Effective Practices

The National Research Council (NRC) (2001) report is routinely identified as a seminal document related to identifying and using evidence-based methods with children with autism. That report identified salient program elements that were required in order for young students with ASD to learn. Included among the recommendations was active engagement in intensive instructional programming with a minimum of at least 25 hours per week. It was also recommended that students receive repeated teaching organized around short intervals, with one-to-one and very small group interactions. A strong family component and a mechanism for evaluating programs and student's progress were also identified. This report laid the groundwork for future studies related to EBP, including current literature (Breitenbach, Armstrong, & Bryson, 2012; Simpson, Mundschenk, & Heflin, 2011).

Studies, which were based on empirical research, then followed the NRC Report (2001). These studies attempted to identify specific practices that most often led to socially valid outcomes for learners with ASD (Iovannone, Dunlap, Huber, & Kincaid, 2003; Odom et al., 2003; Yell & Katsiyannis, 2003). In addition to these studies, follow-up reports to the NRC work have also focused on classifying and categorizing ASD intervention and support methods, as well as vetting and determining the efficacy of these interventions and treatments.

Related to this determination process Odom et al. (2003) classified ASD effective practices into three groups: those with *well-established evidence* of effectiveness, *emerging and effective* practices, and *probably efficacious* practices. Odom also identified commonly used specific interventions and grouped them into the three aforementioned categories of evidence.

Differences were noted in the outcomes for the Iovannone and Odom studies. Iovannone and colleagues (2003) identified what they termed *core elements*. These core elements were recommended as comprehensive program elements for all students with ASD. Both Iovanonne's study and Odom's study referred to the NRC's 2001 recommendations and further examined and interpreted the extant literature. Odom's recommendations and analysis focused on specific interventions and practices while Iovannone's work dealt more with development of structuring elements that were perceived to be essential to developing an effective ASD program.

More recent work in the field of ASD includes a significant document, *The National Standards Report* (National Autism Center, 2009). *The National Standards Report* focuses on answering the commonly asked questions relating to how schools, agencies, and families effectively treat individuals on the autism spectrum. Field experts from around the world who were considered leaders and nationally recognized scholars supported this report. The report has a two-fold purpose; first, to provide details about the eleven treatments determined to be effective for students with ASD; and second, to create a format for educators, parents and professionals for evaluating how to select treatments and interventions (National Autism Center, 2009).

A work similar to *The National Standards Report* is a report titled *The National Professional Development Center on Autism* (2010). This report identified twenty-four practices which met criteria for being an evidence-based practice for children and youth with ASD (National Professional Development Center, 2010). Both reports overlapped in several areas related to vetting findings for various methods (i.e. peer mediated interventions, task analysis, visual supports). Table 1 displays the overlapping areas. These overlapping results have facilitated agreement among stakeholders regarding the identification of efficacious practices and evaluation criteria.

Table 1

Overlap Between Evidence-Based Practices Identified by the National Professional Development Center (NPDC) on ASD and the National Standards Project (NSP)											
Evidence-Based Practices Identified by the National Professional Development Center (NPDC) on ASD	Established Treatments Identified by the National Standards Project (NSP)										
	Antecedent Package	Behavioral Package	Story-based Intervention Package	Modeling	Naturalistic Teaching Strategies	Peer Training Package	Pivotal Response Treatment	Schedules	Self-Management	Comprehensive Behavioral Treatment for Young Children	Joint Attention Intervention
Prompting	X			x						The NPDC on ASD did not review comprehensive treatment models. Components of The Comprehensive Behavioral Treatment of Young Children overlap with many NPDC-identified practices.	The NPDC on ASD considers joint attention to be an outcome rather than an intervention. Components of joint attention interventions overlap with many NPDC-identified practices.
Antecedent-Based Intervention	X										
Time delay	X										
Reinforcement		X									
Task Analysis		X									
Discrete Trial Training		X									
Functional Behavior Analysis		X									
Functional Communication Training		X									
Response Interruption/Redirection		X									
Differential Reinforcement		X									
Social Narratives			X								
Video Modeling				X							
Naturalistic Interventions					X						
Peer Mediated Intervention						X					
Pivotal Response Training							X				
Visual Supports								X			
Structured Work Systems								X			
Self-Management									X		
Parent Implemented Intervention	The NSP did not consider parent-implemented intervention as a category of evidence-based practice. However, 24 of the studies reviewed by the NSP under other intervention categories involve parents implementing the intervention.										
Social Skills Training Groups	Social Skills Training Groups (Social Skills Package) was identified as an emerging practice by the NSP.										
Speech Generating Devices	Speech Generating Devices (Augmentative and Alternative Communication Device) was identified as an emerging practice by the NSP.										
Computer Aided Instruction	Computer Aided Instruction (Technology-based Treatment) was identified as an emerging practice by the NSP.										
Picture Exchange Communication	Picture Exchange Communication System was identified as an emerging practice by the NSP.										
Extinction	Extinction (Reductive Package) was identified as an emerging practice by the NSP.										

National Professional Development Center (NPDC) on ASD. (n.d.). Overlap Between Evidence-Based Practices Identified by the National Professional Development Center (NPDC) on ASD and the National Standards Project (NSP). Retrieved from http://autismpdc.fpg.unc.edu/content/national-standards-project

Identifying focused intervention practices with strong empirical evidence has been a clear strategy when trying to create the structure required for effective ASD programs. Researchers (Iovannone et al., 2003; Odom et al., 2003; Simpson, 2005; Yell & Katsiyannis, 2003) found practices consistent with each other across their studies. Themes of practices emerged to include systematic instruction, family involvement, specialized curriculum and behavioral strategies. The National Standards Project (NSP) in 2009 and the National Professional Development Center (NPDC) on ASD in 2010 identifies those same consistent components.

Additional articles have been written on how to categorize evidence-based practices which are determined by school teams and families. This categorization process is important because it is imperative that professionals and other stakeholders are able to identify and appropriately use procedures that have the best possibility of being effective (Simpson, 2005). By effectively being able to identify the categorized procedures students will benefit from interventions found to be the most efficacious. An expansion of this categorization process that went beyond simply identifying practices is credited to Odom, Brantlinger, Gersten, and Horner (2005). The Odom et al. team attempted to identify effective interventions, including for whom methods would be most effective and in what context. Knowing the level of support behind each of the practices is critical for teachers and school districts in order to make informed decisions and use interventions correctly.

The National Standards Project (2009) expanded their work on evidence-based practices beyond the scope of the 2001 NRC by examining practices for learners of all ages up to the age of twenty-one. This expansion occurred after the review of 775 articles. In addition, after taking into account additional research that had been conducted since the 2001 NRC Report, the NSP included details for additional transparency on the proper method for selecting interventions.

Although interventions are selected for individual students, systems must be developed for district, state and national programs in order for them to be generally effective. Thus teachers' use of particular interventions in isolation without the systematic planning structure to generalize them across settings and events results in less than optimal aggregate outcomes. One of the first articles to go beyond student-level intervention selections was written by Simpson, et al. (2011). This group focused on basic issues related to effective method use: educator's credentials (*who* should be teaching the students); settings (*where* students should be educated); and content (*what* students should be taught).

Ultimately the goal of identifying maximally effective interventions is to ensure an appropriate education for all students with ASD. In this connection the primary result of systematically examining interventions is for school-based decision makers, including parents, to have a process for identifying effective practices. This process also permits professionals and other stakeholders to categorize interventions and treatments; and then based on need, to be able to select the methods necessary for maximally effective instruction.

Teacher Attitudes Toward Effective Practices

Teachers in the field of ASD need to learn multiple strategies to support students using specialized instruction. Unfortunately learning this skill is not formally acquired but often only occurs as a result of informal and inconsistent on the job training. In special education courses offered at the university level it is common for teachers to learn about instructional practices based on a child's developmental level. Teachers who will be working with students with ASD require additional training, including specific instruction on how students with autism learn and how best to teach them. These needed skills are often not taught in typical preservice personnel preparation courses (Barnhill, Polloway, & Sumutka, 2011). Teachers may not receive specific training on how students with ASD best learn in their teacher certification programs, thus

resulting in school districts feeling the need to provide ASD training for their teachers. The need to provide specific autism training to teachers, both as preservice and inservice offerings, is especially important because of the dramatic increase in the number of children being diagnosed with autism (Center for Disease Control, 2012; Smith, Polloway, Patton, & Dowdy, 2008).

Without a doubt there has been a recent drive to utilize evidence-based practices across schools, districts, and states relative to educating children with autism. In spite of this aggressive initiative to use evidence-based practices for students with ASD, there has been very little research on issues linked to practitioners adopting effective practices (Henggeler, Chapman, Rowland, & et al., 2008) in any field. Issues linked to practitioners adopting evidence-based practices include retention of personnel, practices being implemented without fidelity, personnel resisting use of certain methods, adequate training related to correct use of certain practices, and confidence of staff in using identified practices specified by districts.

Aarons (2004a) developed the *Evidence-Based Practice Attitude Scale* to examine the attitudes mental health workers had toward adopting evidence-based practices. Subsequent to Aarons' publication in 2004, studies had been conducted to determine what attitudes professionals have when it comes to adopting new practices. The mental health field (e.g., substance abuse, counseling) and the field of community based autism support (e.g., private agencies, child care facilities) report the use of both evidence-based and non-evidence-based strategies. Staff linked to these disciplines indicate they often select approaches that combine both evidence-based and non-evidence-based elements with what they are already using or what they have access to at their work sites (Aarons 2005; Stahmer, Collings, & Palinkas, 2005). These same community mental health providers also listed limited training on evidence-based practices as a concern related to implementation of interventions and treatments.

