# EVALUATING THE EFFECTS OF A COMMITMENT EMPHASIS CONSULTATION MODEL TO INCREASE TEACHER IMPLEMENTATION OF AUTISM SPECIFIC ASSESSMENT

---

A Dissertation
Submitted to
the Temple University Graduate Board

---

In Partial Fulfillment
of the Requirements for the Degree
DOCTOR OF PHILOSOPHY IN EDUCATION
WITH SPECIAL EDUCATION CONCENTRATION

---

By
Briana M. Bronstein
May 2019

Examining Committee Members:

Matt Tincani, Ph.D., Advisory Chair, Special Education
Allison Gilmour, Ph.D., Assistant Professor of Special Education
Joseph Boyle, Ph.D., Associate Professor of Special Education
David Mandell, ScD., External Member, Professor, University of Pennsylvania

ABSTRACT

There are several effective treatment methods and evidence based practices (EBP) for teaching children with Autism Spectrum Disorders (ASD). The use of EBPs is federally mandated, but it is often overwhelming for teachers to identify and implement available best practices with fidelity in the absence of ongoing training and support (Alexander, Ayres & Smith, 2015). Teachers often display low implementation fidelity, and, specifically, special education teachers often struggle with progress monitoring and data collection, which are essential elements of EBPs. Although most teachers are familiar with direct and frequent measurement for data collection, less than half reported using this type of progress monitoring in their classroom, stating several barriers including lack of time and knowledge (Wesson, King & Deno, 1984). One way to affect teacher implementation and behavior change is through different consultation styles, including performance feedback or a commitment emphasis approach. Performance feedback is a widely used and effective method to improve teacher implementation and treatment fidelity (Burns, Peters & Noell, 2008; Sanetti, & Kratochwill, 2009; Solomon, Klein & Polityло, 2012). A commitment emphasis model is a social influence strategy, which also shows continuing support for teacher behavior change (Noell et al. 2005). This study evaluated a strategy for increasing teachers' completion of the Student Learning Profile (SLP), a curriculum-based student assessment that is administered as part of the Strategies for Teaching based on Autism Research (STAR; Arick, Krug, Loos & Falco, 2004), using a randomized control group design to compare a performance feedback model with a commitment emphasis plus prompt model of consultation. Overall, the study found a significant effect for teacher SLP completion at time-point one for teachers' in the experimental group using a commitment emphasis model, but less so over time. Implications for researchers, clinicians and educators are also explored.

ACKNOWLEDGEMENTS

DEDICATION

I dedicate this work to my family including, my parents and husband. To my husband, Shaun, thank you for taking this journey with me and for supporting me along the way. There is absolutely no way I could have done this without you. Thank you for the countless times you drove me to the library and cared for me. Thank you for your emotional support and for always believing in me. You are always my biggest fan and push me to be better every day.

I am forever grateful to my parents, Rob and Maria, for their love, support, and encouragement throughout this journey, and along every path I have ever taken. Thank you for your unwavering belief in me, for always pushing me to do the best I can, and making me the person I am today. Thank you for enthusiastically celebrating every accomplishment and for taking such pride in me. I'd also like to thank my brother, Robert, as well as my aunts and cousins for their unconditional love and support along this road and throughout my life. Thank you for believing in me.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1

INTRODUCTION

Autism spectrum disorder (ASD) is a complex developmental condition that involves persistent challenges in social interaction, speech and nonverbal communication, and restricted/repetitive behaviors (American Psychiatric Association, 2013). The effects of ASD and the severity of symptoms are different in each person. Diagnosis of ASD is often a challenge, due to possible diagnostic instability or the lack of age appropriate diagnostic criteria for very young children, but can typically be diagnosed by age two, and sometimes as early as eighteen months (Lord et al., 2006). Although children can be diagnosed at an early age, often the signs of ASD go undetected, and other factors such as race/ethnicity and socioeconomic status can cause a delay in diagnosis and treatment (Mandell, Listerud, Levy & Pinto-Martin, 2002).

There are many different effective treatment methods for teaching children with ASD. One review identified twenty-seven evidenced-based practices (EBPs) for individuals with ASD, including interventions based in applied behavior analysis (e.g., reinforcement, extinction, prompting), use of assessment and analytic techniques (e.g., functional behavior assessment), and other interventions which use a combination of behavioral practices (e.g., functional routines, pivotal response training) (Wong et al., 2015). Many of these identified interventions are used in clinical settings, home environments, and public schools serving children with ASD. Some of the above mentioned interventions are compiled into comprehensive treatment models, such as Strategies for Teaching based on Autism Research (STAR) program (Arik et al., 2004) or the Competent Learner Model (CLM) curriculum (Tucci, Hursh, Laitinen & Lambe, 2005). These comprehensive treatment models consist of EBPs that have proven effective for individuals with ASD.  Often, they are provided to teachers in classroom-based settings to

implement with students with ASD. In order for the treatment packages to be successful, formative assessment is critical for evaluating whether interventions are effective. Researchers agree the best way for schools to provide effective educational services for the growing number of students with ASD is by training and supporting teachers on several EBPs, as incorporated into comprehensive teaching packages (Alexander, Ayres & Smith, 2015). Although the use of EBPs is federally mandated, it is often daunting for professionals, including educators, to identify and stay current on the best available practices without training and support (Alexander, Ayres & Smith).

One comprehensive treatment package that has been developed for children with ASD is the STAR program (Arik et al., 2004). The STAR program includes several identified EBPs such as Discrete Trial Training (DTT), Pivotal Response Training (PRT), use of visual schedules, positive reinforcement, and other strategies based on the principles of Applied Behavior Analysis (ABA; Wong et al., 2015). Most comprehensive treatment models, including STAR, also include student assessment, which is necessary to effectively implement the programs based on appropriate student developmental levels. The use of a structured teaching program, such as STAR, paired with increased consultation and training from clinicians and experts in the field, may be hypothesized as an effective method to increase the fidelity and implementation of EBPs for public school teachers (Mandell et al., 2013).

Despite the advantages of comprehensive treatment models that incorporate EBPs, many teachers and school districts may struggle with implementation of EPBs that are time intensive, costly, and require significant training to implement with high fidelity (Arick et al. 2003; Dawson et al. 2010; Lopata et al. 2012). It is even more challenging for teachers who face environmental barriers including decreased financial resources, lack of supplies including

curriculum materials, high staff turnover, poor training for specialized populations and other extraneous variables, such as families living at or below the poverty line (Mandell et al., 2013; Pellecchia et al., 2015). The importance of fidelity of implementation of EBPs for individuals with ASD is imperative to the quality of services the students are receiving, especially in the public-school settings. It is evident that there are many factors, as stated above, which hinder or facilitate to the daily implementation of teaching strategies and interventions into classrooms (Arick et al.; Dawson et al.; Lopata et al.; Mandell et al.; Pellecchia et al.). These barriers become even more prevalent for teachers in special education settings who work with students with severe challenging behaviors. Therefore, it is essential for teachers to receive high quality training and support in order to implement evidence-based practices with fidelity.

Research suggests use of professional development as one approach to improving services to students with ASD enrolled in public school programs (Odom, Cox, & Brock 2013). The National Professional Development Center on ASD suggests the following when implementing programs for teachers in the autism support classroom: (a) identify the content (e.g., program quality, EBPs); (b) plan for and commit to an infrastructure of support at the state and community levels; (c) provide direct training for service providers; and (d) provide ongoing coaching and technical assistance to support teachers and other service providers in their quality improvement and use of EBPs (Odom et al., 2013). Although research suggests professional development and training as an effective model to increase teacher implementation of EBPs, it is likely that this is not enough to promote consistent, high fidelity implementation. For example, Mandell et al. (2013) and Pellecchia et al. (2015) found that even when teachers were provided with intensive training and support on the implementation of the STAR program and the

components including DT and PRT, high fidelity implementation was not achieved for many of the intervention components in these under-resourced urban classrooms.

The work by Mandell et al. and Pellecchia et al. suggest that there are many barriers teachers face in their classroom and teacher training, and that ongoing support is imperative to the successful implementation of EBPs in a classroom-based setting. Due to this identified need, school districts often provide teachers with technical assistance and training on the implementation of EBPs. The current study is part of a larger ongoing consultative project, based on the results of the initial study conducted by Mandell et al. of public school teachers, which focuses on the implementation of EBPs with children with ASD in classroom-based settings. The original study consisted of a randomized field trial comparing STAR and Structured Teaching with educators in 33 kindergarten-through-second-grade autism support classrooms comprised of 119 students, aged 5–8 years, in the School District of Philadelphia. During the trial, researchers provided teachers with 28 hours of intensive workshops at the beginning of the academic year, hands-on training and collaboration from coaches to set up classrooms, and five days of observation and coaching immediately following training, along with three days of follow-up coaching throughout the academic year, and ongoing advising and coaching by e-mail and phone (Mandell et al. 2013). After study completion, the consultative relationship with the School District of Philadelphia continued and the team currently provides consultation on the STAR program and evidence-based strategies for individuals with ASD based on a modified support plan, which includes 13, 1.5-hour visits over the academic year. This consultation is through a partnership between the school district and university, which provides teachers with a year of consultation during their first year of teaching in an autism support classroom in the school district.

One major component of the larger ongoing consultative project is to increase teachers'

completion of student assessment, specifically the STAR Student Learning Profile (SLP). The

SLP is designed to assess students' baseline and subsequent levels of performance to support

instructional planning. The SLP is structured to be completed at least three times a year

(beginning, middle and end). The previous model of consultation was based on a weekly check-

in model (Noell et al., 2005). Weekly follow-up models are conceptualized as corresponding to a

current best practice approach to consulting practice in schools. The weekly follow-up consisted

of a brief follow-up meeting between the consultant and the teacher in which the consultant

asked about the extent to which the plan was implemented and if the teacher had any questions

or concerns (Noell et al.). However, due to the contractual obligations of the current project,

weekly check-ins were not practically feasible, therefore visits now include a follow-up every

three weeks. This approach consists of the consultant asking about the extent to which the plan

(i.e., a target skill identified for the teacher, such as completion of the SLP) was implemented in

the three-week period, and if the teacher has any questions or concerns. Throughout the

consultation year, teachers often fail to complete these baseline assessments as part of the SLP

and, consequently, they do not have the appropriate assessments to plan for instruction or goal

development. This is consistent with previous research, which finds low rates of teacher

implementation of EBPs with sustained fidelity, especially after consultation (Gilbertson, Witt,

Singletary & VanDerHeyden, 2007; Noell et al. 2005). Along with low teacher fidelity, research

has shown that special education teachers often struggle with progress monitoring and data

collection. Wesson, King, and Deno (1984) found that although most teachers were familiar with

direct and frequent measurement (82%), only 43.8% reported using this type of progress

monitoring in their classroom, stating several barriers including lack of time and knowledge on how to use this measurement.

Given the low rates of assessment completion and teacher fidelity, one can argue that this model of consultation, with periodic follow-up visits from consultants, is not enough to ensure teacher implementation of EBPs in the classroom. One way to effect teacher behavior change is through different consultation styles that involve more than follow-up visits. Performance feedback is a widely used and effective method to improve teacher implementation and treatment fidelity (Burns, Peters & Noell, 2008; Sanetti, & Kratochwill, 2009; Solomon, Klein & Politylo, 2012). Another consultation approach is a commitment emphasis model, a social influence strategy, which shows promise as an effective consultation approach when compared to a weekly check-in model (Noell et al., 2005). The commitment emphasis model included all of the elements of weekly follow-up, as well as a social influence procedure. Both performance feedback and commitment emphasis models have been used to increase teacher implementation of classroom-based interventions, but also have implementation and sustainability barriers, such as continuation of implementation post-consultation. One strategy that may address these barriers is implementation prompts. Prompts are reminders to engage in a desired behavior provided before the desired behavior is to occur (Cooper, Heron, & Heward, 2007). Most research on prompts has been with students, but recent studies have shown using teacher prompts as an effective strategy to increase implementation and treatment fidelity (Collier-Meek, Fallon, & DeFouw, 2017; Fallon, Collier-Meek, Kurtz, & DeFouw, 2018).