Studies conducted by Aarons (2005) and Aarons and Sawitzky (2006) also looked at the attitudes workers had toward adoption of evidence-based practices by examining organizational culture. Organizational culture is a way to express how values and behaviors contribute to the social and psychological environment in various organizations such as a school, company, or agency. Each organization conducts business based on experiences, philosophy and expectations and thereby has an expectation as to how members approach decision making, make progress toward objectives and how that business is conveyed to the outside community.

Studies by Aarons (2005) and Aarons and Sawitzky (2006) reported that the climate of an organization impacts workers' attitude toward adopting evidence-based practices. This organizational culture climate includes the format and manner in which practices were explained, the perceived working conditions, the expectations for the workers, and the systems currently utilized.

The studies also found that attitudes toward evidence-based practices were significantly associated with the mental health provider's characteristics. For example, characteristics of mental health providers considered to be key in whether evidence-based practices are implemented include level of education attained and perceived status of positions held (for instance intern vs. paid positions). These characteristics were associated with more positive attitudes toward the actual adoption of evidence-based practices (Aarons & Sawitzky, 2006). Although providers' (e.g. teacher, school psychologist, speech language therapist) characteristics have not yet been studied within educational systems and agencies, the question remains whether the same findings exist related to adoption and use of evidence-based methods for students with ASD. School agencies need to look at what characteristics lead faculty members and staff towards adoption of evidence-based practices and thus higher rates of student success and better school outcomes. If teachers are adopting proven practices shown to be necessary for success

among students with ASD, then professionals, parents and other stakeholders (e.g. administrators, school boards) will have greater confidence in the attainment of higher achievement and other positive outcomes for all students, including students with ASD. Research has yet to focus on this important question, hence this important issue needs to be addressed.

The first study that examined the attitudes of ASD early-intervention providers toward adopting evidence-based practices was conducted by Stahmer and Aarons (2009). This study also compared attitudes of mental health workers. Findings of this study revealed that the ASD providers had a more favorable attitude toward adopting evidence-based practices than the mental health workers. However the authors also noted that there was insufficient data to precisely determine which factors were most responsible for adoption of evidence-based practices.

Aarons, Sommerfield and Walrath-Greene (2009) also looked at the role of organizational support (e.g. wages, perceived value of individuals by an organization) for staff employed by private and public agencies, relative to the use of evidence-based practices. These researchers found more favorable support for adoption of evidence-based practices within private organizations. This finding is significant because public schools serve the majority of students with ASD. Thus, in order to support the majority of our country's students with ASD, public schools need to be effective, working systems where teachers are expected and willing to adopt evidence-based practices. However, the Aarons et al. (2009) study suggests that public schools show less favorable support to adopting evidence-based practices than private agencies and that when comparing public school early intervention teachers and mental health providers, the early intervention teachers were more willing to adopt evidence-based practices. As stated previously, to date there has not been a study addressing teacher attitudes toward adoption of evidence-based

practices in school settings that serve children with ASD. However, two studies have examined common factors connected to teachers adopting proven evidence-based practices (Drahota, Aarons, & Stahmer, 2012; Guo, Justice, Sawyer, & Tompkins, 2011). Both articles examined factors affecting decision-making among teachers related to selecting maximally effective and appropriate ASD interventions.

LEAP (Learning Experience in an Alternative Program for Preschoolers and Parents)

LEAP, one of two comprehensive treatment models being examined in this study, has been in existence for more than 25 years (Strain & Cordisco, 1994; Strain & Hoyson, 2000; Strain & Schwartz, 2010). LEAP has been the subject of over 30 efficacy studies (Strain & Schwartz, 2010). These studies have examined the social, communication, academic and behavioral strategies linked to LEAP, with favorable results being reported. Studies range in design from a clustered randomized format (Strain & Bovey, 2011) to case study format studies (Strain, 2001). LEAP as a comprehensive treatment model follows a naturalistic theory, a combination of applied behavior analysis and developmental theory with the goal for the preschooler being to learn and function in a classroom environment already established in general education preschool settings. LEAP, developed by Phillip Strain, began in 1981 as a model demonstration program funded through the United States Department of Education, Handicapped Children's Early Education Program. Initially LEAP began in collaboration with public schools in Pittsburgh and by the late 1980's LEAP had expanded to other public school systems and sites were being replicated with training components included. Between 1995-1998 LEAP moved to Colorado and Douglas County became the prime demonstration site with a continuation of other demonstrations throughout the United States. As of 2010 the count of LEAP preschool replication sites was over 80. (Odom & Boyd, 2006; Strain & Schwartz, 2010).

A unique finding in these studies is that LEAP is one of only a handful of evidence-based treatment models being used in public school settings (Strain & Bovey, 2011). Public school personnel often rely on focused and individual evidence-based treatment interventions (e.g., applied behavior analysis, visual supports), however LEAP is a comprehensive treatment model that is based on more than one strategy or practice. A comprehensive treatment model is a group of treatments designed to impact a broad range of learning, and for this purpose, is focused on the core deficits of autism (Odom, Boyd, Hall, & Hume, 2010).

In this connection a longitudinal recommendation made by Strain and Hoyson (2000) was that there was a need for intensive social skill instruction to be embedded with other learning components in order to produce more favorable, generalizable outcomes for children with ASD. Strain and Hoyson (2000) came to this recommendation when looking back at an analysis of outcomes relative to social skill advancement. The assumptions for how to approach the notion of social skill teaching began with a deficit model of thinking, meaning intervention is created based on a student's skill deficits. Following that assumption, the focus shifted to analyzing the environment including a social history and context looking for cues about needed next steps. The assumptions then went to the type and quality of exchanges happening between students and their teachers and students and their peers and lastly looking at the multiple environments and settings for social skill instruction with the movement toward generalization of the skills being targeted. This trajectory of assumptions lead to where LEAP focuses today: integrating social skills as part of a comprehensive treatment model and not something that is taught in isolation and without a naturalistic context (Strain & Hoyson, 2000; Strain, Schwartz, & Barton, 2011). The intensity of the social programming component found in LEAP increases the likelihood of advancement for students in the core deficit area of social skills. In order for students to gain

access to those skills teachers need to be equipped with appropriate evidence-based teaching within the social skill domain and need to implement those interventions with fidelity to ensure a better chance for student retention.

Overview of LEAP program

In LEAP preschool classrooms the ratio is 3-4 students with ASD to 8-10 preschoolers that are typically developing (students without an Individualized Family Support Plan or an Individualized Education Plan). Young learners attend a LEAP classroom for 15 hours per week. LEAP classrooms have at least three adults present everyday with speech and language pathologists and occupational therapists being additional team members as well as classroom assistants. One adult, or the equivalent of one full time position is used to support the family focus for at home visits involving training (nine modules) specific to ASD (one full time position can serve 12 families) (Strain & Schwartz, 2010).

Essential Features of LEAP

LEAP has key features that distinguish it from other comprehensive treatment models, all of which are necessary for replication and fidelity of implementation. Features include: 1) individualized programs developed based on assessment and monitored through data driven decision making; 2) typically developing peers are full time class members; 3) individual instruction primarily occurs through embedding instruction into the activities and routines of the classroom, maximizing opportunities throughout the day; 4) family skill focus including parent education programs; and 6) transition to the next educational/grade level (Coman, 2010; Odom, Boyd, Hall & Hume, 2010; Strain & Cordisco, 1994; Strain & Hoyson, 2000; Strain & Schwartz, 2010; Strain & Bovey, 2011). An overview of the LEAP Model is presented in Table 2, below.

Table 2

LEAP Model Overview

Feature	Description
Theoretical Basis	Naturalistic, with basis in Applied Behavioral Analysis and Developmental Theory
Goal	Ability of student with ASD to learn and function within general education setting
Setting	High quality preschool program for typically-developing children Ratio of 3-4 children with ASD to 8-10 typically-developing peers
Instruction	Embedded within typical daily classroom routines Examples of Instructional techniques/strategies: Peer-mediated interventions Errorless learning Time delay Incidental teaching Pivotal response training Picture Exchange Communication System Positive Behavior Support
Particular Components	Peer-mediated Social Skills Training Systematic Parent Skills Training
Learning Objectives	Independent, generalized skill demonstration
Programming Elements for LEAP implementation	Classroom organization and planning Teaching strategies Teaching communication strategies Promoting Social interactions Providing positive behavioral guidance IEP's and Monitoring progress Interactions with child Interactions with family

TEACCH (Treatment and Education of Autistic and Communication Handicapped Children)

TEACCH is the second of the two comprehensive treatment models being examined in this study. TEACCH has a history of over 40 years as a statewide model. The history of TEACCH (Peerenboom, 2003), often called Structured Teaching (Mesibov, Shea, & Schopler, 2005; Mesibov & Shea, 2010; Mesibov, Shea, & McCaskill, 2012), is founded on evidence-based practices that address the core deficits of autism, or the 'culture of autism' (Mesibov et al., 2005). TEACCH is a comprehensive treatment model based on cognitive social learning theory, including development and behavior (Odom & Boyd, 2006; Odom, Boyd, Hall, & Hume, 2010).

The inception of TEACCH started with Dr. Eric Schopler at the Children's Research Program at the University Of North Carolina School Of Medicine in the late 1960's. Schopler was the first professional who believed there was a neurological cause for autism and that it was not a mental illness and not related to poor or cold parenting as had been espoused earlier (White, Smitth, Smith, & Stodden, 2012; Peerenboom, 2003).

Prior to its expansion into public schools, TEACCH began as a five-year grant funded by National Institute of Mental Health. In 1972, TEACCH was endorsed by the State and was mandated in North Carolina for students with ASD. Within four to five years, there were 10 demonstration classroom sites throughout the state of North Carolina as well as the supervision of classrooms in the state (Mesibov, Shea, & McCaskill, 2012). In addition to classroom sites in North Carolina, three centers developed across the state by 1978 to provide diagnostic services and parent training, a feature Schopler believed to be integral for success (Mesibov, Shea, Schopler, 2005; Mesibov, Shea, & McCaskill, 2012). TEACCH is still evident today across the United States as well as internationally; what began as a small clinic grew as a known teaching

intervention internationally. Currently TEACCH no longer operates classrooms in school districts but has nine regional clinics across North Carolina.

Mesibov and Shea (2010) report that TEACCH was developed based on evidence and observation. TEACCH was also developed in response to characteristics that were unique to students with ASD, including in accordance with theories of executive functioning that impact structure, predictability and minimizing distractions (Odom & Boyd, 2006). These characteristics include attention to detail, strength in visual processing, communication challenges, sensory issues, variability in attention shifting, challenges with concepts of time, rigidity, and adherence to routines or special areas of interest.

TEACCH is founded on the idea that classrooms and programs should be set up to accommodate the features of students with autism, a completely different premise for LEAP (naturally occurring environments). TEACCH is often considered a setting that is more self-contained while LEAP is considered a general education setting. With TEACCH, the intent is to shape the environment, arranged around the features of ASD, so that students can be more successful given the distractions and setting have been established ahead of time.

One difference to note when examining LEAP and TEACCH is LEAP is primarily a preschool model; in contrast TEACCH is also used across the life span to address ASD at all age levels. TEACCH principles have been used in studies to look at topics such as accessing the dentist as an adult (Orellana, Martinez-Sanchis, & Silvestre, 2013) and social skills training for students with less complex ASD support needs in higher grade levels (Ichikawa, et al., 2013).

Overview and Essential Features of TEACCH

Classrooms are based on the foundation of 'the culture of autism' (Mesibov, Shea & Schopler, 2005) which addresses unique characteristics and patterns evident in students with ASD which includes 1) preference for visual processing; 2) focused attention to detail; 3) ability to focus has great variability; 4) impairments in social communication; 5) time concepts as it relates to how long something lasts, sequencing; 6) adherence to routines; 7) the order for the way things should happen with inflexibility becoming pronounced; 8) heightened impulses and interests for favorite items, routines or thoughts; and 9) atypical sensory responses and preferences (Mesibov, Shea, McCaskill, 2012; Odom & Boyd, 2006).

In addition to the 'culture of autism' another essential feature to TEACCH when developing classroom programs is the concept of Structured Teaching. This is the feature most often associated with TEACCH, including a specific focus on the use of visual and other environmental supports and teaching to the strengths of student with ASD. Mesibov, Shea and McCaskill (2012) describe Structured Teaching as having four overarching concepts: 1) all goals, plans, strategies, data collection is individualized for each student; 2) physical organization of all tasks is provided, including materials, time, space and process; 3) use of visual supports (e.g. schedules, activities, choices) to aid, or at times replace, spoken language; and 4) following the interests of the student when designing activities to attain meaningful engagement.

The last essential feature for TEACCH is the idea that activities (academic, behavior, social) should all be visually self-explanatory if possible, with the goal being independence on the part of the learner. Often referred to as the five-question test: 1) <u>where</u> am I supposed to be?; 2) <u>what</u> task, work or activity will I do there?; 3) <u>how long</u> do I have to stay there or <u>how many</u>

do I have to do?; 4) how do I know when I am finished?; and 5) what do I do next? (Mesibov, Shea, McCaskill, 2012). See Table 3 for an overview of the TEACCH model.

Table 3

TEACCH Model Overview

Feature	Description
Theoretical Basis	Basis Cognitive Social-Learning theory; Structured Teaching addresses the following components of a "Culture of Autism": Visual information-processing Increased attention to details, with concurrent difficulties in sequencing and integrating these details as a whole Variability in attention Challenges with communication, especially social language Difficulty with concepts of time Routines-based Intense interests and impulses Sensory differences
Goal	Students will be able to derive sound, meaningful experiences leading to successful student outcomes if the environment is maximized by emphasizing predictability and structure
Setting	Physical Structure to indicate expectations of children and to reduce environmental distractions Due to specific modifications for students with autism, environment is often a self-contained classroom setting
Instruction	Organizing and communicating the sequence of events throughout a given period of time, using concrete (object) or symbolic (pictures, words) visual cues to aid in transitions Organizing individual tasks to indicate visually: What to do How long it will take or how many to do How much more work there is until the task is finished When is the task finished What to do next Linking individual tasks into a sequence of activities called a work/activity system Utilizing child interests and preferences into instruction

Table 3

TEACCH Model Overview	
Feature	Description
Particular Components	Physical arrangement of the environment Predictable sequence of activities Visual schedule Work/task activity system Routines with flexibility Visually structured activities Incorporating student passions into teaching and reward systems
Learning Objectives	Independent, generalized skill demonstration
Programming Elements for TEACCH implementation	Physical structure Visual schedules Work systems Assessment and Teaching Time Communication Social and Leisure Behavior Management Family Involvement

Related to these strengths and challenges, independence is a primary learning target for students with ASD. That is, individuals with ASD need to become independent and proficient in their schools and home communities (Hume, Loftin, & Lantz, 2009). Teaching independence is a pivotal goal for teachers of students with ASD. Hence, relative to TEACCH methods, teachers incorporate activities leading to independence into all planning and teaching. Thus for example, video modeling, self-monitoring and individual work systems are considered to be focused interventions that address specific behavioral targets and also are designed to build independence (Hume et al., 2009).

The use of visual supports throughout a student's day is one of those essential components associated with TEACCH, and these visual supports are created to address core

deficits in autism and take the form of schedules, calendars, planners, and work systems (Coman, 2010; Mesibov & Shea, 2010). The visual strategies used in a TEACCH model are taught as focused interventions and are used with both individuals and groups of learners (Odom, Boyd, Hall, & Hume, 2010). Results from Braiden, McDaniel, McCrudden, Janes, and Crozier (2012) supported the use of visual supports based on a study that produced statistically significant increases in students' expressive and receptive language skills when TEACCH principles were used.

Summary and Conclusions

The professional literature in the area of ASD has grown significantly in the area of characteristics, interventions and methodology in recent years, likely connected to the dramatic increase in children being identified throughout the country. Beyond identification of ASD, professionals in all areas of service for ASD have needed better information when it comes to selecting, implementing, and evaluating evidence-based practices in order for students to have successful outcomes.

With the focus on teachers being highly qualified according to the NCLB act, there is a need to know how such teachers are selecting evidence-based practices, including the likelihood that they will adopt those practices. The literature is very limited on the attitudes professionals have when it comes to adopting practices meeting the criteria of evidence-based. In fact, at the time of writing, there have been under ten studies published on the adoption of evidence-based practices with the majority of those being in the mental health field and only one of those studies was conducted in the area of ASD.

As stated previously, personnel preparation programs have to include sound principles in their coursework for teachers and providers to have the necessary tools, and that kind of specific learning can only come by understanding what is and is not effective, including an examination of which teachers are adopting evidence-based practices and what conditions may need to be addressed within the school and district organizations to address those requirements. Local and state education agencies will have to create systems for establishing practices that will encourage and enable teachers to adopt practices that are grounded in evidence.

CHAPTER 3

Methods and Procedures

Purpose

With educators facing the increased prevalence of autism spectrum disorders (ASD) (Centers for Disease Control, 2012) and demands for highly effective teachers related to the No Child Left Behind legislation (NCLB, 2002), knowing the attitudes teachers have toward adopting evidence-based practices is imperative. The test for schools becomes one of being able to identify effective method practices and teachers who are effectively implementing interventions in accordance with recommended protocol. The Institute of Education Sciences (IES) discussed the importance of establishing efficacy of treatment models (Institute of Education Sciences, 2009) for preschool programs. Important to mention again is that the research addressing the attitudes teachers have toward adopting evidence-based practices is limited; to date there has been only one published report (Stahmer & Aarons, 09) in the field of ASD. In that connection, this study examined the relationship of teacher attitudes and application of specific intervention models with fidelity. This independent dissertation study was part of a national multi-state (the University of Colorado at Denver, the University of Miami, the University of Minnesota and the University of North Carolina at Chapel Hill) preschool study, *Comparison of Two Comprehension Treatment Models for Preschool-aged Children with Autism and Their Families* (P.I. S. Odom: IES: R324B070219)

The dissertation study included teachers of students in selected preschool programs that support students with ASD. These teachers used one of three models of classroom intervention: the Treatment and Education of Autistic and Communication-handicapped Children (TEACCH) model (Mesibov, Shea, & Schopler, 2005), the Learning Experiences: Alternative Program for

Preschoolers and Parents (LEAP) model (Strain & Bovey, 2006), and the "business as usual" (BAU) model. The two primary research questions for the study are identified below.

1. What group differences exist on an evidence-based attitude scale, *The Evidence-Based Practice Attitude Scale* (EBPAS) (Aarons, 2004a), among teachers who work in settings that use three different preschool models (TEACCH, LEAP and BAU)? Teachers using the three preschool models were compared using the overall EBPAS score and the four EBPAS subscale scores.
2. What relationship exists between teacher's score on the EBPAS and scores on the fidelity measure of the classroom model being used?