The current study utilizes a commitment emphasis model of consultation with implementation prompts compared to the use of performance feedback as part of a larger consultative project in the school district to promote teachers' sustained use of EBPs with

fidelity. It is evident that the successful implementation of EBPs as well as appropriate student assessment is important; however, teachers often struggle with fidelity of implementation, given the above-mentioned barriers faced in urban-school environments and special education classrooms. Specifically, in this study, the student investigator sought to evaluate a strategy for increasing teachers' completion of the SLP, a curriculum-based student assessment that is administered as part of the STAR program (Arick et al. 2003). The study utilized a randomized control group design to compare a performance feedback model with a commitment emphasis plus prompt model of consultation. In the study, the following questions were explored:

1. Does the presentation of SLP completion expectations used in the performance feedback plus commitment emphasis and prompt model increase the likelihood of teachers completing SLPs compared to teachers receiving performance feedback only?

2. Do teachers assigned to the SLP performance feedback plus commitment emphasis and prompt model complete the SLP in fewer consultation visits than teachers assigned to performance feedback only?

CHAPTER 2

LITERATURE REVIEW

In this chapter, several areas related to best practices for individuals with ASD will be explored. The chapter will review literature related to evidence-based practices (EBPs) and EBPs specifically identified as effective for individuals with ASD. EBPs are critical in the education and treatment for individuals with ASD and are outlined as required in the Individuals with Disabilities Act (IDEA) and, more recently, in the Elementary and Secondary Education Act (ESEA). The literature review will also explore the use of EBPs for individuals with ASD in classroom-based settings. Specifically, the literature review will summarize strategies such as pre-service teacher training, ongoing professional development for current special education teachers, and consultation and training for staff to increase implementation of EBPs, including the use of both performance feedback and commitment emphasis models of consultation.

Evidence Based Practices in ASD

Evidence-based practice (EBP) is an approach to health care wherein health professionals use the best evidence possible (i.e., the most appropriate information available) to make clinical decisions for individual patients (McKibbon, 1998). The term evidence-based practice was first introduced and used in the medical field (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996; Goodman, 2003). As medical professionals continued to use the term in practice, additional fields began to adopt the term and practices into their work. In the field of Applied Behavior Analysis (ABA), Slocum et al. (2014), suggests that EBP of ABA is to be understood as a professional decision-making framework that draws on the best available evidence, client values and context, and clinical expertise.

Providing a definition for EBP and establishing criteria for the amount of evidence needed to qualify as an EBP are two necessary initial steps for identifying these practices in the research literature. For a specific practice to meet the criteria for an EBP, the practice must show evidence from (a) at least two experimental or quasi-experimental group design studies carried out by independent researchers, (b) at least five single case design studies from at least three independent investigators, or (c) a combination of at least one experimental and one quasi-experimental study and three single case design studies from independent investigators (Odom et al., 2010). Based on the above-mentioned criteria, Odom et al. identified 24 EBPs for individuals with ASD. These EBPs are categorized into two subgroups, which include behavioral intervention strategies and positive behavioral support strategies, and then by learner outcome, which includes academic skills, behavior, communication, play, social and transitions. The authors also used the criteria to develop systematic guidelines, implementation checklists and web-based modules for practitioners to use when implementing the identified EBPs to ensure treatment efficacy, which continue to be used by practitioners.

In addition to the EBPs identified by Odom et al. (2010), Wong et al. (2015) conducted a similar review of the current literature to identify EBPs for individuals with ASD. Through this extensive review, the authors identified 27 evidenced-based practices, which include ABA techniques, assessment, and combinations of practices used in a routine and systematic way that fit together as a replicable procedure. The above-mentioned 27 EBPs are currently seen as "best practice" for teaching individuals with ASD and can be used as a guideline in selecting the best intervention or strategy to meet a child's individual needs.

Along with Wong et al. (2015), The National Autism Center (NAC) launched the second phase of the National Standards Project (NSP2), in order to provide up-to-date information on

the effectiveness of a broad range of interventions for ASD (NAC, 2015). When selecting interventions, the NAC recommends selecting Established Interventions, which have sufficient evidence of effectiveness. Further, they suggest that the decision-making team give serious consideration to these interventions because (a) they have produced beneficial effects for individuals involved in the research studies published in the scientific literature; (b) access to interventions that work can be expected to produce positive long-term outcomes; and (c) there is no evidence of harmful effects for the interventions. However, the NAC states that it should not be assumed that these interventions would universally produce favorable outcomes for all individuals with ASD. Given the variability of symptoms associated with ASD, and the nature of ASD as a spectrum disorder, individuals with ASD may display different characteristics and therefore require different treatment approaches based on individual needs.

*Comprehensive Treatment Models*

Although there is not one definition of a comprehensive treatment model (CTM), it is often used as a term to describe a set of practices designed to achieve a broader learning or developmental impact on the core deficits of ASD (e.g., National Research Council, 2001). Romanczyk, Gillis, White and Digennaro, (2008) argue that a CTM must address the core areas of ASD, as well as the individual differences and comorbid conditions that may be present. They also emphasize the importance of identifying and categorizing existing treatments for children with ASD as helpful in assisting the decision-making process for parents, clinicians and professionals. Other researchers, such as Rogers and Vismara (2008), describe CTMs as branded interventions that are identifiable by a name.

There has been ongoing research to support the efficacy of the use of CTMs for individuals with ASD across settings. Odom, Collet-Klingenberg, Rogers, and Hatton (2010)

conducted a review of CTMs using a multidimensional evaluation including six features, (a) operationalization, (b) implementation measures, (c) replication, (d) type of empirical evidence, (e) quality of the research methodology, and (f) complementary evidence from studies of focused interventions. The evaluation identified 30 CTMs based on several different conceptual and theoretical frameworks, including ABA. The study provided information on the quality of the procedures and implementation, the number of replications of the model, and the associated evidence generated by efficacy studies of focused interventions that are components of the models. The authors provide a quality rating from 0-5 across each dimension for an overall score. Five of the CTMs were scored as having high evidence (Early Start Denver Model, LEAP, Lovaas Institute, May Institute and PCDI), and others were scored as having only emerging evidence. The authors also identified CTMs with low evidence ratings and listed these programs to assist consumers in their decision-making. Overall, the use of CTMs in classroom and community-based settings is an expanding area for teaching individuals with ASD and there are several CTMs with growing evidence for the efficacy of the model, such as STAR (Arick et al. 2003; Mandell et al. 2013; Bacon et al. 2014), Early Start Denver Model (Dawson et al. 2010), The Competent Learner Model (Tucci et al., 2005) and the TEACCH intervention (Mesibov et al., 2005; University of North Carolina School of Medicine, 2011).

One CTM with emerging research support is the Strategies for Teaching based on Autism Research (STAR) curriculum (Arick, Krug, Loos & Falco, 2004). This CTM is a research-validated curriculum, which includes lesson plans, teaching materials, data systems and a curriculum-based assessment for teaching in the six curricular areas of receptive language, expressive language, spontaneous language, functional routines, academics, and play and social skills. Several studies have been conducted to evaluate the effectiveness of the STAR program

for individuals with ASD (Arick et al., 2004; Mandell et al. 2013; Bacon et al. 2014). Bacon et al. created an adapted Student Learning Profile (aSLP), which consisted of the traditional STAR SLP and additional goals from the Teaching Social Communication to Children with Autism (TSC) curriculum. The authors found that the supplemental use of a curriculum-based assessment, the aSLP, was helpful in determining the benefits of an early intervention program for children with ASD. The children in the study were assessed using multiple standardized assessments and showed variability in progress. The authors argued that the addition of the aSLP was very informative, in terms of ongoing child response to treatment, treatment trajectory, and information about specific behaviors, in comparison with general information about the child's ability level, which was provided by standardized assessments. Bacon and colleagues also concluded that the aSLP may be useful for early goal development as it allows for a systematic, yet individualized process for the child's treatment program to follow.

<div align="center">Effective Teacher Training In ASD</div>

Teacher training in EBPs for individuals with ASD is imperative to the successful implementation of these practices. Scheuermann, Webber, Boutot, and Goodwin (2003) discuss the lack of formal data available about the preparation of ASD support personnel. The authors highlight two main concerns related to teacher certification programs. One concern relates to the prevalence of non-categorical or multi-categorical certification, which leads the authors to question the ability of programs ability to provide instruction in the range of specialized skills needed by teachers of students with ASD. For example, some states including Pennsylvania, offer an autism specific endorsement in addition to a teaching certification, but it is not required to teach students with autism (Pennsylvania Department of Education, 2016). This certification can only be obtained after completing a Masters' degree post-certification. Along with non-

categorical or multi-categorical certification, the authors also highlight the growing teacher shortage and use of non-certified and emergency certified educators placed in special education classrooms due to the shortage. From 2005 to 2012, the number of special education teachers employed by U.S. schools declined by >17% (Dewey, Sindelar, Bettini, Boe, Rosenberg & Leko, 2017). The number of education majors in Pennsylvania colleges and universities has dropped 55% since 1996, and the number of new teaching certificates issued in the state dropped by 71% between 2009-10 and again (70%) in academic year 2016-17 (Graham, 2018). The lack of clear standards and different state standards for certification may lead to the issues related to insufficient pre-service teacher preparation. In addition, many teachers are provided training predominately in one specific skill area (e.g., content specific areas) which may not be the right fit for all students with complex learning needs in their classroom. Scheuermann and colleagues recommend that teacher-training programs provide teachers and others who are involved with teaching students with ASD with a "tool box" full of many best practices as one approach to addressing this ongoing need in special education.

Hadadian and Chiang (2007) conducted a survey of 248 pre-service teachers during their undergraduate and graduate coursework. This study examined the experiences of graduate versus undergraduate students, course work in special education, and contact/experience with people with disabilities. The pre-service teachers who received coursework in special education showed positive results in teachers' feelings towards inclusion. Participants were also asked to identify the top three most important areas they needed to learn more about which included disability categories, teaching methods, laws and regulations, resources, and parenting. When discussing learning more about disability categories, teachers reported with the highest frequency that they wanted to learn more about ASD. However, it was also reported that ASD was identified as a

preferred category of students to teach by only 8.8 percent of undergraduates and 10 percent of graduates (Hadadian & Chiang). These results may suggest that pre-service teachers report an increased need in training on ASD and therefore report a decreased desired to teach this specialized population due to their lack of training in this disability category. Overall, the survey results indicated that preservice teachers would benefit from formal training and curriculum in special education.