Participants

One male (1%) and 72 female (99%) teachers from public school settings in four states, participated in this dissertation study. Fourteen (14) teachers were from Colorado (19%), 23 teachers from Florida (31.5%), 15 teachers from Minnesota (20.5%) and 21 teachers from North Carolina (29%). Ninety-six percent of participants were white, 3% were black and 1% was multi/bi-racial based on teachers self-reporting. Eleven percent of teachers reported being Hispanic or Latino while 62% reported not being Hispanic or Latino. Total number of years teaching and total number of years teaching in an ASD classroom were reported by the participants. Sixty-one percent of the teachers reported teaching 10 or fewer years, including years teaching in ASD classrooms, while 11% taught 21 or more years. When reporting only on years teaching in ASD classrooms, 86% of teachers taught 10 or fewer years while none of the teachers taught more than 21 years in ASD classrooms. Teachers were asked to report their highest degree earned. Five percent reported having an Associate of Arts (AA) degree, unique to the state of Colorado; 36% reported having a Bachelor of Arts (BA) or Bachelor of Science (BS) degree; 59% reported having a Master of Arts (MA) or Master of Science (MS) degree. There

were no degrees reported above a master's level. Table 4 displays the demographics of the study participants.

Table 4

Demographic Characteristics of Study Participants by Represented State

Characteristic	NC	CO	FL	MN	TOTAL
Gender					
Male	n=0 (0%)	n=0 (0%)	n=1 (4%)	n=0 (0%)	n=1 (1%)
Female	n=21 (100%)	n=14 (100%)	n= 22 (96%)	n=15 (100%)	n=72 (99%)
Ethnicity					
Hispanic or Latino	n=0 (0%)	n=0 (0%)	n=11 (48%)	n=0 (0%)	n=11 (15%)
Not Hispanic or Latino	n=21 (100%)	n=14 (100%)	n= 12 (52%)	n=15 (100%)	n=62 (85%)
Race					
Black	n= 0 (0 %)	n= 0 (0%)	n= 2 (9%)	n= 0 (0%)	n= 2 (3%)
White	n= 21 (100%)	n=14 (100%)	n= 20 (87%)	n=15 (100%)	n= 70 (96%)
Multi-Racial	n= 0 (0 %)	n= 0 (0%)	n= 1 (4%)	n= 0 (0%)	n= 1 (1%)
Classroom Type					
TEACCH	n= 12 (57%)	n= 3 (21%)	n= 7 (30.5%)	n= 2 (13%)	n= 24 (33%)
LEAP	n= 0 (0 %)	n= 6 (43%)	n= 9 (39%)	n= 7 (47%)	n= 22 (30%)
BAU	n= 9 (43%)	n= 5 (36%)	n= 7 (30.5%)	n= 6 (40%)	n= 27(37%)
Total Years Teaching					
<6	n= 8 (38%)	n= 1 (7%)	n= 8 (35%)	n= 4 (26.5%)	n= 21 (29%)
6-10	n= 5 (24%)	n= 7 (50%)	n= 5 (22%)	n= 6 (40%)	n= 23 (32%)
11-15	n= 1 (5%)	n= 4 (29%)	n= 0 (0%)	n= 4 (26.5%)	n= 9 (12%)
16-20	n= 3 (14%)	n= 1 (7%)	n= 7 (30%)	n= 1 (7%)	n= 12 (16%)
21+	n= 4 (19%)	n= 1 (7%)	n= 3 (13%)	n= 0 (0%)	n= 8 (11%)
Years Teaching ASD					
<6	n= 16 (76%)	n= 8 (57%)	n= 13 (57%)	n= 12 (80%)	n= 49 (67%)
6-10	n= 2 (9.5%)	n= 5 (36%)	n= 4 (17%)	n= 3 (20%)	n= 14 (19%)
11-15	n= 2 (9.5%)	n= 1 (7%)	n= 5 (22%)	n= 0 (0%)	n= 8 (11%)
16-20	n= 1 (5%)	n= 0 (0%)	n= 1 (4%)	n= 0 (0%)	n= 2 (3%)
21+	n= 0 (%)	n= 0 (0%)	n= 0 (0%)	n= 0 (0%)	n= 0 (0%)
Highest Degree of Teacher					
AA	n= 0 (0%)	n= 4 (29%)	n= 0 (0%)	n= 0 (0%)	n= 4 (5%)
BA/BS	n= 11 (52%)	n= 5 (35.5%)	n= 5 (22%)	n= 5 (33%)	n= 26 (36%)
MA/MS	n= 10 (48%)	n= 5 (35.5%)	n= 18 (78%)	n= 10 (67%)	n= 43 (59%)
Above Master	n= 0 (0%)	n= 0 (0%)	n= 0 (0%)	n= 0 (0%)	n= 0 (0%)

The participating teachers were enrolled in the study for one year and were assigned to the model that they were currently using in their respective programs. That is, participants were

not randomly assigned to treatment conditions. Randomly assigning teachers and classrooms to the three groups would not have been an effective procedure given the difficulty, if not impossibility, of teachers dropping their current procedures to use a procedure that had been randomly assigned. Also, in order to reach a high level of fidelity for one of the two models, the teachers and practitioners needed at least two years of training and experience with each model, thereby making random assignment of classrooms unfeasible. Thus participants were assigned to the model they were currently using to meet the two year requirement and to ensure that they were familiar with the model practices.

Multiple sites were selected for participation in the study because no one site would have had enough classrooms that would be using the three treatment conditions. Inclusion and exclusion criteria were used to establish consistency across sites in the four states. These criteria were: 1) preschool classes (serving ages 3-5) in public school setting; 2) teachers held certification/licensure in special education in their respective states; 3) LEAP model and TEACCH model teachers had formal training specific to their model by the model developers; 4) LEAP and TEACCH model teachers operated at a high level of fidelity on the respective fidelity measure for their respective program models, as recommended by the model developers (Strain & Bovey, 2006; Mesibov et al., 2005); and 5) LEAP and TEACCH teachers implemented the comprehensive model in their respective classrooms for at least two years. BAU teachers must have taught in a preschool classroom for children with autism for at least two years. Finally, (6) classrooms were excluded for having "outlier" characteristics. These outlier characteristics were determined from a classroom observation that revealed that the students in the program had characteristics that were not typical of expected features and common traits of children with ASD. For example, a classroom that served all verbal students or all female students would be considered an "outlier".

A list of school districts in the four states that had LEAP or TEACCH-style comprehensive models was available via the model developers. This information was used for purposes of recruitment. After identifying program sites for the comprehension model, BAU sites were matched within the communities of programs that employed the LEAP and TEACCH models.

The condition of state educational licensure was required for all early childhood educators working in the selected classroom. This contingency was applied in accordance with the participants' individual state requirements. Participants also attended a minimum of 12 clock hours of training specific to their model if they were teaching in a TEACCH or LEAP classroom, prior to their required two-year minimum of teaching their specific model. A minimum of one student with a diagnosis or eligibility of ASD had to be enrolled in each participant's classroom. The participants were selected from the three site types (i.e., TEACCH, LEAP, BAU) in Colorado, Florida, North Carolina and Minnesota, representing diverse metropolitan areas.

Instruments

Instruments used with the participants in the study included: (a) the Evidence-Based Practice Attitude Scale (Aarons, 2004a); (b) the LEAP Outreach Program Quality Guidelines (Strain & Bovey, 2006); (c) the Structured Teaching Checklist– Revised (Grindstaff, Wall, Turner, Boyd, & Mesibov, 2006); and (d) PDA – Program Assessment (Professional Development in Autism Center, n.d.).

The Evidence-Based Practice Attitude Scale (EBPAS) was completed by participants in an online forum on two separate occasions to examine their attitude toward adopting evidence-based practices (EBP). Participants were asked to complete the measure at the beginning and end of the school year, to determine if attitudes changed over the course of the school year. The EBPAS is copyrighted; however it was made available from the author at no charge. The 15-item

Likert measure is brief in content and took participants approximately five-ten minutes to complete. Scores (0= not at all to 4= to a very great extent) on the EBPAS are derived from the four subscales, reflecting general attitudes toward adopting EBP: *Appeal, Requirements, Openness, and Divergence*. The EBPAS also yields a *total scale score. Appeal* – This subscale measures how likely a participant would be to adopt EBP if the practice made intuitive sense; they would adopt them because they see the way the practice fits into their current teaching. *Requirements* – This subscale represents the extent to which teachers would adopt an EBP given the direction by their supervisors to do so. *Openness* – This subscale addresses to what extent the practitioner is in general to new interventions or EBP. *Divergence* – this scale reflects to what extent the participants believe the EBP is similar to the current practice being used. The subscales reflect the theoretical domains found in the literature (Stahmer & Aarons, 2009; Odom & Boyd, 2006; APA Presidential Task Force on Evidence-Based Practice, 2006). Table 5 displays the Subscales of the EBPAS.

Table 5

Evidence-Based Practice Attitude Scale (EBPAS) Components

Subscales	Questions and Statements
Requirements: the extent to which teachers would adopt an EBP given direction from leadership	
	Likelihood if it was required by supervisor
	Likelihood if it was required by agency
	Likelihood if it was required by your state
Appeal: the extent to which teachers would adopt an EBP if it made intuitive sense to them	
	Likelihood if it was intuitively appealing?
	Likelihood if it "made sense" to you?
	Likelihood if it was being used by colleagues who were happy with it?
	Likelihood if you felt you had enough training to use it correctly?
Openness: the extent to which teachers are open to new and/or EBP	
	I like to use new types of therapy/interventions to help my clients.
	I am willing to try new types of therapy/interventions even if I have to follow a treatment manual.