Ergul, Baydik and Demir (2013) also surveyed pre-service teachers who were enrolled in a special education department program, and current special education teachers who were graduates of the programs. The survey results indicated that some students who graduated from the undergraduate special education teacher preparation program found themselves incompetent in the areas of teaching reading and writing (28%), speech-language (20%) and students with ASD (11%). A smaller proportion of teachers who completed a special education certification program reported feeling incompetent in teaching reading and writing (8%), ASD (3%) and speech language (0%). When surveying pre-service teachers, participants reported needs in similar areas, indicating that they found themselves incompetent in teaching academic skills (25%), addressing problem behaviors and classroom management (20%), and ASD (15%) (Ergul et al.). The results of this survey show a need for additional training in several areas. Both pre-service and current teachers reported a feeling of inadequate abilities to teach children with ASD, despite their undergraduate training and experience. Graduates of the special education program and pre-service teachers indicated that they needed in-service training on speech language, communication, ASD, classroom management, and instruction of academic skills. The participants also reported a need for in-service training on communication and classroom management strategies, which, arguably, are directly related to students with ASD. The authors'

final recommendation in the study was for an increase in the number of courses related to ASD in special education teacher training and coursework (Ergul et al.).

Although there is sound evidence supporting particular interventions, the field is lacking in adequately training educators in the use of ASD -specific EBPs. In a survey of 185 teachers in Georgia, Morrier, Hess, and Heflin (2011), found that fewer than five percent of the teachers reported using best practices for students with ASD in their classrooms. The authors also found that fewer than 15% of the teachers reported receiving training on strategies for students with ASD in their college teacher preparation programs. The most common form of training was attendance at a workshop (full or half day trainings), with 20.54% of teachers reporting this type of training.

Overall, these studies highlight the need for increased training and support for special education teachers, specifically when working with students with ASD. It is evident that pre-service teachers receive little to no training in best practices for teaching individuals with ASD. This suggests an increased need for specialized training to support teachers either during pre-service training, or in their beginning years of teaching individuals with ASD in order to provide these students with the best educational services given their complex learning needs.

<center>Use of Evidence Based Practices for Students with ASD</center>

Given the research showing a lack of pre-service and teacher training focused on treating individuals with ASD, it is unclear if teachers are implementing EBPs in the classroom. Stahmer, Collings, and Palinkas (2005) interviewed 22 service provides of children with ASD and found that few reported receiving training in EBPs and treatments. The service providers also reported a lack of knowledge of EBPs as well as wanting training related to EBP. The participants listed 30 intervention techniques and 21 specific strategies that were being used in their programs, with

<center>15</center>

The Picture Exchange Communication Systems (PECS) reported as the most commonly used intervention. Of the 30 interventions participants listed, approximately one third (n = 9) were EBPs or had at least some evidence of efficacy for children with ASD, based on the standards reported by the National Research Council (2001). The authors of the study reported that participants tended to endorse any intervention they used as being evidence-based and it appeared that if they attended a workshop on a method, they felt there was sufficient evidence to support the practice. Participants recognized their lack of knowledge in the specific area on the research for the method and none of the participants referred to research literature. The findings of this study may imply that educators and clinicians are making clinical decisions based on other factors, not the research base, to identify interventions and strategies to use for children with ASD. Although service providers state they are using these practices, it is worth nothing that this is based on a self-report interview and EBPs may not be used or not used with fidelity. As a result, one may hypothesize a need for training in such area. Stahmer, Collings and Palinkas (2005) also found that participants reported a need for more training on interventions they should be using with their students, both for themselves and others, who work in early intervention programs. It was a common theme among staff that increased support and training was needed, especially when discussing specific interventions. Participants reported that a good understanding of the original technique (intervention or practice) was needed in order to make the appropriate modifications based on student needs, when working with various children in different environments. The participants stated that paraprofessionals provided an extensive amount of service but did not receive the same level of training as the participants, which suggests that in addition to teacher training, there is a need for paraprofessional staff training as well.

Hess, Morrier, Heflin and Ivey (2008) surveyed 185 teachers of individuals with ASD in Georgia on their use of EBP for students based on Simpson et al.'s (2005) categories (i.e., scientifically-based, promising practice, limited supporting information, or not recommended). Teachers reported on strategies based on one of the following categories: interpersonal relationships, skill-based, cognitive, physiological/ biological/ neurological, and other. Based on the categories, teachers reported that skill-based strategies were the most likely to be used in the public-school setting. Within skill-based strategies, assistive technology was reported as the most frequently used strategy. Interpersonal Relationship strategies were reported as the second most frequent type of intervention strategy used with 22.05% of teachers' reporting using this strategy, and Gentle Teaching, a type of interpersonal relationship-based strategy, was most frequently used (49.15%). Overall, the authors found that only 28.6% of Georgia educators used any strategy rated as evidence-based or as a promising practice for children with ASD. Of those educators, 7.70% of the respondents reported the use of scientifically based strategies; 20.90%, the use of promising practices; 27.90%, the use of strategies with limited support and 4.70%, the use of strategies that are not recommended. 33.5% reported strategies that were not rated by Simpson and colleagues. Of the strategies listed that were not rated by Simpson and colleagues, participants reported using visual schedules, the verbal behavior approach, Assessments of Basic Language and Learning Skills (Partington, 2010), Integrated Movement Therapy (Kenny, 2002), Rapid Prompting Method (Tostanoski, Lang, Carnett & Davis, 2014), Self-Injurious Behavior Inhibiting System (Fischell, Fountain, & Blackburn,1984) and Lindamood-Bell and Bolles Sensory Learning. Fewer than 10% of the strategies that teachers reported using met the criteria in Simpsons' report, with the top five most frequently used strategies lacking research evidence

17

or support (Hess et al.). The results of this study indicate frequent use of non-evidence-based strategies for individuals with ASD.

Overall, the results of these survey-based studies reflect the need for increased support for teachers and staff in the use of EBPs. Based on the study findings, teachers' self-reports show they are lacking knowledge and education related to EBPs. Teachers' are also reporting difficulties related to implementing EBPs for their students, which in turn likely effects student outcomes for individuals with ASD. Although teachers and staff may be provided with some information or initial training, there is limited evidence to suggest that teachers commonly use EBPs in classroom and community-based settings.

Approaches to Increase Teacher's EBP Implementation

*Teacher Training*

Teacher training can be an effective approach to increase knowledge of ASD and best practice. Leblanc, Richardson, and Burns (2009) conducted a study on 105 pre-service educators enrolled in the bachelors of education degree program. There were three experimental groups defined by one of three bachelors of education program sections, with 35 students per program section. The authors developed a training and measures to enhance the knowledge with respect to the characteristics of students with ASD and the skills and knowledge related to the principles of ABA and other strategies. The authors aimed to increase pre-service teacher's perceptions and attitudes related to individuals with ASD and their technical knowledge of ASD. The training consisted of 200 minutes of instructional training by an ASD consultant, conducted one week apart. The authors found that the training sessions were effective in changing participant's attitudes and perceptions about students with ASD, with increased knowledge of how to access professional support and resources to assist a participant in meeting the needs of a student with

an ASD. The study also found a significant difference in the technical knowledge, but it is important to note that the overall post-test score for technical knowledge was low for all groups in the study.

Along with the work by Leblanc and colleagues, Grey, Honan, McClean, and Daly (2005) implemented a teacher training protocol with 90 hours of classroom instruction and supervision, using a single case A-B design. The protocol consisted 45 hours of training in the basic principles of ABA and 45 hours addressing how to apply these principles in practical settings. After completing the training, teachers reported a high quality of the training program. They also reported that the training they received would affect their professional practice and that it would affect their future students in a positive way. Overall, they felt their knowledge of ABA had expanded, but they were unsure if the number of supervision hours they received was enough to meet students' needs. Based on the teachers' survey responses, one could hypothesize that teachers valued the training they received, but felt the need for an increased amount of training and supervision beyond what was provided in the study.

Given the research supporting teacher training as an effective approach to increasing teacher knowledge of ASD and interventions, Scheuermann, Webber, Boutot and Goodwin (2003) argue that effective teacher training requires ongoing technical assistance and access to resources, including conferences, state and federal documents, training manuals and videos, access to information and directories for technical assistance. The technical assistance can be provided through training sessions, on-site or video consultation and coaching, video-conferencing, e-mail or phone conversations, and the provision of appropriate resources. When providing consultation or coaching, the authors suggest that it is best provided by trainers or mentors who were trained specifically to provide such services. Along with consultation or

coaching, the authors suggest a method of self-monitoring or allowing the self-monitoring form to be completed by an on-site consultant for the purpose of identifying areas that need improvement and those that the teacher has mastered. This approach could allow for collaboration between the coach and teacher to target specific areas of need in ASD specific training.

Stahmer et al. (2015) conducted a study to examine the extent to which public school teachers implemented evidence-based interventions for students with autism in the way these practices were designed, that is, with high treatment fidelity. The participants were autism support classroom teachers who were receiving consultation and training in the STAR curriculum. The authors examined the use of several EBPs, including Discrete Trial Training (DTT), Pivotal Response Training (PRT;Koegel, Koegel, Harrower, & Carter, 1999) and Functional Routines, in 57 classrooms. Overall, the authors found that the complexity and structure of the intervention strategy may affect intervention use and procedural fidelity. The authors concluded that teachers were more likely to use structured strategies, such as DTT, with higher fidelity than less structured strategies, such as PRT. For structured strategies, higher procedural fidelity continued to increase through the second year of training. Their findings suggest the importance of continued practice for extended periods, due to the decrease in implementation fidelity over time. Overall, the authors argue that teachers and staff in special education classrooms can learn to implement structured strategies. Although the teachers and staff were able to learn the skills, they required training, coaching and time to reach and continue to maintain fidelity of the intervention implementation.

Overall, there is a growing research base, which supports the ongoing need for training and support in specific EBPs and interventions for individuals with ASD, especially in

classroom, and community- based settings. One approach to teacher training is the use of

research-based consultation approaches. There are several different consultation approaches,

which may be effective in teacher training of EBPs for individuals with ASD.

*Consultation Approaches*

     *Performance feedback.* Several studies have used a performance feedback approach with

teachers to increase treatment integrity in classroom-based settings. Noell, Witt, Gilbertson,

Ranier, and Freeland (1997), conducted a study comparing consultation only versus performance

feedback on teachers' treatment fidelity in elementary classrooms. Teachers received

consultation only and the performance feedback procedure was implemented when treatment

integrity was low and stable or trending downward. Once the performance feedback model was

introduced, the consultant presented the teacher's treatment fidelity data, identified the specific

treatment steps the teacher had missed the preceding day, and discussed the importance of those

steps. The consultant also discussed with the teacher how to improve implementation and

provided praise for treatment steps that were accurately completed. The performance feedback

meeting ended with the consultant scheduling the feedback appointment. The authors found that

consultation only did not improve teacher's treatment fidelity; however, when performance

feedback was introduced, all teachers demonstrated increased treatment integrity.

     Mortenson and Witt (1998) conducted a similar study using a multiple baseline design to

measure the effect of teacher performance feedback on treatment implementation. The authors of

this study provided teachers with initial training and consultation by outlining and systematically

teaching treatment steps to the teacher both in and outside of the classroom. After training was

complete, teachers were asked to implement the treatment without assistance from the

consultant. Then, a performance feedback phase was initiated when treatment integrity scores

were stable or decelerating and indicative of treatment implementation below 70%. During the performance feedback phase, the consultant conducted weekly performance feedback meetings with the teacher at the beginning of the day. Each feedback meeting consisted of (a) presenting the teacher with the data on intervention usage and student academic performance; (b) providing positive feedback for completed intervention steps; ( c) providing corrective feedback by reviewing each intervention step omitted or implemented incorrectly; (d) addressing any questions or comments; (e) obtaining a verbal commitment from the teacher to perform the intervention correctly; (f) prompting the teacher to continue faxing the daily summaries; and (g) prompting that the consultant would return in one week. The meetings were typically five to seven minutes in duration. The results showed that three of four teachers in this study exhibited decreased intervention implementation during the time of no assistance from the consultant. The authors found that performance feedback resulted in immediate increases in overall teacher treatment integrity for each teacher who received performance feedback.

Teachers receiving consultation often have low rates of treatment implementation and fidelity. Noell et al. (2000) conducted a study targeting treatment implementation for general education teachers using a performance feedback model. Teachers in the study received in-class training including a discussion with the consultant, materials to implement the intervention and verbally committed to implementing the intervention. During baseline, one teacher implemented a mean of 10% of the treatment steps, with three teachers partially implementing the intervention initially, but ended implementation with several days of no implementation and one teacher implementing a higher rate at baseline. When treatment integrity data were low and stable or trending downward, follow-up meetings were held. Most meetings were five minutes in duration and consisted of the consultant asking about the intervention, with the teacher reporting no

concerns or questions. Three of the teachers did not implement the intervention when follow-up meetings were provided, which prompted additional support. For the performance feedback phase, the consultant met with the teacher each morning before school for 3 to 5 min to present student data and teacher implementation data. The consultant also identified the specific treatment steps the teacher had missed or completed incorrectly and discussed with the teacher how to improve implementation. Overall, the authors found that all teachers implemented the intervention above baseline levels in one or more follow-up phases. They reported that performance feedback was successful for three teachers, and one teacher required an additional reminder that there was an upcoming meeting with the principal, to improve her implementation, suggesting that accountability to administrators was key facilitator for treatment fidelity. One particularly important finding was the consultant exercised no formal administrative authority and the teachers were free to accept or reject the consultants' recommendations, yet consultation still improved their performance.

Noell et al. (2005) conducted a trial comparing several consultation approaches. The performance feedback (PFB) procedure used in this study was modeled after the previous research, referenced above, as an approach to increase treatment plan implementation (Mortenson & Witt, 1998; Noell et al., 2000). The PFB consisted of meeting briefly with the teacher, reviewing the intervention permanent products, graphing student behavior, and graphing intervention implementation. The consultant provided positive feedback regarding steps that were completed and identified steps that were omitted or implemented incorrectly and the consultant and teacher then discussed the importance of any missed steps, problem solved for future implementation, and scheduled their next contact. The PFB model was implemented using

a rapid thinning to a once per week follow-up. Overall, the results of this study showed positive outcomes for treatment fidelity and student outcomes.

*Commitment emphasis*. The commitment emphasis model of consultation is based on the social influence literature. O'Keefe and Medway (1997) explored principles concerning the construction of effective persuasive messages in consultation. The authors provide insight to the resistant behavior and attitudes toward goals for performance improvement. O'Keefe and Medway argue that although teachers may have an appropriate attitude, their performance does not improve due to other barriers including normative pressures or perceived inability to perform a behavior. They suggest consultants should focus attention on the appropriate persuasive targets if they are to be successful in behavior change, and state that effective persuasion requires a sympathetic and accurate understanding of the consultee's circumstance. O'Keefe and Medway also discuss the importance of message clarity and specify of the consultant. Often, the consultant tends to be indirect when encountering resistance and may be reluctant to deliver messages that may elicit a negative reaction. O'Keefe and Medway argue that messages with explicit conclusions and recommendations have been found to be more persuasive and that there is consistent evidence concerning consultation specifically, which indicates the greater persuasive effectiveness of messages containing clear, direct, and specific recommendations and conclusions. The authors also discuss the importance of using examples. O'Keefe and Medway argue that when trying to influence consultees' normative perceptions, it may be more useful to mention specific people or instances. They argue for use of examples of specific people, rather than quantitative information about norms, because of the generally greater impact of examples over statistics. When implementing persuasion techniques, O'Keefe and Medway also highlight the importance of following up with consultees, given that most effects tend to decrease over

time. O'Keefe and Medway suggest that the only follow-up that may be needed is a simple prompt from the consultant, which can influence the behavior of the consultee to engage in the desired behavior.

Noell et al. (2005) also explored the efficacy of a commitment emphasis (CE) model. The study compared the use of a weekly check-in, performance feedback and commitment emphasis model of consultation to increase teacher fidelity. The commitment emphasis consultation approach focused on the teacher's commitment to behavior change and importance of implementing the interventions, as well as discussing the steps to complete the action items. Through the commitment emphasis approach, teachers received all elements of weekly follow-up as well as a social influence procedure. The social influence procedure consisted of reviewing specific points with the teachers that were designed to enhance the correspondence between their commitment to implement the intervention and actual implementation. The points included the consultant describing how people frequently make commitments to behavior change but fail to follow through with that plan due to other time demands, and the importance of the intervention plan as a commitment to the student. The consultant and teacher also discussed proactive steps the teacher could choose to complete the task. Overall, the results of the study showed positive outcomes when using a CE approach when compared to a weekly check-in model, but the authors suggest further research is needed in this area to extend their findings.

*Prompts.* Several studies have also shown the effectiveness of using prompts as a strategy to increase teacher implementation. Collier-Meek, Fallon, and DeFouw (2017), explored the use of e-mail prompts to increase treatment integrity, rates of student praise and intervention implementation. Teachers received didactic training for the behavioral intervention by a consultant who also completed classroom observations. After the didactic training, e-mail

prompts were sent to teachers including steps of the intervention, tips for implementing each step, a sample dialogue, and a quick tip with suggestions. The results of the study showed that all teachers had low levels of treatment integrity following didactic training, but three of the four teachers showed increased treatment integrity after e-mail prompts, with both adherence and quality showing improvement.

Recent research has also explored the use of prompts along with a performance feedback model to increase teacher treatment integrity (Fallon, Meek, Kurtz & DeFouw, 2018). The teachers in this study were provided a with one-to-one, 15 minute didactic training reviewing the student baseline behavioral data along with a general introduction of the intervention. After the didactic training, the teachers received an e-mail with a support strategy that also reminded teachers of the steps of the intervention and a quick tip. Teachers were also provided support through emailed performance feedback. This e-mail included the intervention steps along with a graph of implementation during the previous observation, praise for the intervention steps implemented as planned, and a reminder to complete the non-implemented steps.  The results of this study are consistent with previous findings by Collier-Meek et al. (2017) in that teachers showed low treatment integrity post didactic training and an increase in treatment integrity with prompts. The authors found that treatment integrity was highest when email prompts were paired with the performance feedback. Although teachers showed increases based on the prompts, the social validity of the didactic meetings (brief one-time meetings) were rated slightly higher than the ongoing emailed support. Teachers also rated prompts as preferable compared to performance feedback. They hypothesize this finding is due to teachers preferring a proactive strategy rather than reactive.

Overall, the above studies outline the effectiveness of a performance feedback and commitment emphasis model in increasing teacher intervention implantation and fidelity, as well as the use of prompts. When compared to a "check-in" or meeting model, performance feedback and commitment emphasis are more effective in increasing the likelihood of teachers' implementation of a treatment or intervention. In most cases, performance feedback was successful, though with one teacher, the reminder and perceived pressure of meeting with her principal had a stronger effect than the data presented by the consultant in the performance feedback model, which one can argue is an important consideration when discussing teacher behavior change.

Performance feedback is the most widely used consultation approach, but others such as commitment emphasis and prompts show promise. There is limited research on the use of a commitment emphasis model in classroom based consultation. The research by Noell et al. (2005) was based on a small number of teachers in a single subject design study, and showed varying results of efficacy. The use of prompts for teacher behavior change also has limited research, though the use of prompts for students is widely used and considered an effective EBP (Wong etl a. 2014). Many of the current studies include a small number of teachers, with limited research to support the use of different consultation approaches in a larger sample of teachers. There is some growing research to support consultation approaches to increase teacher implementation of EBP in classroom-based settings, but the research is limited in the use of consultation for the completion of student assessment, specifically in autism support classrooms. This study will aim to address these areas, including the use of commitment emphasis and prompts to influence teacher behavior in the use of autism-specific assessments in a classroom-based setting.

CHAPTER 3

METHODS

Participants

*Teachers*

The participants consist of 29 kindergarten through fifth grade autism support teachers in the School District of Philadelphia. Teachers enrolled in this study were actively receiving support from Philadelphia Autism Instructional Methods and Support (PhillyAIMS) through the district. All teachers were considered first-year autism support classroom teachers for this consultation. New autism support teachers are considered new to the school district. Some teachers may have taught autism support in other school districts or settings. The mean participant age was 35 years, with an overall range of 23-61 years of age. The participants represent a diverse sample and consist of the following ethnic distribution: 26% African-American, 71% Caucasian, and 3% other ethnicities, with none of the participants identifying as Hispanic/Latino. Additionally, 93% are female and 53% of the participants report having a master's level degree. The mean number of years teaching is 7.81, number of years as a special education teacher is 6.32 and the number of years as a teacher of students with ASD (in other school districts) is 2.35. Participants report diverse experiences, with 70% of teachers having some experience working with children with ASD in other professional capacities.

*Coaches*

The coaches for the study consisted of three Masters-level clinicians who identified as White females, with experience working with individuals with ASD. One coach was a Board Certified Behavior Analyst. Two were former autism support classroom teachers. Each coach has

specialized training and experience working with individuals with ASD. Coaches have two or more years' experience working in their current position as a coach.

<center>Setting</center>

All participants are teachers currently employed by the School District of Philadelphia. The School District of Philadelphia is a diverse district serving over 133,000 students and 19,402 (14.5%) students are receiving special education services with 14.3% of those students classified with an Autism Spectrum Disorder (Pennsylvania Department of Education, 2018). The city of Philadelphia has a median household income of $39,770, with 25% of residents living in poverty (U.S. Census Bureau QuickFacts: Philadelphia County, Pennsylvania; Pennsylvania, 2017). The school district is in an urban environment, where an average of 94% of students are considered economically disadvantaged. The student population represent a diverse sample and consist of the following ethnic distribution: American Indian/Alaska Native 0.3%, Asian 8.1%, Black 51.1% Hispanic 19.3%, Native Hawaiian/Other Pacific Islander 0.1%, Two or More Races 7.5% and White 13.7% (Civil Rights Data Collection- Philadelphia City SD, 2015). The study took place in 28 public schools, with most teachers working throughout different schools in the district. The classrooms support students in grades kindergarten through second and third through fifth grade autism support classrooms. The schools are enrolled based on their identification of a new autism support teacher.

<center>Measures</center>

The outcome of interest used for this study was the completion of Student Learning Profile (SLP). The SLP is a multi-level assessment. Teachers can select a level one, two, or three assessment based on their student abilities. Each level addresses different skill areas including receptive language, expressive language, spontaneous language, functional routines, pre-

academic skills and play/ social skills. The Level 1 kit focuses on addressing students who have difficulty understanding or following simple commands, have no language or very little language, have moderate behavior issues when asked to follow a simple task, and/or may not interact with other children very well. A Level 2 kit would be selected for a student who can often follow some simple commands but conversely shows difficulty with 2-step commands or requests that are considered more complex, uses only one word (or picture) to request desires, understands only simple nouns, plays only in isolation, and only follows simple routines. A Level 3 assessment would be selected for a student who can use two or more words (or pictures) to communicate and is able to label objects, identify numbers and letters, identify a few words by sight-reading, and follow most classroom routines with verbal directions or picture schedule (Arick, Krug, Loos, & Falco, 2004).