Table 5

Evidence-Based Practice Attitude Scale (EBPAS) Components

Subscales	Questions and Statements
	I am willing to use new and different types of therapy/interventions developed by researchers.
	I would try a new therapy/intervention even if it were very different from what I am used to doing.
Divergence: the extent to which teachers believe the EBP is similar to currently used practice	
	I know better than academic researchers how to care for my clients.
	Research based treatments/interventions are not clinically useful.
	Clinical experience is more important than using manualized therapy/interventions.
	I would not use manualized therapy/interventions.

The EBPAS was initially developed for social service workers (e.g. social worker) who specialize in children and adolescents to determine their understanding of which practices were grounded in evidence as well as their attitude toward such practices. The instrument is robust and flexible; hence it is also appropriate for examining teacher's attitudes towards various methods they are using in their programs. A copy of the EBPAS is in Appendix A.

When looking at the psychometric properties of the EBPAS, Aarons (2004b) and Aarons, McDonald, Sheehan, and Walrath-Greene (2007) determined that Chronbach's alpha reliability (α=.79) was good for the total score with the EBPAS subscales ranging between .93 to .66 (Aarons, Sommerfield, & Walrath-Greene, 2009). The EBPAS validity is supported by studies connected to organizational change (Aarons, 2004b), adoption of EBP (Henggeler, Chapman & Rowland, 2008), climate and culture (Aarons & Sawitzky, 2006) and early intervention autism providers and mental health providers (Stahmer & Aarons, 2009).

Fidelity measures associated with the different models were used to measure the manner in which participants used the three approaches in the three types of preschool classrooms. The LEAP and TEACCH models each have their own treatment fidelity measures; and a fidelity

measure created by the National Professional Development Center on Autism Spectrum Disorders (NPDC, 2010) was used for the BAU classrooms. For the purposes of the study the three fidelity treatment measures were evaluated via use of a 5-point Likert scale.

LEAP Model. LEAP is a comprehensive treatment model for young children with ASD. It was developed in 1981 by Phillip Strain. LEAP uses the theoretical framework of applied behavioral analysis (Cooper, 1982), albeit in a more naturalistic classroom format (Strain & Cordisco, 1994). LEAP was originally funded as a model demonstration program through the U.S. Department of Education's Handicapped Children's Early Education Program (Coman, 2010). LEAP programs typically have three to five year old students; three to four students with ASD and eight to ten typically-developing preschool peers typically comprise a class. The programs are usually staffed with three to four adults including those with roles as special education teachers, speech and language pathologists, occupational therapists, paraeducators and early childhood teachers (Strain & Schwartz, 2010).

A strong tenant of the LEAP model is the systematic inclusion of parents as part of the ongoing team. Family training specific to autism is included as part of the LEAP model, including nine modules of behavior support strategies (Strain & Schwartz, 2010).

A LEAP classroom, by design, has several features that make it unique. These features include (1) the use of typical preschoolers who have been taught to facilitate social and language interactions for children with ASD, (2) embedding IEP objectives into already existing routines, and (3) comprehensive family training to assist with behavior in home and community events (Strain & Bovey, 2011).

LEAP Model Fidelity Measure. *LEAP Outreach Project Program Quality Guidelines* is the fidelity of treatment guide developed by Strain and Bovey (2006), using a Likert scale for the following eight sections (38 total items plus a summary score): (1) Classroom Organization &

Planning – this component assesses overall organization and maintenance of the environment, including materials and physical structures. Included are indicators about the routines and schedules being posted and utilized so all staff and students who enter the program understand the sequence of activities. Daily routines, transition procedures, predictable song sequences, labeled shelves and toys, interesting themes and the awareness of roles should all be observed in this component for the highest score. (2) Teaching Strategies- These indicators reflect instructional practices utilized for one-to-one teaching, small group, and large group, based on use of naturalistic teaching strategies. Indicators address content being generalized with logically occurring antecedents and consequences while using task analysis, repetition, modeling and imitation as established strategies for students with ASD. (3) Teaching Communication Skills- This component comprises indicators addressing naturalistic teaching strategies, individual communication systems and a program supporting total communication across activities, day and people, and opportunities for interactions. (4) Promoting Social Interaction – This element of the assessment asks if there is evidence of typically developing peers and are the environments and activities designed to encourage social interaction with direct instruction of social skills? (5) Providing Positive Behavioral Guidance – Observations in classrooms show evidence of rules being established and enforced while also teaching students self-control and encouragement to discuss and express emotions. Principles of staff giving appropriate directions relative to tone, pacing and prompting are evidence of the indicators, with a high score as well as classrooms implementing a variety of effective behavior management strategies used to increase positive behavior and reduce problematic behavior. (6) IEPs and Measuring Progress (Data Collection)- An effective data collection system used to inform program decisions, using accessible data sheets by all staff working in classroom is the overarching principle within this section. (7) Interactions with Children- Indicators in this section reflect meaningful relationships with

children who learn how to develop self-esteem and show sensitivity to other children, while also encouraging autonomy (self-determination). 8) Interactions with Families – This section includes indicators that address the relationship forged with the parent by the classroom staff, including back and forth communication, family training, and involving parents in the classroom as active team members. A copy of the LEAP model fidelity measure is in Appendix B.

TEACCH Model. TEACCH was developed by Eric Schopler, a psychologist from the University of North Carolina, in 1972, as a system for teaching students with ASD. This model, also commonly referred to as "Structured Teaching" is designed to provide instructional and environmental supports based on the core features of autism (Mesibov & Shea, 2010). Coman (2010) synthesized the literature evaluating TEACCH and found it is primarily based upon cognitive social learning theory.

TEACCH Model Fidelity Measure. TEACCH staff developed a fidelity of treatment guide, *Structured Teaching Checklist-Revised* (Grindstaff, et.al 2006). The scale uses a 5-point Likert format (5 = Full Implementation, 1 = Minimal/No Implementation), including 31 items across 9 domains. These items generate a total score. The 9 domains include: (1) Physical Structure – This domain looks at the physical environment of the classroom with specific interest in areas being defined, materials that are easy to locate, and well organized materials which are labeled. (2) Visual Schedules – This domain examines the overall classroom schedule and individual schedules (e.g., are the schedules prominently displayed with visual transition cues obvious to the observer). Students should be taught how to use visual schedules with a focus on independent use of the tool. (3) Work Systems – This domain assesses work systems. Specifically the observations focus on answering four basic student-oriented questions: What work do I do? How much do I do? When am I finished? And what activity do I do next? This particular assessment also focuses on determining if the supports are used throughout the day. (4)

Visual Structure – This domain focuses on assessing if tasks and activities are visually meaningful to the students. (5) Assessment and Teaching Time - This domain looks at whether or not teaching goals and activities are designed to match student's developmental level, strengths and needs. The assessment puts an emphasis on independence and generalization of skills, following a logical sequence of instruction. (6) Communication – This domain focuses on receptive and expressive needs, including if they are taught with appropriate systems in place and utilized across environments. (7) Social and Leisure – This domain is designed to evaluate social skills training, including whether positive interactions and leisure skills are matched to student interests. (8) Behavior Management – This domain addresses behaviors, specifically an understanding of the culture of autism with interventions designed and implemented around individual student developmental level and need. (9) Family Involvement – This domain determines if families are involved and welcomed in the classroom and collaboration with families is a priority *(*Welterlin, 2009; Mesibov & Shea, 2010; Hume et al., 2011). A copy of the TEACCH model fidelity measure is in Appendix C.

BAU Model: This model does not adhere to a particular autism theoretical or conceptual foundation. Nonetheless it typically involves use of components from LEAP, TEACCH, and other models. In this *"Business As Usual"* model, teachers used multiple methods to educate students with ASD (Hume et al., 2011).

BAU Model Fidelity Measure: The Professional Development in Autism (PDA) Center developed a Likert Scale (5 = Full Implementation, 1 = Minimal/No Implementation) assessment to describe practices utilized in traditional eclectic classrooms (i.e., BAU for purposes of this study). Items (54 total) were organized into 8 sections: (1) Teaming – This domain looks at how teams collaborate for decision making and individual student planning. (2) Classroom Structure- These items refer to daily schedules for classrooms and individuals, adequate preparation for

transitions for students, choice making, student engagement, use of para-educators, data collection and the roles and responsibilities of all team members. (3) Classroom Environment – The physical structure of the classroom is evaluated for clarity of routines, condition of materials, communication devices and their use, and teacher-student ratio. (4) Curriculum and Instruction – IEP development specific to ASD is evaluated as well as specialized instruction needs; and content and delivery, including feedback and reinforcement provided to students. (5) Social/Peer Relationships – This evaluation focus on use of instruction for peer relationships and interactions, including range of evidence –based instructional strategies for social skills training. (6) Challenging Behaviors – This domain examines strategies for teaching replacement behaviors and determining functions of behavior, including use of reinforcers and instructional strategies that use a hierarchy of prompts.(7) Family Involvement – This section examines what system is in place for regular communication with families and how is that system is received by families. (8) Building a Positive Climate – This evaluation focuses on whether students are greeted individually, are shown respect, consideration and warmth, and the extent to which staff convey acceptance of individual differences through diverse planning (Odom & Boyd, 2006; NPDC, 2010). A copy of the BAU model fidelity measure is in Appendix D.

Procedures

This study was an independent dissertation study which was part of a national multi-state preschool study, *Comparison of Two Comprehension Treatment Models for Preschool-aged Children with Autism and Their Families* (Principal Investigator, Odom, S.;IES: R324B070219). Given that Human Subjects approval was granted through the larger study for each participating state, the University of Kansas Human Subjects Committee did not require additional approval since there were no additional participants or measures used.

The 73 teachers (previously described above) were asked to complete the EBPAS online using a web-based platform. The online responses were kept electronically. In addition to the EBPAS, the preschool teachers completed a Teacher Enrollment form which included demographic information for each of the respondents. Items included race, ethnicity, highest degree earned, total number of years teaching, total number of years teaching in a LEAP, TEACCH or BAU classroom as well as other demographic information; this information is summarized in Table 4, earlier in the chapter.