Measures are described as follows, as they relate to each research question. Two types of outcomes were collected, assessment completion and time to completion. Time one data were collected at the teacher's third consultation visit (September- October). Each coach collected a count of the number of SLPs completed per teacher by student. SLPs were only included in the count if the entire assessment was complete. Data were then collected at mid-year (January). Coaches again recorded the number of completed student SLPs for each teacher. Time to completion was calculated and compared for teachers in each group. Baseline data were collected for all teachers at time one (September-October), or the third consultation visit. During subsequent visits, coaches also recorded any completed SLPs. Data was then collected again for all teachers at mid-year (January), or the sixth consultation visit. Time to completion was based on the time (number of visits) to completion of the SLP assessment per student by teacher.

*Intervention Fidelity*

A procedural fidelity checklist was used to assess the accuracy of implementation of the protocol for all sessions of both the treatment and control groups. The raters marked yes if a step on the checklist was implemented accurately or no, if it was not completed. The percentage of procedural fidelity compliance was calculated by dividing the number of steps that were marked yes by the total number of steps (Table 2). The fidelity checklist was completed by the coach for each session and reviewed by the first author to ensure fidelity (see Appendix A).

Procedures

All teachers in the study were assigned a coach through PhillyAIMS. Coach visits occur throughout the year. Each teacher receives thirteen, 1.5-hour visits over the course of the school year. Traditional consultation consists of several areas including physical classroom set-up, center-based routines, visual schedules and routines, team organization, assessment (SLPs), pairing, communication training, and positive reinforcement. The consultation focuses on these core areas through the use of a performance feedback model. Based on the area selected, the coach provides targeted consultation in the selected area. Each area is scored when selected during a consultation visit and considered mastered at 80% completion. When completing the SLP assessment the goal is completion rather than fidelity. Completion is defined as answering all questions in the SLP assessment. Questions in the assessment can be answered through direct teacher observation or direct student skill assessment. Teachers are not scored on the fidelity of the recorded response. All teachers receive in-vivo coaching on how to complete the SLP assessment throughout their consultation. Teachers received three visits before time one data collection.

Teachers also received didactic training in the beginning of the school year. This training consisted of one full day professional training conducted by the lead author. The training focused on the school district autism support programming. This also included didactic training on STAR and the SLP assessment. All teachers were invited to attend this training in August, prior to the beginning of the school year. Teachers also have access to the PhillyAIMS website, which includes resources specific to STAR and the SLP including webinars and instructions to access independent of their consultation visits.

<center>*Randomization*</center>

Participants were randomly assigned to one of two groups using a between group design. Teacher randomization was within coach and coaches were assigned teachers in both groups. The study consisted of two groups, a control group which included teachers being coached using a performance feedback approach and given initial prompts to complete the SLPs and an experimental group where teachers were coached using a performance feedback model plus commitment emphasis and given prompts throughout their consultation to complete the SLPs.

The control group received the standard consultation agreement which outlined the general expectations of the teacher throughout the year. Teachers in this group were told SLPs are a great tool to use for baseline assessments for their students and the coach hopes they are able to complete the SLPs. The coach followed the standard procedures of the consultation agreement and schedule. The experimental group received the standard consultation agreement, which outlines the general expectations of the teacher throughout the year with an additional requirement listed stating, the completion of Student Learning Profiles at the beginning, middle and end of the year. Teachers in the experimental group also received prompts which included

<center>32</center>

statements related to principal expectations of completion, referring to the district protocols and selection of curriculum and reminders to complete the SLP by their next scheduled visits.

*Control Group*

The control group followed the standard consultation approach, performance feedback. During the initial visit with the teacher, the coach reviewed the data collection time points in pre-established contract. The time points include beginning (September-October), middle (January) and end (May) of year. During these time points, teachers are expected to complete SLPs for each student in their class. This data collection is outlined in the consultation agreement, which is signed, by both the coach and teacher. Each coach then followed a script, which prompted the coach to state:

1. The SLP completion rate will be included in 60-day report to be sent to your Principal.

2. The SLPs are a great tool to use for baseline assessments for your students and part of the district-selected curriculum you are encouraged to use.

During subsequent visits, the coaches were instructed to follow the implementation checklist and typical consultation schedule based on teacher's needs and pre-established consultation approach as per the school district contract. The implementation checklist is designed based on a performance feedback approach. Teachers are scored on pre-selected target areas and provided with feedback during the consultation visit. Coaches did not provide a prompt to teachers to complete the SLPs outside of the implementation checklist progress. If assessment (SLP) was selected as a target area of the implementation checklist, the coach then continued with in-vivo coaching on this area using the performance feedback only method. After the third

consultation visit, the coach collected a count of the number of SLPs completed per teacher based on the number of students in the class.

*Experimental Group*

The experimental group received consultation using a performance feedback plus commitment emphasis model of consultation. As with the control group, the coach used the same implementation checklist and performance feedback; however, the commitment emphasis model intervention was added, which is comprised of delivery or prompts and social commitment. During the initial teacher visit, the coach reviewed the data collection time points outlined in pre-established contract and was signed by both the coach and teacher. These time points include beginning (September-October), middle (January) and end (May) of year. During these time points, teachers are expected to complete SLPs for each student in their class. For the initial visit, the coaches followed a script that prompts the coach to state:

1. The SLP completion rate will be included in 60-day report to be sent to your Principal.
2. The SLPs are a great tool to use for baseline assessments for your students and part of the district-selected curriculum you are encouraged to use.

During subsequent visits, the coaches will use a script with the following prompts to remind teachers that:

1. SLP completion is part of the contract they signed in the beginning of the school year.
2. SLP assessments are part of the district-selected curriculum.
3. Other Autism Support teachers in the district use this assessment.
4. SLP completion rate will be included in the 60-day report sent to their Principal.

5. The coach will count how many SLPs are complete at their third consultation visit.

Coaches also followed the implementation checklist and typical consultation schedule based on teacher's needs and pre-established consultation approach as per the school district contract. The implementation checklist is deigned based on a performance feedback approach. Coaches reminded teachers to complete the SLPs in accordance with the implementation checklist. The assessment (SLP) section was selected as a target area of the implementation checklist and the coach continued with in-vivo coaching on this area using the performance feedback plus commitment emphasis approach. After the third consultation visit, the coach collected a count of the number of SLPs completed per teacher based on the number of students in the class.

It is important to note that the key differences between the control and experimental groups are the social influence prompts provided by the coach. The following prompts were only provided to teachers in the experimental group (1) SLP completion is part of the contract they signed in the beginning of the school year. Coaches would refer back to the signed contract when necessary (2) Coaches reminded teachers that the SLP assessments are part of the district-selected curriculum (3) Coaches would tell the teachers that other Autism Support teachers in the district use this assessment and provide examples (4) teachers were reminded that the SLP completion rate would be included in the 60-day report sent to their Principal and (5) teachers were reminded at each visit that the coach would count how many SLPs were completed at their third consultation visit.

Visits for all teachers continued based on the consultation agreement (once every three weeks). During subsequent visits, coaches recorded any additional SLPs that were completed at the visit. After time one data collection, the coaches recorded the percent of completed SLPs on

35

the 60-day report which was presented to the Principal and/or special education liaison. The 60-day report consists of teacher reported data such as number of students in the class, number of staff, number of students with communication skills, number of students being included and general recommendations for the consultation year. Coaches also collected SLP completion data at mid-year (January). All coaches also completed a self-report fidelity checklist after each visit (Appendix A).

## Data analysis

The primary goal of the present study was to analyze the effects of a commitment emphasis and prompt consultation model when compared to a performance feedback model on teacher completion of assessment. Prior to conducting the analyses, preliminary analysis were completed to test if teachers in each condition differed by the number of students they taught, years of teaching experience, and years teaching special education. A multilevel logistic regression with robust variance estimates (RVE) was used to address SLP completion at each time point. A multilevel logistic regression was used due to the nesting of students within teachers, treatment at the teacher level, and because the dependent variable, SLP completion, was a binary outcome. RVE was used to adjust standard errors due to the small sample size of the study. The need for control variables was based on the tests that teachers did not differ between conditions. A multilevel Poisson regression was used to compare the time to SLP completion between groups for teachers who completed the SLP (RQ2). This analysis was used due to the outcome consisting of a count variable.

CHAPTER 4

RESULTS

Before conducting the analyses to address each research question, independent sample *t*-tests were conducted to determine if teachers in the control and treatment conditions differed on years of experience (total, in special education, and with students with ASD) and the number of students they taught in their classroom. Teacher characteristics by intervention condition are presented below (Table 1). Teachers in the treatment and control group did not differ on years of teaching experience ($t(27)=0.52$, $p=.61$), years teaching special education ($t(27)=0.58$, $p=.57$), years teaching students with ASD ($t(27)=-0.77$, $p=.45$), or the number of students in their classes ($t(27)=-0.28$, $p=.71$). Because these variables were not different across groups, they were not included as controls in the models to answer the research questions. Table 2 shows education level, race/ethnicity, age, number of experimental group teachers, and number of control group teachers for each coach in the study. It also shows the fidelity score for each coach in the study. This score represents the fidelity percentage of each coach in both treatment and control groups.

A chi-square analysis was conducted to determine whether coach, apart from exposure to treatment, had any effect on teachers' completion of the SLP or time to complete the SLP. The analysis found SLP completion did not vary coach ($\chi^2(4)=6.0$, $p=.20$) and the time to completion did not vary coach ($\chi^2(4)=6.0$, $p=.20$). Since no difference was found between coaches, coach was not controlled for as a variable in the final analysis.

Table 1.

*Teacher Characteristics*

| Variable | Control (n=15) | Experimental (n=14) | Total (n =29) | $t$ | $p$ value |
|---|---|---|---|---|---|
| Years of teaching experience | 8.53 | 8.07 | *7.81* | 0.52 | 0.61 |
| Years teaching special education | 7.3 | 4.78 | 6.32 | 0.58 | 0.57 |
| Years teaching students with ASD | 1.13 | 2.14 | 2.35 | 0.77 | 0.45 |
| Number of students in class | 7.4 | 7.5 | 7.4 | 0.28 | 0.71 |

*\*Data presented as means.*

Table 2.

*Coach Characteristics*

| Coach | Education Level | Race/Ethnicity | Age | Experimental teachers | Control teachers | Fidelity Score |
|---|---|---|---|---|---|---|
| Coach 1 | Masters' | Hispanic | 28 | 4 | 6 | 97 |
| Coach 2 | Masters'/ BCBA | White | 35 | 4 | 5 | 95 |
| Coach 3 | Masters'/ | White | 33 | 6 | 4 | 100 |

**Question 1:** Does the presentation of SLP completion expectations used in the performance feedback plus commitment emphasis and prompt model increase the likelihood of teachers completing SLPs compared to teachers receiving performance feedback only?

Following randomization and implementation of the commitment emphasis and prompt model with the treatment group and the performance feedback model with the control group, teacher completion of the SLP was measured in October (first time point) and then again in January (second time point). At the first time point, a multilevel logistic regression with robust

variance estimates (RVE) was conducted and found students with teachers in the treatment group showed a statistically significant increase in their implementation of the SLP compared to the control group. Students of teachers in the treatment group had, on average, 25.8 times the odds of SLP completion than students in the control group (*logit*=3.25; *p*<.05). At the second time point, the difference between treatment and control was not statistically significant, but it was substantively large. Students with teachers in the treatment group had an average change in SLP completion of 3.44 logits (*p*=.21), or a 31 times change in the odds of completion in the control group. Collectively, these findings indicate that the commitment emphasis plus prompts initially increased teachers' implementation of the SLP compared to consultation and performance feedback, but this effect diminished at second time point.

Table 3.