Information was systematically collected on the treatment fidelity from the respective TEACCH, LEAP and BAU measures. These assessments were completed by the study author at each Colorado site four times per year (two in the fall and two in the spring); two of these observations were to ensure inter-rater reliability. The study author observed in the classrooms for a complete preschool session (3.5 hours), interviewed the teachers and then completed the appropriate *Structured Teaching Checklis*t, the *LEAP Outreach Project Program Quality Guidelines,* or the *PDA Program Assessment*. The fidelity measures were scored immediately following the observations in the preschool classrooms. Project researchers from Florida, Minnesota and North Carolina followed the same protocol that was conducted in Colorado. Initial training on the three instruments was conducted in the four states by staffs that had experience with the different models. An inter-rater reliability agreement was calculated with Cohen's Kappa for agreement within one point, with .85 being the accepted minimum criteria.

Data from participants' EBPAS scores were extracted from the Institutes of Education Science (IES) study, *Comparison of Two Comprehensive Treatment Models for Preschool-aged Children with Autism and Their Families.* From the same study, participants' scores from the three treatment fidelity measures (LEAP, TEACCH, BAU) from the four participating states (Colorado, Florida, North Carolina and Minnesota) were also utilized.

Four data bases were developed based on the 73 preschool teacher participants. Databases included demographics and EBPAS scores, LEAP fidelity scores, TEACCH fidelity scores and BAU fidelity scores. The EBPAS scoring (four subscales and a total) in the database included the responses from one of the two scoring opportunities. The majority (approximately 90%) of the scores were taken from the end-of-the-year responses while approximately 10 % was from the first reporting period at the beginning of the school year. The difference was due to seven teachers not having an end-of-the-year score for the EBPAS. For each of the three fidelity measure databases subscale scores and a total score was used for each of the teacher participants. Given that each participant was observed on four different occasions and two of those occasions had two raters scoring there were a total of six scores for each item on the fidelity measures. These observation scores were averaged into one score for each of the subscales and total.

Data Analysis

The primary research questions for this study were:

1. What group differences exist among teachers on an evidence-based attitude scale, *The Evidence-Based Practice Attitude Scale* (EBPAS) (Aarons, 2004a), who work in settings that use three different preschool models (TEACCH, LEAP and BAU)? Teachers using the three preschool models were compared using the overall EBPAS score and the four EBPAS subscale scores.
2. What relationship exists between teacher's score on the EBPAS and scores on the fidelity measure of the classroom model being used?

In an initial step, descriptive statistics, including means and standard deviations for continuous data were calculated to describe the socio-demographic characteristics of the study sample. Responses obtained from the on-line EBPAS were coded into a database and coding accuracy was checked for correctness. Next, reliability of the four instruments was assessed by

Cronbach's coefficient alpha. This measure of internal consistency reliability indicated the extent to which scales/subscale items were interrelated. A Pearson's correlation coefficient was computed to examine the relationship between the EBPAS and each of the fidelity measures (LEAP, TEACCH, BAU). Finally, analysis of variance tests were conducted to compare the three independent groups, i.e., LEAP, TEAACH and BAU, relative to participants' EBPAS scores and the three treatment fidelity measures. The analysis of variance alpha criterion was .05.

Chapter 4

Results

This study was conducted (a) to determine if group differences existed among teachers working in comprehensive treatment model preschool classrooms on an evidence-based practice attitude scale and (b) to evaluate the relationship between teachers' scores on the attitude scale and the scores of the fidelity measurement linked to their particular classroom model. Thus, the purpose of this study was to examine the attitudes teachers have toward adopting evidence-based practices. Data were collected from teacher participants from an online, web-based platform with the *Evidence-Based Practices Attitude Scale* and by direct observations from the study author and other researchers from three states using the fidelity measurement tools. Data and related information related to addressing these two topics is presented in this chapter.

Internal consistency reliability

Prior to performing analysis, the internal consistency reliability estimates of the instruments were examined using Cronbach's alpha. This is important because low reliability blunts relationships between variables and makes group differences harder to detect (Crocker & Algina, 2006). Cronbach's alpha coefficients range between 0 and 1 and the closer the coefficient is to 1, the greater the internal consistency of the scale items (Henson, R. K. 2001).

Cronbach's alpha reliability for the Evidence-Based Practice Attitude Scale (EBPAS) instrument, over all of the teachers with complete data in the sample (n = 73), was 0.79. For the LEAP fidelity measure, Cronbach's alpha for the LEAP teachers (n = 22) was 0.96. For the TEACCH fidelity measure, Cronbach's alpha for the TEACCH teachers (n = 24) was 0.95. For the BAU fidelity measure, Cronbach's alpha for the BAU teachers (n = 27) was 0.95.

These findings were consistent with previous studies looking at reliability estimates (Aarons, 2004; Aarons, et al. 2007: Aarons, et. al, 2009; Henggeler, et. al. 2008) for the EBPAS. Internal consistency reliability was computed using Cronbach's alpha on the LEAP (.934) and TEACCH (.932) fidelity measures during Phase 1 of the larger, multi-site study with similar findings (Hume, et. al, 2011). The internal consistency reliability estimates of the scores from these instruments were deemed to be sufficient for further analysis.

Research Question One: Analysis of group differences

Research question one, examining group differences among teachers on the EBPAS, was analyzed using descriptive and inferential statistics. In order to test for differences in the self-reported use of evidence-based teaching practices, a series of one way ANOVAs were fit to the EBPAS overall score and each of its subscales to answer research question one. The alpha criterion for these tests was set to $\alpha = .05$ and the tests were unadjusted for multiple comparisons. Statistically significant ANOVAs were to be followed by pairwise contrasts if significant differences were found during the analysis. Descriptive statistics can be found in Table 6, including the mean and standard deviations, which were calculated from the EBPAS.

Table 6

Descriptive Statistics for EBPAS Overall and Subscales by Model

Descriptive Statistics

Model	Variable	N	Mean	SD	Min	Max	Coefficient
BAU	EBPAS overall	27	3.21	0.39	2.13	3.87	0.95
	EBPAS requirement subscale	27	3.37	0.68	2.00	4.00	
	EBPAS appeal subscale	27	3.52	0.51	2.00	4.00	
	EBPAS openness subscale	27	3.05	0.64	1.75	4.00	
	EBPAS divergent subscale	27	1.05	0.47	0.00	1.75	

LEAP	EBPAS overall	22	3.19	0.45	2.07	3.93	0.96
	EBPAS requirement subscale	22	3.24	1.07	0.00	4.00	
	EBPAS appeal subscale	22	3.52	0.48	2.50	4.00	
	EBPAS openness subscale	22	3.22	0.63	2.00	4.00	
	EBPAS divergent subscale	22	1.22	0.77	0.25	3.00	
TEACCH	EBPAS overall	24	3.11	0.30	2.47	3.67	.95
	EBPAS requirement subscale	24	2.72	1.18	0.00	4.00	
	EBPAS appeal subscale	24	3.60	0.38	2.75	4.00	
	EBPAS openness subscale	24	3.26	0.61	1.75	4.00	
	EBPAS divergent subscale	24	1.25	0.71	0.50	3.00	

The range of mean scores on the fidelity measures for the EBPAS overall score was between 3.11-3.21. The subscale means across the three models ranged between 2.72 and 3.60.

Results for the ANOVAs can be found in Table 7. Given the significance value was greater than .05 ($p > .05$) on all comparisons, it was inferred that the statistically non-significant differences between group means were due to chance. EBPAS scores from the teacher participants and the three treatment model fidelity measures were compared using a between subjects one way ANOVA. The three factors were TEACCH, LEAP and BAU scores based on researcher observations. All comparisons were statistically non-significant ($p > .05$), indicating that attitudes teachers have toward using evidence-based practices did not significantly vary across models.

Table 7

ANOVA results		
Outcome	F (2, 70)	p
EBPAS overall	0.51	0.61
EBPAS requirement subscale	2.99	0.06
EBPAS appeal subscale	0.27	0.77
EBPAS openness subscale	0.84	0.44
EBPAS divergent subscale	0.72	0.49

Research Question Two: Analysis of relationships between evidence-based practice use and teaching fidelity

Descriptive and inferential statistics were both used to address research question two, examining a relationship between scores on the EBPAS and scores on the fidelity measures. A series of Pearson correlation coefficients were used to test for relationships between these two constructs (attitudes for evidence-based practices and teaching fidelity). The range of values for the Pearson correlation coefficient is from -1 to 1 with a value of 0 indicating there is no association between two variables. Thus Pearson correlation coefficients test the strength of the relationship between variables. When a value is greater than 0, a positive association is indicated; as the value of one variable increases so does the value of the other variable. When the value is less than 0, a negative association between the variables is concluded; one variable increases, the other decreases (Taylor, R. 1990).

Results for the Pearson correlation coefficient analyses can be found in Table 8. The only statistically significant ($p < .05$) correlation was between the *Divergence* subscale on the EBPAS and the scores on the BAU fidelity measure ($r = -0.51$, $p = .007$). The *Divergence* subscale is a

measure of attributes that are perceived to be less useful than the current practice respondents are currently using or less useful than their perceived teaching expertise or experience. All other correlations were statistically non-significant.