*Results from multilevel logistic regression with robust variance estimates for teacher SLP completion at time one*

| Variable | *Logits* | Odds Ratio | Standard error | z | *p* value | 95% confidence interval for odds ratio |
|---|---|---|---|---|---|---|
| Experimental Group | 3.25 | 25.8 | 42.6 | 1.97 | 0.049 | 1.02-654.82 |
| Intercept | 0.046 | 2.33 | 2.4 | 0.83 | 0.405 | 0.32-17.05 |

Table 4.

*Results from multilevel logistic regression with robust variance estimates for teacher SLP completion at time two*

| Variable | *Logits* | Odds Ratio | Standard error | z | *p* value | 95% confidence interval for odds ratio |
|---|---|---|---|---|---|---|
| Experimental Group | 3.44 | 31.11 | 84.91 | 1.26 | 0.208 | 0.148-6543.39 |
| Intercept | | 26.23 | 90.11 | 0.95 | 0.342 | 0.31-22016.05 |

**Question 2**: 1. Do teachers assigned to the SLP performance feedback plus commitment emphasis and prompt model complete the SLP in fewer consultation visits than teachers assigned to performance feedback only?

In addition to measuring whether or not teachers implemented the SLP at the first and second time points, the time to SLP completion (number of visits) was also measured. This was measured at time point two (January). A multilevel Poisson regression was used to compare the time to SLP completion between groups for teachers who completed the SLP (RQ2) and found that teachers in the treatment group did not, on average, take longer to complete their students' SLPs compared to teachers in the control group ($p=.28$). This difference was not statistically significant, but was substantively significant. Teachers in the treatment group took 0.84 times the amount of time to complete their students' SLPs than teachers in the control group; that is, teachers in the control group took 1.2 times as long to complete their students' SLPs than teachers in the treatment group. Collectively, this finding indicates that teachers who completed SLPs completed them around the same time point of year, with teachers in the experimental group completing their assessments somewhat sooner than the control group.

Table 5.

*Results from multilevel Poisson regression for teacher SLP completion over time*

| Variable | IRR | Standard error | z | *p* value | 95% confidence interval |
|---|---|---|---|---|---|
| Experimental Group | 0.84 | .14 | -1.08 | 0.28 | .602 |
| Control Group | 4.22 | .63 | 9.62 | 0.000 | 3.14 |

CHAPTER 5

DISCUSSION

Several consultation approaches have been proposed as effective techniques for achieving teacher behavior change. The most commonly used and most frequently researched approach is a performance feedback model, with emerging research being conducted on the use of a commitment emphasis approach (use of social influence) in behavioral consultation. This study examined the use of both consultation approaches in autism support classrooms and the associations among teachers' completion of student assessment and time to completion of student assessment.

Assessment Completion

In relation to research question 1, "Does the presentation of SLP completion expectations used in the performance feedback plus commitment emphasis and prompt model increase the likelihood of teachers completing SLPs compared to teachers receiving performance feedback only?" the results indicate that the performance feedback plus commitment emphasis and prompt model had a significant effect on increasing teachers' completion of the SLP at time point one (October). This is in contrast to Noell and colleagues' (2005) report of three consultation models, finding performance feedback as the most effective model for teacher fidelity of implementation. However, they also reported commitment as an effective consultation model when compared to a weekly check-in model and suggested further research to be conducted to support this approach.

It was hypothesized that teachers in the experimental group would have higher rates of SLP completion than teachers in the control group. Based on the social influence literature, one can predict teachers' engage in desired behaviors assigned by consultants when the consultant focuses attention on the appropriate targets (O'Keefe & Medway, 1997). In the current study,

41

coaches were focused on the completion of the SLP as a target area for teachers in the experimental group. This is consistent with the recommendations of Noell et al. (2005), which suggests the importance of focusing on teachers implementing the interventions, as well as discussing the steps to complete the action items. The coaches discussed the importance of the assessment with teachers on each visit and reviewed the steps to complete the assessment. O'Keefe and Medway (1997) also suggest that consultants use clear and specific messages, with explicit conclusions in order to have an effect on behavior change. Teachers in the experimental group were provided with a clear message at each visit, which included a direct prompt, with the expectation of completing the SLP. This differs from the performance feedback model, which may be indirect in the expected outcomes that are required, given the ongoing growth being measured. It is possible that the commitment emphasis approach of giving teachers a clear message and expectation of completing the assessment contributed to the higher rates of SLP completion in the experimental group.

It is also possible that teachers in the experimental group had higher rates of SLP completion due to the normative pressure of expectations based on the coach, principal and other teachers. This is also consistent with the recommendations of O'Keefe and Medway, who argue the importance of using examples, including the use of specific people or instances. In the current study, the coaches in the treatment group referred to other autism support teachers who completed the SLP assessment and stated the importance of the SLP due to district selecting this as their autism support programming assessment. The coaches also emphasized the completion of the SLP as an expectation of consultants as well as their principals, given it would be reported to them in their 60-day performance report.

Based on results of the current study, it is possible that the follow-up with teachers also increased their likelihood to complete the assessments. Teachers in the experimental group were reminded during each visit to complete the SLP assessment. Given the increased demands and barriers teachers face on a daily basis, it can be argued that using a prompt or reminder would increase teachers' likelihood of completing an identified task. The use of prompts is also consistent with the suggestions of O'Keefe and Medway (1997), who argue that following up, using a simple prompt, can influence behavior change. Prompts were delivered to teachers in the experimental group during each visit until the teacher completed the assessments. This is consistent with recent research suggesting the use of prompts for teachers shows promising effects on teacher implementation fidelity (Collier-Meek, Fallon, & DeFouw, 2017; Fallon, Meek, Kurtz & DeFouw, 2018).

## Time to Assessment Completion

In relation to research question 2, "1. Do teachers assigned to the SLP performance feedback plus commitment emphasis and prompt model complete the SLP in fewer consultation visits than teachers assigned to performance feedback only?" the results indicate that teachers in the control group did not take longer than the experimental group to complete their SLP assessment. In other words, the SLP performance feedback plus commitment emphasis and prompt model did not have a statistically significant effect on decreasing teachers' time to implement the SLP. Although the difference was not statistically significant, it was substantively significant. Teachers in the control group were completing their assessments 1.2 times later than teachers in the experimental group. It is important to note that these data were only collected for teachers who completed the SLP assessment. Based on the findings of the first research question, it is evident that teachers in the control group were completing fewer assessments, and the data

based on the second research question suggests they were completing them later than the experimental group.

Although there is limited research to support the optimal time of assessment completion, available research shows the importance of timely assessment in relation to student goal creation and student achievement (Fuchs, Fuchs & Deno, 1985). The authors of this study examined how student achievement relates to the ambitiousness of goals and of goal mastery, indicating that the ambitiousness with which goals are established is associated positively with student achievement. In order to create goals that are aligned to student needs and outcomes, it is imperative for student assessment to drive decisions about student goals. Creating goals with appropriate assessment and outcomes can, in turn, increase student achievement. Specifically in the current study, the use of the SLP assessment is an integral part of implementing the STAR program. It is essential for teachers to complete the SLP assessment in order to appropriate program for students and therefore implement the intervention and other strategies. The use of assessment is key for teachers to when planning for student goal creation and programming, therefore consultation should support the use of assessment completion early in the school year.

## Practical Considerations

Previous research shows the importance of implementing EBPs for students with ASD and one approach is the use of CTMs (Odom et al., 2013; Wong et al. 2015), therefore it is also important for teachers to receive training on the implementation of EBPs that are incorporated into CTMs. Although the use of professional development is often used in school-based settings, research has shown that teachers struggle with the daily implementation fidelity after training. This highlights the need for ongoing and continued support for teachers in the use of EBPs in

classroom-based settings. One way to address this need is through pre-service teacher training. Research has shown that pre-service teachers report a lack of knowledge and training to teach individuals with ASD (Ergul, Baydik, & Demir, 2013). The lack of training and support for teachers can be seen in the numbers of newly certified teachers and students enrolling into education programs. Recent research showed that the 14 Pennsylvania State System of Higher Education colleges education enrollment plunged 36 percent from 2009 to 2015, when 11,583 were enrolled (Palochko, 2016). Policy-makers are attempting to address this need in various ways. Recently, the Pennsylvania Department of Education awarded approximately $2 million in grants to eight universities to develop and implement year-long residency programs for teachers and principals (Pennsylvania Department of Education, 2019). This support is especially important for special education teachers and specifically teachers of students with ASD. Continued pre-service teacher training is imperative to increase the knowledge and training for new autism support teachers to effectively implement EBPs for their students with ASD in classroom-based settings.

It is important to consider that all teachers in the study were new autism support teachers in the school district. Previous research reports on the needs of beginning teachers, including the necessity for assistance in areas related to special education, emotional support, system information related to the school, and materials/resources (Whitaker, 2003). Specifically, the findings of the Whitaker study suggest that beginning teachers benefit from consultation that includes assistance with special education policies, procedures, and paperwork, including Individualized Education Plans (IEP). The findings of the current study are also consistent with previous research, which finds that first year teachers begin to focus on the individual needs of

the students only toward the end of the first year (and often not even then) (Cheney, Krajewski, & Combs, 1992; Fuller & Bown, 1975).

Although end of year data was not collected, it is evident that teachers were not completing student assessment at the beginning of the year, which one can argue would be imperative to successful instruction for students throughout the year. If teachers do not complete as assessment to gain an understanding of their students current and baseline levels, they cannot effectively plan for ongoing instruction. As a result, students may have decreased gains in academic, social, communication and other areas if they are not being taught using effective or appropriate strategies. It is imperative for teachers to complete assessment as early as possible to effectively plan for student instruction throughout the school year. Given the results of low assessment completion in the control group, teachers require additional support and training in the use of curriculum based assessments. This is also consistent with the findings of Whitaker (2003), who found that the beginning special education teachers reported a larges difference between the amount of assistance needed and the amount received in the area of curriculum and instruction. Beginning teachers perceived that they were ready for and needed more assistance in the area of curriculum and instruction than was currently being provided. Collectively, these findings support the need for continued support and consultation for new teachers, especially new special education teachers.

Overall, the study found a significant effect for teacher SLP completion at time-point one for teachers' in the experimental group, but less so over time. It should also be noted that at time two there were five teachers (17%) that completed zero SLP assessments (5 control, 0 experimental), seven teachers (24%) who completed only some of the SLP assessments (three control, four experimental), and 17 teachers (59%) completed all of the SLP assessments (five

control, 12 experimental). The majority of the teachers who completed all student assessments were in the experimental group, which one can argue also supports the use of the commitment emphasis model versus the performance feedback model. Although, over half of the teachers completed all of their student assessments between both groups, there were still teachers who did not complete the student assessment at the middle of the school year. This is an important finding, given the importance of student assessment for planning and progress monitoring. It is also important to note that all teachers had students of varying levels and class sizes. This suggests that the class size or student characteristics may not be a variable in assessment completion. It is possible for teachers to have varying degrees of motivation to complete assessments including students with challenging behaviors, students in litigious situations or students who may be in an inappropriate/ most restrictive environment.

The current study provides evidence that the use of a discrete and scripted consultation model can influence teacher behavior change. Each teacher had a total of three, 1.5 hour consultation visits before the first time point of data collection (October). At this time point, there was a significant difference in assessment completion between groups. Teachers in the experimental group completed a significantly higher number of SLPs at this time, regardless of their class size and consultant. It can be hypothesized that teachers in both groups were facing similar barriers at this time such as all teachers being new to the classroom, new students and limited resources. Given the complexity of consultation models, teacher behavior change and special education classrooms in urban settings, the current study yielded statistically significant and substantive treatment effects. Given previous research that shows scarcity of resources in urban districts, this is an important finding, supporting the idea of a small amount of time committed to the behavior change.

Limitations

Several limitations are present in the current study. Given the main objective of the study was to measure teacher outcomes, there are limited data available on the students in each teacher's classroom. The analyses accounted for the number of students per class, but it did not analyze other student variables that could be related to SLP completion and might differ by condition. However, since data were not collected on individual student characteristics that may differ between teachers (e.g., IEP goals and objectives, academic versus functional curriculum, challenging behaviors), it is not known whether these variables affected teachers' SLP assessment completion. Therefore, it is possible that such student characteristics could have an effect on teacher behavior. Teachers who had students with more challenging behaviors, for example, may have had lower SLP completion due to increased child specific barriers.

Along with potential differences in student outcomes, the study did not control for other classroom barriers such as staffing that could also have affected teachers' SLP data collection. Previous literature supports the idea that teachers who face environmental barriers including decreased financial resources, lack of supplies including curriculum materials, high staff turnover, poor training for specialized populations and other extraneous variables, such as families living at or below the poverty line, face increased challenges in implementation of EBPs (Mandell et al., 2013; Pellechia et al., 2015). It is possible that teachers who faced more environmental barriers could have completed less SLPs due to one or several of the above-mentioned barriers. Although this was not measured in the current study, it is an important factor to consider when supporting long-term sustainability of EBP implementation in urban classrooms.

A third limitation related to the outcomes were that although the time to SLP assessment completion was substantively different, it was not statistically significant. Also, the completion of teacher SLP at time two (January) was substantively different, but not statistically significant. This lack of statistical significance could be attributed to the small sample size of the study and resulting low statistical power. It should be noted that the amount of time between visits was not the same for all teachers, which would affect the dependent variable for research question two. In addition to measures, another limitation is the use of the fidelity form. Coaches self-reported the fidelity scores and this could be a potential limitation in the study and report of fidelity.

In addition, a recent study by Steinberg et al. (2018) reported that special education teachers had the lowest rates of mobility within the school district, which suggests more special education teachers are remaining in their current positions each year. Given this research, it is hypothesized that the sample size could be small due to the increased number of teachers remaining in their current positions (special education and autism support classrooms), specifically in the Philadelphia school district. With a decreased number of teachers' leaving their classrooms, there were fewer autism support teachers new to the district for this school year. This could be due to the district's recent attempts to hire and increase teacher retention. Given the ongoing consultation agreement with the school district, the PhillyAIMS team consults with up to 45 new kindergarten through fifth grade autism support teachers per school year, with 29 teachers identified for consultation in school year 2018-19. Although the turnover rate is high for the entire teaching occupation, it affects beginning teachers more than others, with data showing that after just five years, between 40 and 50 percent of all beginning teachers have left the profession (Ingersoll & Smith, 2003). This is also true in Philadelphia, with the highest mobility among teachers with the fewest years of experience, such as first-year teacher mobility

49

reported at above 50 percent and an average of 27 percent of teachers exited their schools in a given school year, either to transfer to another SDP school or to leave the district (Steinberg et al. 2018), but lower rates among special education teachers.

## Future Research

While researchers have continued to study and identify effective consultation approaches to increase teacher implementation, the research base is still limited, especially in the context of social influence strategies (Noell et al. 2005). This study provides preliminary insight into the use of a commitment emphasis and prompt model of consultation to increase teacher implementation; however, future research is needed. The results of this study showed teachers who were in the commitment emphasis group were more likely to complete student assessments and complete them earlier in the school year. Given the importance of assessment in relation to student goal creation and student achievement (Fuchs, Fuchs & Deno, 1985), it is evident that the use of such a consultation model can increase teacher use of assessment, and therefore contribute to their student goals and outcomes. Future research should focus on the expanded use of social influence strategies to increase teacher implementation specifically related to EBPs and assessment for students' with ASD. Given the effect over time decreased, future research could address this by implementing strategies to increase teacher engagement. One strategy may be the use of reinforcement for teachers based on a social influence strategy. Teachers can be rewarded by administrators through social praise, including an e-mail or other platform to attempt to increase behavior change. Researchers can measure the difference between the use of social praise and other social influence strategies to determine the efficacy over time.

The current study focused on teacher assessment completion based on students per class. Although this showed promising results, it is also important to note that teachers who did not

complete the SLP were not included in the completion analysis (time to completion).  At the final data collection time-point, there were still some teachers who did not complete SLPs for some (24%) or all (17%) of their students. This finding suggests important implications for classroom-based consultants to consider. Although all teachers received a research-based consultation model of either performance feedback or commitment emphasis, there were still a number of teachers who failed to show an increase in their SLP implementation. Future research should attempt to identify additional strategies to increase teacher implementation using additional consultation approaches, including scripted prompts/reminders during consultation visits and e-mail prompts which show promising effects on teacher behavior change in a classroom-based setting (Collier-Meek, Fallon, & DeFouw, 2017; Fallon, Meek, Kurtz & DeFouw, 2018).

Given the limitations of this study including limited student outcomes and a small sample size, future studies should expand on the current study by collecting data on additional variables including classroom factors, including student to staff ratio and student characteristics. Additionally, future studies should attempt to increase the sample size by enrolling a larger number of teacher participants to further validate the commitment emphasis approach.

## Summary

Research on the use of EBPs for individual with ASD has grown over the years, with several reports outlining the strategies with the most promising research base (Odom et al., 2013; Wong et al. 2015). The research base supports the use of several interventions and strategies for individuals with ASD. There is growing research on the use of these EBPs in classroom-based settings, specifically with the use of CTMs. Several CTMs, including STAR, have shown to be effective in increasing student outcomes (Mandell et al. 2013), but additional research shows the

difficulties teachers face in implementing CTMs and EBPs in classroom-based settings with fidelity (Stahmer, Collings & Palinkas, 2005; Mandell et al. 2013; Bacon et al. 2014; Pellecchia et al., 2015).

Given the difficulties teacher face in their classrooms, research also shows the need for increased pre-service teacher training and ongoing support as they enter the workforce. There is a great need for teacher preparation programs to incorporate learning how to use EBP evaluative tools that are effective and easy to understand. The research by Suppo (2016) supports this need and suggests that teacher preparation courses include educating teachers on the importance of maintenance and generalization of newly taught skills across settings when implementing an EBP intervention. This ongoing need for increase knowledge and training of educators can be supported in several capacities including pre-service teacher training, ongoing professional development and consultation.

The use of behavioral consultation strategies in classroom-based settings has continued to show efficacy throughout many studies. The use of performance feedback is the most widely used form of consultation (Burns, Peters & Noell, 2008; Sanetti, & Kratochwill, 2009; Solomon, Klein & Politylo, 2012). Recent research has explored the use of additional approaches including social influence strategies such as commitment emphasis and prompts (Noell et al. 2005). The current study shows preliminary results to support the work by Noell and colleagues, which shows the use of social influence strategies as an effective approach to changing teacher behavior, including the use of intervention implementation and assessment completion. The use of EBPs for individuals with ASD is imperative to the success of students as well as the teachers in classroom-based settings and should be a priority of all clinicians, researchers and educators and policy makers.

REFERENCES CITED

Alexander, J. L., Ayres, K. M., & Smith, K. A. (2015). Training teachers in evidence-based practice for individuals with autism spectrum disorder: A review of the literature. *Teacher Education and Special Education*, 38(1), 13-27.

American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (DSM-V), 5th edn. American Psychiatric Press, Washington.

Arick, J. R., Krug, D. A., Loos, L., & Falco, R. (2004). The STAR Program: Strategies for Teaching Based on Autism Research: Level III. Pro-Ed.

Arick, J. R., Young, H. E., Falco, R. A., Loos, L. M., Krug, D. A., Gense, M. H., & Johnson, S. B. (2003). Designing an outcome study to monitor the progress of students with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities*, 18(2), 75–87.

Bacon, E. C., Dufek, S., Schreibman, L., Stahmer, A. C., Pierce, K., & Courchesne, E. (2014). Measuring outcome in an early intervention program for toddlers with autism spectrum disorder: use of a curriculum-based assessment. *Autism Research and Treatment*, 2014.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191-215.

Burns, M. K., Peters, R., & Noell, G. H. (2008). Using performance feedback to enhance implementation fidelity of the problem-solving team process. *Journal of School Psychology*, 46(5), 537-550.

Busby, R., Ingram, R., Bowron, R., Oliver, J., & Lyons, B. (2012). Teaching elementary children with autism: Addressing teacher challenges and preparation needs. *The Rural Educator*, 33(2).

Cheney, C. O., Krajewski, J., & Combs, M. (1992). Understanding the first year teacher: Implications for induction programs. *Teacher Education and Special Education*, 15(1), 18-24.

Civil Rights Data Collection- Philadelphia City SD. (2015). Retrieved October 21, 2018, from https://ocrdata.ed.gov/Page?t=d&eid=27031&syk=8&pid=2278

Collier-Meek, M. A., Fallon, L. M., & DeFouw, E. R. (2017). Toward Feasible Implementation Support: E-Mailed Prompts to Promote Teachers' Treatment Integrity. *School Psychology Review*, 46(4), 379-394.

Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis*.

Dawson, G., Rogers, S., Munson, J., Smith, M., Winter, J., Greenson, J., & Varley, J. (2010).

Randomized, controlled trial of an intervention for toddlers with autism: The Early Start Denver model. *Pediatrics*, 125(1), e17–e23.

Dewey, J., Sindelar, P. T., Bettini, E., Boe, E. E., Rosenberg, M. S., & Leko, C. (2017). Explaining the decline in special education teacher employment from 2005 to 2012. *Exceptional Children*, *83*(3), 315-329.

Ergul, C., Baydik, B., & Demir, S. (2013). Opinions of In-Service and Pre-Service Special Education Teachers on the Competencies of the Undergraduate Special Education Programs. *Educational Sciences: Theory and Practice*, 13(1), 518-522.

Fallon, L. M., Collier-Meek, M. A., Kurtz, K. D., & DeFouw, E. R. (2018). Emailed implementation supports to promote treatment integrity: Comparing the effectiveness and acceptability of prompts and performance feedback. *Journal of School Psychology*, 68, 113-128.

Fischell, R. E., Fountain, G. H., & Blackburn, C. M. (1984). *U.S. Patent No. 4,440,160*. Washington, DC: U.S. Patent and Trademark Office.

Fore, C., Martin, C., & Bender, W. N. (2002). Teacher burnout in special education: The causes and the recommended solutions. *The High School Journal*, 86(1), 36-44.

Fuchs, L. S., Fuchs, D., & Deno, S. L. (1985). Importance of goal ambitiousness and goal mastery to student achievement. *Exceptional Children*, 52(1), 63-71.

Fuller, F. F., & Bown, O. H. (1975). Teacher education: The 74th yearbook of the national society for the study of education (Part II). Chicago: The University of Chicago.

Gilbertson, D., Witt, J. C., Singletary, L. L., & VanDerHeyden, A. (2007). Supporting teacher use of interventions: Effects of response dependent performance feedback on teacher implementation of a math intervention. *Journal of Behavioral Education*, 16(4), 311-326.

Goodman, N. W. (2003). Ethics and evidence-based medicine: Fallibility and responsibility in Clinical science. *Journal of the Royal Society of Medicine*, 96(5), 251.

Grey, I. M., Honan, R., McClean, B., & Daly, M. (2005). Evaluating the effectiveness of teacher training in Applied Behaviour Analysis. *Journal of Intellectual Disabilities*, 9(3), 209-227.