Table 8

Summary of Relationships between EBPAS Scores and Scores on Fidelity Measures

	TEACCH fidelity total	LEAP fidelity total	BAU fidelity total	Overall fidelity
EBPAS overall	0.10	0.31	0.14	0.19
EBPAS requirement	0.29	0.31	-0.06	0.23
EBPAS appeal	0.09	-0.15	-0.09	-0.06
EBPAS openness	-0.09	0.25	0.05	0.06
EBPAS divergent	0.17	-0.24	-0.51 *	-0.13

Note: * indicates $p < .05$. Sample sizes for the TEACCH, LEAP, BAU, and Overall fidelity correlations were n=24, 22, 27, and 73, respectively.

Descriptive statistics related to research question two may be found in Table 9, including the mean and standard deviations on the EBPAS scores (overall and subscales) and the fidelity scores (overall and each model). The *Divergence* subscale contained questions that were negatively-keyed items. Negatively-keyed items are ones in which the statement is phrased so that an agreement of the question represents a lower level of the attribute being measured. Positively-keyed items are worded so that there is agreement with the item that represents a higher level of the attribute being measured. For the *Divergence* subscale, there are four questions that are negatively-keyed. For the *Divergence* subscale, this would be an attribute that is perceived to be less useful than the current practice respondents are currently using or less useful than their perceived teaching expertise or experience. For example, question 5 states: "Research based treatments/interventions are not clinically useful". For this question a score of 5

would indicate the teacher is in complete agreement that a particular strategy is not useful. The negatively-scored items were reverse scored before determining a teacher's total score. This was done to ensure that high scores on the scale are indicative of higher levels of the attribute being measured.

Table 9

Descriptive Statistics for EBPAS and Fidelity Measures

Variable	n	Mean	SD	Min	Max
EBPAS overall	73	3.17	0.38	2.07	3.93
EBPAS requirement subscale	73	3.12	1.01	0.00	4.00
EBPAS appeal subscale	73	3.55	0.46	2.00	4.00
EBPAS openness subscale	73	3.17	0.63	1.75	4.00
EBPAS divergent subscale	73	1.16	0.65	0.00	3.00
TEACCH fidelity	24	4.24	0.43	3.25	4.78
LEAP fidelity	22	4.52	0.37	3.73	4.89
BAU fidelity	27	4.29	0.38	3.20	4.83
Overall fidelity	73	4.35	0.41	3.20	4.89

Summary

A series of one-way ANOVA results indicated that there were not group differences between the three types of ASD preschool classroom models and the attitudes teachers have toward adopting evidence-based practices. Whether a teacher was in a LEAP, TEACCH or BAU classroom had no statistically significant bearing on their willingness to adopt methodology judged to be based on research-based preschool methods. Additionally, when Pearson correlation coefficients were conducted, there were no statistically significant relationships found between the two variables on 14 out of 15 analyses. The exception to this finding was the statistically

significant relationship between the *Divergence* subscale and the BAU fidelity measure (r= -*0.51, p=.007*).

Chapter 5

Discussion and Conclusions

With the current demand on public school systems to meet the increasing service needs of students with autism spectrum disorders (ASD), including selecting evidence-based practices, employing teachers who adopt and implement those practices becomes increasingly imperative. To meet the pressing need to establish comprehensive autism treatment programs and services teachers have to be willing to learn new skills and strategies that all too frequently are not taught in their pre-service college programs. Prior to teachers learning a new skill though, they have to be willing to adopt established effective practices that have been proven effective with learners diagnosed or identified with ASD and examine their own attitude regarding their willingness to take on the task of learning and implementing optimally effective practices. Schools have been charged with the task of employing highly qualified teachers, according to the NCLB Act (NCLB, 2001). Schools must then discern how highly qualified teachers are selecting evidence-based practices and what factors inform their decision for selection of teaching methods.

The purpose of this study was to gain a better understanding about the attitudes teachers have toward adopting evidence-based practices. In addition, this study aimed to determine if teachers working in a specific treatment model classroom (e.g. LEAP – Learning Experiences Alternative Program for Preschoolers and their Parents) demonstrated differences when compared to teachers working in another model-type classroom (e.g. TEACCH – Treatment and Education of Autistic and Communication handicapped CHildren) relative to adopting evidence-based practices. Instruments used to address these questions included: (a) the *Evidence-Based Practice Attitude Scale* (Aarons, 2004a); (b) the LEAP Outreach Program Quality Guidelines (Strain & Bovey, 2006); (c) the Structured Teaching Checklist– Revised (Grindstaff, Wall,

Turner, Boyd, & Mesibov, 2006); and (d) PDA – Program Assessment (Professional Development in Autism Center, n.d.).

This study examined the attitudes teachers had toward adopting evidence-based practices. Seventy three (73) teachers completed the *Evidence-Based Practice Attitude Scale* on a web-based platform. Teachers responded to items across four dimensions: *Appeal, Requirements, Openness,* and *Divergence*. These teacher respondents were part of a larger, multi-state study which focused on the comparison of comprehensive treatment model preschool programs and as such belonged to one of three groups: 1) LEAP preschool classroom, 2) TEACCH preschool classroom, 3) BAU (Business as Usual) preschool classroom. Data were analyzed for the attitudes teachers had toward adopting evidence-based practices and whether group differences existed among the teachers on the 15-item *EBPAS*.

Relative to teacher attitudes across the three treatment models, all comparisons were non-significant. This finding was interpreted to mean the adoption of research-based practices did not vary across the models. In other words, differences were not found simply because a teacher worked in a LEAP versus a BAU versus a TEACCH classroom.

In addition to group differences that were examined, the existence of a relationship between the teachers' attitudes and the model-specific fidelity measure (i.e. LEAP with *EBPAS*, TEACCH with *EBPAS*, and BAU with *EBPAS*) was analyzed. All correlations between the two constructs were not statistically significant with the exception of BAU fidelity and the subscale *Divergence* on the *EBPAS*. Data and results are discussed in the Discussion section that follows.

Discussion

In this section the results of this study are discussed and interpreted, as they relate to the extant literature. Research question one focused on the attitudes teachers who were working in variable program models had towards adopting evidenced-based practices. The analysis was

done to see if there were any differences between the LEAP, TEACCH and BAU classrooms on the variable EBPAS. The results for research question one indicated there were no differences for the population means across the three groups. Thus there were no statistically significant ($p<.05$) EBPAS differences linked to classroom models for the three conditions (LEAP, TEACCH, BAU). The four assessment categories used to examine the adoption and dissemination of evidence-based practices included the intuitive *appeal* to the teacher a new practice held for them personally; the *requirements* their particular school or district had toward implementing particular practices; and the *openness* the individual teachers had towards utilizing new practices in general. Finally the *divergence* subscale assessed the extent to which the teacher perceived an evidence-based practice as not useful and less important than their own teaching expertise.

These results can generally be interpreted to mean that independent of the treatment model participants taught in, differences on the EBPAS were not present. The questions on the EBPAS were intended to determine the feelings teachers had toward using new types of treatments or interventions that had specific guidelines and procedures as to how each treatment should be implemented. These results suggest that teachers' attitudes did not have an effect on which treatment model they were basing their teaching upon. As previously stated, the three model classroom programs were selected based on their high quality of teaching, program implementation and adherence to a comprehensive treatment model and the results on the EBPAS did not reveal a significant difference between the three groups, suggesting that the model type did not impact the teachers' attitude toward adopting evidence-based practices.

Stahmer, et al (2009) looked at the adoption of evidence-based practices with two different groups (education based early intervention providers and mental health providers) and found participants differed significantly on all four subscales and the total score on the EBPAS.

Both groups of providers worked with young children with ASD. The study looked at the context differences between those working in an education-based environment (in-home and center-based settings) and those working in a public mental health system. Although different in study design, this finding is interesting and promotes more questions to be studied relative to groups being compared, participants within the groups and specific differences on each of the subscales.

The teacher participants in this study of model preschool classrooms had significantly higher scores on the EBPAS (total score *M*= 3.171) when compared to the early intervention providers (*M*= 2.951) and the mental health providers (*M*= 2.755) from the Stahmer study (2009). This suggests more global positive attitudes toward adoption of evidence-based practices for students with ASD. Overall, the scores for the early intervention education providers were higher on the *Appeal*, *Openness* and *Requirements* subscales than were the mental health provider scores, indicating a more favorable likelihood of the adoption of the evidence-based practices by the education-related providers (Stahmer et al, 2009). The *Divergence* subscale delineated similar findings indicating that the early intervention providers were less likely than the mental health providers to perceive evidence-based practices as less important than their current clinical practice (indicated by lower scores) and therefore more likely to adopt practices that may be different than those they are currently using.

The scores from the teacher participants in this preschool treatment study are at a higher level than the participants from the Stahmer study, both early intervention providers and mental health providers, suggesting a greater willingness to adopt evidence-based practices in all areas. Once again, the significance of the teachers from the current study teaching in classrooms that were demonstrating a high level of quality teaching as demonstrated by the fidelity measures seems to contribute to this finding. When comparing only the education-related service providers (preschool teachers from this dissertation study and early intervention providers from Stahmer),

both sets of the subscale scores are similar in their order of willingness to adopt evidence-based practices; meaning if they were both ranked, the subscale order based on scores would be *Appeal*, *Openness* and *Requirement*. (See Table 10, Comparison of Dissertation Study and Stahmer Study EBPAS Scores)

Table 10

Comparison of Dissertation Study and Stahmer Study EBPAS Scores

	Dissertation Study		*Stahmer Study*	
	N	Mean	N	Mean
EBPAS TOTAL	74	3.17	71	2.95
EBPAS REQUIREMENT	74	3.13	71	2.87
EBPAS APPEAL	74	3.55	71	3.26
EBPAS OPENNESS	74	3.17	71	2.88
EBPAS DIVERGENCE	74	1.16	71	1.20

This finding seems to indicate teachers and education-related providers adopt practices first that are more intuitively appealing or practices that seem to make sense to them followed by practices that are required by an organization or agency.