Graham, K. A. (2018, July 12). The teacher supply is plummeting. Pa. will spend $2M to stem the tide. Retrieved November 11, 2018, from http://www2.philly.com/philly/education/teacher-supply-plummeting-pa-governor-wolf-grants-2m-recruitment-retention-20180712.html

Hadadian, A., & Chiang, L. (2007). Special Education Training and Preservice Teachers. *International Journal of Special Education*, 22(1), 103-106.

Hess, K. L., Morrier, M. J., Heflin, L. J., & Ivey, M. L. (2008). Autism treatment survey: Services received by children with autism spectrum disorders in public school classrooms. *Journal of Autism and Developmental Disorders*, 38(5), 961-971.

Ingersoll, R. M., & Smith, T. M. (2003). The wrong solution to the teacher shortage. *Educational leadership*, *60*(8), 30-33.

Kenny, M. (2002). Integrated movement therapy™: Yoga-based therapy as a viable and effective intervention for autism spectrum and related disorders. *International Journal of Yoga Therapy*, 12(1), 71-79.

Koegel, L. K., Koegel, R. L., Harrower, J. K., & Carter, C. M. (1999). Pivotal response intervention I: Overview of approach. *Journal of the Association for Persons with Severe Handicaps*, *24*(3), 174-185.

Leblanc, L., Richardson, W., & Burns, K. A. (2009). Autism spectrum disorder and the inclusive classroom: Effective training to enhance knowledge of ASD and evidence-based practices. *Teacher Education and Special Education*, 32(2), 166-179.

Lopata, C., Thomeer, M. L., Volker, M. A., Lee, G. K., Smith, T. H., Smith, R. A., & Toomey, J. A. (2012). Feasibility and initial efficacy of a comprehensive school-based intervention for high functioning autism spectrum disorders. *Psychology in the Schools*, 49(10), 963–974.

Lord, C., Risi, S., DiLavore, P. S., Shulman, C., Thurm, A., & Pickles, A. (2006). Autism from 2 to 9 years of age. *Archives of General Psychiatry*, 63(6), 694-701.

Mandell, D. S., Listerud, J., Levy, S. E., & Pinto-Martin, J. A. (2002). Race differences in the age at diagnosis among Medicaid-eligible children with autism. *Journal of the American Academy of Child & Adolescent Psychiatry*, *41*(12), 1447-1453.

Mandell, D. S., Stahmer, A. C., Shin, S., Xie, M., Reisinger, E., & Marcus, S. C. (2013). The role of treatment fidelity on outcomes during a randomized field trial of an autism intervention. *Autism*, 17(3), 281–295.

Mortenson, B. P., & Witt, J. C. (1998). The use of weekly performance feedback to increase teacher implementation of a prereferral academic intervention. *School Psychology Review*, 27(4), 613.

National Autism Center. (2015). Findings and conclusions: National standards project, phase 2. Randolph, MA: Author

National Research Council. (2001). *Educating children with autism*. Washington, Dc: National Academy Press.

Noell, G. H., Witt, J. C., Gilbertson, D. N., Ranier, D. D., & Freeland, J. T. (1997). Increasing teacher intervention implementation in general education settings through consultation and performance feedback. *School Psychology Quarterly*, 12(1), 77.

Noell, G. H., Witt, J. C., LaFleur, L. H., Mortenson, B. P., Ranier, D. D., & LeVelle, J. (2000). Increasing intervention implementation in general education following consultation: a comparison of two follow-up strategies. *Journal of Applied Behavior Analysis*, 33(3), 271-84.

Noell, G. H., Witt, J. C., Slider, N. J., Connell, J. E., Gatti, S. L., Williams, K. L., ... & Duhon, G. J. (2005). Treatment implementation following behavioral consultation in schools: A comparison of three follow-up strategies. *School Psychology Review*, 34(1), 87-107.

McKibbon, K. A. (1998). Evidence-based practice. *Bulletin of the Medical Library Association*, 86(3), 396–401.

Mesibov, G. B., Shea, V., & Schopler, E. (2005). The TEACCH approach to autism spectrum disorders. Springer Science & Business Media.

Morrier, M. J., Hess, K. L., & Heflin, L. J. (2011). Teacher training for implementation of teaching strategies for students with autism spectrum disorders. *Teacher Education and Special Education*, 34(2), 119-132.

Odom, S. L., Boyd, B. A., Hall, L. J., & Hume, K. (2010). Evaluation of comprehensive treatment models for individuals with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 40(4), 425-436.

Odom, S. L., Collet-Klingenberg, L., Rogers, S. J., & Hatton, D. D. (2010). Evidence-based Practices in interventions for children and youth with autism spectrum disorders. *Preventing School Failure: Alternative Education for Children and Youth*, 54(4), 275-282. doi:10.1080/10459881003785506

O'Keefe, D. J., & Medway, F. J. (1997). The application of persuasion research to consultation in school psychology. *Journal of School Psychology*, 35(2), 173-193.

Palochko, J. (2016). Pennsylvania state colleges try to stave off teacher shortage as fewer decide to major in education. Retrieved March 25, 2019, from https://www.mcall.com/news/local/mc-pennsylvania-colleges-teacher-shortage-20161105-story.html

Partington, J. W. (2010). The assessment of basic language and learner skills-revised (ABLLS-R). Pleasant Hill, CA: Behavior Analysts, Inc.

Pellecchia, M., Connell, J. E., Beidas, R. S., Xie, M., Marcus, S. C., & Mandell, D. S. (2015). Dismantling the active ingredients of an intervention for children with autism. *Journal of autism and developmental disorders*, *45*(9), 2917-2927.

Pennsylvania Department of Education. (2019). Innovative Teacher and Principal Residency

Programs Grant. Retrieved March 25, 2019, from https://www.education.pa.gov/Teachers - Administrators/Teacher Quality/Pages/Innovative-Teacher-and-Principal-Residency-Programs-Grant.aspx

Pennsylvania Department of Education. (2016). Autism Spectrum Disorders Program Endorsement. Retrieved March 22, 2019, from https://www.education.pa.gov/Documents/Teachers-Administrators/Certification%20Preparation%20Programs/Specific%20Program%20Guidelines/AutismSpectrumDisorders_Endorsement%20Guidelines.pdf

Pennsylvania Department of Education. (2018). Special Education Data Reporting. Retrieved October 21, 2018, from https://penndata.hbg.psu.edu/PublicReporting/DataataGlance/tabid/2523/Default.aspx

Rogers, S., & Vismara, L. (2008). Evidence-based comprehensive treatments for early autism. *Journal of Clinical Child and Adolescent Psychology*, 37, 8–38

Romanczyk, R. G., Gillis, J. M., White, S., & Digennaro, F. (2008). Comprehensive treatment packages for ASD: Perceived vs proven effectiveness. *Clinical Assessment and Intervention for Autism Spectrum Disorders* (351-381). Academic Press.

Ruble, L. A., Usher, E. L., & McGrew, J. H. (2011). Preliminary investigation of the sources of self-efficacy among teachers of students with autism. *Focus on Autism and Other Developmental Disabilities*, 26(2), 67-74.

Sackett, D. L., Rosenberg, W. M., Gray, J. A., Haynes, R. B., & Richardson, W. S. (1996). Evidence based medicine: What it is and what it isn't. *BMJ (Clinical Research Ed.), 312*(7023), 71-72.

Sanetti, L. M. H., & Kratochwill, T. R. (2009). Treatment integrity assessment in the schools: An evaluation of the Treatment Integrity Planning Protocol. *School Psychology Quarterly*, 24(1), 24.

Scheuermann, B., Webber, J., Boutot, E. A., & Goodwin, M. (2003). Problems with personnel preparation in autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities*, 18(3), 197-206.

Simpson, R. L., de Boer-Ott, S. R., Griswold, D. E., Myles, B. S., Byrd, S. E., Ganz, J. B., et al. (2005). Autism spectrum disorders: Interventions and treatments for children and youth. Thousand Oaks, CA: Corwin Press.

Slocum, T. A., Detrich, R., Wilczynski, S. M., Spencer, T. D., Lewis, T., & Wolfe, K. (2014). The evidence-based practice of applied behavior analysis. *The Behavior Analyst*, 37(1), 41-56.

Solomon, B. G., Klein, S. A., & Politylo, B. C. (2012). The effect of performance feedback on

teachers' treatment integrity: A meta-analysis of the single-case literature. *School Psychology Review*, 41(2).

Stahmer, A. C., Collings, N. M., & Palinkas, L. A. (2005). Early intervention practices for children with autism: Descriptions from community providers. *Focus on Autism and Other Developmental Disabilities*, 20(2), 66–79.

Stahmer, A. C., Rieth, S., Lee, E., Reisinger, E. M., Mandell, D. S., & Connell, J. E. (2015). Training teachers to use evidence-based practices for autism: Examining procedural implementation fidelity. *Psychology in the Schools*, 52(2), 181-195.

Steinberg, M., Neild, R., Canuette, W.K., Park, S., Schulman, E., & Wright, M. (2018*). Teacher mobility in the School District of Philadelphia*, *2009-10 through 2015-16*. Philadelphia: The Philadelphia Education Research Consortium.

Suppo, J. L. (2016). Two Models for Evaluating Evidence-based Practices in Autism. *Journal of Research Initiatives*, 2(2), 5.

Tostanoski, A., Lang, R., Raulston, T., Carnett, A., & Davis, T. (2014). Voices from the past: Comparing the rapid prompting method and facilitated communication. *Developmental Neurorehabilitation*, 17(4), 219-223.

Tucci, V., Hursh, D., Laitinen, R., & Lambe, A. (2005). Competent learner model for individuals with autism/PDD. *Exceptionality*, 13(1), 55-63.

University of North Carolina School of Medicine. (2011). TEACCH autism program. (n.d.). Retrieved March 22, 2019, from http://teacch.com/

U.S. Census Bureau QuickFacts: Philadelphia County, Pennsylvania; Pennsylvania. (2017, July 01). Retrieved October 21, 2018, from https://www.census.gov/quickfacts/fact/table/philadelphiacountypennsylvania,pa/PST045217

Wesson, C. L., King, R. P., & Deno, S. L. (1984). Direct and frequent measurement of student performance: If it's good for us, why don't we do it? *Learning Disability Quarterly*, 7(1), 45–48. https://doi.org/10.2307/1510260

Whitaker, S. D. (2003). Needs of beginning special education teachers: Implications for teacher education. *Teacher Education and Special Education*, 26(2), 106-117.

Wong, C., Odom, S. L., Hume, K. A., Cox, A. W., Fettig, A., Kucharczyk, S., ... & Schultz, T. R. (2015). Evidence-based practices for children, youth, and young adults with autism spectrum disorder: A comprehensive review. *Journal of Autism and Developmental Disorders*, 45(7), 1951-1966.

## Appendix A

Coach Fidelity Form

| | |
|---|---|
| | **Initial Visit Only** |
| | Review data collection in consultation agreement |
| | When discussing Student Learning Profiles, state they are a great tool to use for baseline assessments for your students and we hope you are able to complete them for your students. |
| | Included in 60-day report to be sent to your Principal |
| | **Visits 2 and 3** |
| | Follow implementation checklist and typical consultation schedule based on teacher's needs. Do not remind teachers to complete the SLPs outside of the implementation checklist progress. |
| | Remind teachers this is part of the contract they signed. |
| | Remind teacher that SLP assessments are part of the district-selected curriculum. |
| | Remind teacher that other AS teachers in the district use this assessment |
| | Remind teachers it will be included in the 60-day report sent to Principal |

| | |
|---|---|
| Total # of steps followed | |
| Total # of steps (N/A omitted): | |
| Percent followed: | |
| Notes: | |