Aarons, et al (2009) did not compare groups on the EBPAS but did look at how the type of organization, specifically public versus private, impacted the implementation of evidence-based practices relative to attitudes of the mental health participants. In the Aarons study the researchers were examining the impact of organizational type on mental health provider attitudes toward the adoption of evidence-based practices. The researchers found that the organization type did result in differences between private and public organizations. EBPAS total scores for public sector (M = 2.6) and private sector (M= 2.8) were lower than were the preschool treatment participant scores (M= 3.17). These scores would indicate that teachers in the high fidelity preschool treatment classrooms were more likely to adopt evidence-based practices than the

participants in the Aarons (2009) study that focused on examining organizational culture. The preschool teachers all were employed in public sector organizations where the organizational supports were already established by the school districts.

The intent of research question two was to determine what relationships existed between the scores on the EBPAS and scores on the three fidelity measures. To answer this question, a series of Pearson correlation coefficients were used to determine the strength of the relationship between two constructs (teaching fidelity and the attitudes teachers have toward adopting evidenced-based practices). The table of descriptive statistics (Table 9, Chapter 4) shows the average EBPAS score was 3.17 and the subscale with the highest average (3.55) was *Appeal*. The higher average suggests a greater agreement with the subscale items within the *Appeal* domain than with the other domains, perhaps meaning a teacher would be more willing to adopt an evidence-based practice if she found the practice more intuitively appealing, if the selected practice could be used as designed by the developer or if the teacher knew colleagues who were happy with the practice (Aarons, et al 2007). There were similar findings with the *Openness* and *Requirement* domains for teachers as well (M= 3.168 and M= 3.119 respectively). That is, teachers in the LEAP, TEACCH and BAU classrooms were likely to adopt evidence-based practices because they are open to new practices and interventions as well as when they are required to do so by their school district. Table 9 also reveals the overall mean score for the fidelity measures is 4.35, with LEAP representing the highest average of 4.52 (n= *73*). When looking at the associations of the two variables in the data reported, LEAP fidelity and the EBPAS *overall* had the strongest positive relationship (r= .31) and BAU fidelity and the EBPAS *divergence* subscale had the strongest negative relationship (r = -.51) of any of the pairings. However both of those correlations fall into the category of weak to moderate (respectively) relationships relative to their degree of association. This one statistically significant finding

could be a false positive given the number of analyses conducted. Considering the weak association between the *Divergence* subscale and the BAU fidelity scores, there is little to suggest a logical alternative reason for this finding. This also could be the result of trying to estimate what a correlation might be in a small sample size of 24.

The only statistically significant ($p < .05$) correlation was between the *divergence* subscale on the EBPAS and the scores on the BAU fidelity measure ($r = -0.51$, $p = .007$), which also is the strongest negative correlation. The construct itself, *divergence,* is different from the other subscales that the EBPAS is designed to measure. The other subscales (*appeal, openness,* and *requirements*) include items that increase as respondents become more open to adopting evidence-based practices. In contrast, the higher the *Divergence* score the less value respondents place on evidence-based practices. Relative to the *Divergence* subscale score, lower scored items are more desirable, indicating more openness to adopting evidence-based practices.

Implications of Study

With prevalence numbers on the rise for students identified as having an ASD, school districts need to determine how they are going to meet this increased demand when planning for and implementing programs and procedures. This study examined three specific models for serving students with ASD and the components that each comprises. Each of the models started with an established pedagogy that teachers were expected to adhere to when teaching in one of these classrooms. These classrooms were all high quality programs, as rated by program specific fidelity measures. When program development begins with high-quality elements in the design there is a greater likelihood that the instructional components such as social skills implementation, environmental structure, and family partnerships will have greater impact on student and family outcomes. Significant differences across the three models were not seen when looking for quality program evidence. It is important to remember that the teachers

involved in this study were implementing their classroom model at higher levels of fidelity as compared to teachers in the general population. Since the classrooms in this study were selected for the overarching national study which had the inclusion and exclusion criteria identified, teachers were part of an already existing high fidelity classroom. Inclusion and exclusion criteria specifically addressing this high quality issue were: 1) LEAP model and TEACCH model teachers had formal training specific to their model by the model developers; 2) LEAP and TEACCH model teachers operated at a high level of fidelity on the respective fidelity measure for their respective program models, as recommended by the model developers (Strain & Bovey, 2006; Mesibov et al., 2005); and 3) LEAP and TEACCH teachers had implemented the comprehensive model in their respective classrooms for at least two years. BAU teachers were required to have taught in a preschool classroom for children with autism for at least two years.

In many ways those components (e.g. social skills, environmental structure) are inherent in good instruction, and thus independent of specific program models, relative to classroom programming. When school districts or agencies are tasked with the development of ASD programming, using the programmatic elements of LEAP, TEACCH or BAU can be expected to provide a strong foundation. Given the results of this study as well as related research (Hume et al, 2011; Coman et al, 2013; Boyd et al, 2014) examining these three models, teachers should be able to employ the multiple programmatic elements that have been found effective across the different models reviewed while designing an effective program for children with ASD.

These specific focused interventions alone may not be what produces the positive outcomes, but rather the use of multiple interventions as part of a comprehensive treatment model incorporating multiple strategies based upon a theoretical underpinning supporting ASD practices. Comprehensive treatment models (CTMs) and focused interventions are two categories of intervention. Focused interventions are specific strategies that can be defined and

utilized to provide a direct, behavioral or developmental outcome for students with ASD (Odom, Boyd, Hall, & Hume, 2010). When used in practice, these interventions are implemented for a finite period of time with the specific intent of producing a desired change for a particular behavior. It is common for educators to use multiple focused interventions for a myriad of desired behavioral or developmental changes. Examples of focused interventions include; discrete trial teaching, visual supports, social scripting, verbal behavior analysis and structured teaching. In addition to focused interventions, the second category of intervention is the CTMs, which differ from the focused interventions in term of scope, intensity and magnitude. CTMs can be described as a grouping of interventions and practices put in place as a complete unit to be carried out over a longer period of time (e.g. school year). CTMs are designed for broader learning and not an isolated target behavior for students with ASD (NRC, 2001; Odom, Boyd, Hall, & Hume, 2010). Examples of CTMs include: TEACCH; LEAP; and SCERTS models.

There is a gap that exists from research to practice when looking at the dissemination and implementation of evidence-based practices being established in child-centered environments such as schools and mental health programs (Stahmer and Aarons, 2009; Aarons et al, 2009).

Limitations of Study

This study initiates an essential discussion into the research on attitudes teachers have towards adopting evidence-based practices in classrooms for students with ASD. With more studies being conducted on specific evidence-based practices in the ASD field, there is a need to look deeper into the implementation of those practices and whether a teacher's attitude impacts implementation. There are several aspects of this study that would benefit from improved methods. First, this study only included 73 teachers and thus future research would benefit from a larger sample size. To increase the sample size participants could come from more than four

states and could also include other licensed personnel (e.g. speech and language pathologist, occupational therapist) who are expected to carry out ASD-focused evidence-based practices.

Second, the participants were selected from classrooms already identified as utilizing strategies that are associated with higher than average classroom practices. Teachers were not randomly assigned and therefore were already implementing strategies at a rate determined to be above average by the project directors for the overarching larger national study. Thus this study did not take into account teachers who were not previously exposed to sound, research based practices in the field of ASD. As a result the EBPAS scores were likely higher than they would be for a randomized experiment study and therefore the generalizability is unknown.

Lastly, this study focused on teachers who had background and training in a specific model type (i.e. LEAP, TEACCH). Thus it did not take into account teachers who were not trained in any specific theoretical or conceptual based programming.

Recommendations for Future Research

This study brought to the researcher's attention multiple follow up studies that could be conducted as an extension to this foundational research in the area of attitudes toward adopting evidence-based practices. This study specifically examined the attitudes in preschool classroom treatment models. Thus one logical next step would be to study the attitudes of elementary, middle and high school teachers working with students with ASD. Secondly, although preschool teachers working in high fidelity classrooms were examined in this study, a next step would be to determine if there were similar findings when assessing the attitudes of teachers who were not necessarily 'high fidelity implementers', that is, teachers who were not necessarily following a designated and structured treatment model. This study reported demographic items such as the number of years teachers had taught, both in ASD classrooms and the total number of years of

service. An area of research that could follow would be to investigate some of these demographic variables and their impact on the adoption of evidence-based practices. For example, would the number of years teachers taught predict the likelihood they would adopt those practices?

Lastly, though not in the area of special education, are there similarities or differences when looking at the likelihood other professions would adopt evidence-based practices? When analyzing different types of organizations (e.g. public versus private sector), what can be learned about the infrastructure that impacts long-term adoption and sustainability? Looking at different elements (e.g. management style of authority; climate of agency; marketing of the evidence-based practice) to organization culture that impact the research to practice gap would be an area that could inform practice for multiple agencies.

Conclusion

Understanding evidence-based practice literature is paramount when developing and implementing programs for students with ASD. Such an understanding is a logical pathway towards a sustainable structure to attract, support and retain effective teachers. In order for that structure to be realized there has to be a systematic understanding of why teachers are adopting required practices and what is keeping them from adopting all of these effective methods. If school districts and other agencies tasked with hiring highly qualified teachers for students with ASD can understand this concept they can put into place effective systems for ensuring that competent teachers are able to deliver programs that lead to optimal student outcomes. These outcomes will be most apt to occur when educators are willing to adopt evidence-based strategies (Wong, et al, 2013).

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APPENDICES