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Concordia University–Portland

College of Education

Doctorate of Education Program

WE, THE UNDERSIGNED MEMBERS OF THE DISSERTATION COMMITTEE

CERTIFY THAT WE HAVE READ AND APPROVE THE DISSERTATION OF

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Procedural Integrity: A Study of Implementation Integrity Utilizing Fidelity Checks and Performance Feedback

Kristin Johnson

Concordia University–Portland

College of Education

Dissertation submitted to the Faculty of the College of Education

in partial fulfillment of the requirements for the degree of

Doctor of Education in

Higher Education

Heather Miller, Ph.D., Faculty Chair Dissertation Committee

Jillian Skelton, Ed.D., Content Specialist

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Concordia University–Portland

2017

Abstract

This action research study examined the experiences of professional and support staff at a suburban Philadelphia school district regarding the increased frequency of fidelity checks for behavior protocols. Based on interview data, all participants reported positive experiences throughout this action research study. All participants contributed to the two actions that took place during the action research study. These two actions comprised the implementation of biweekly team meetings and the development of Google Drive folders for students. The relationship between frequency of fidelity checks of behavior protocols and accuracy of intervention implementation was also examined. The data supported the notion: The more fidelity checks provided to staff, the more accurate their protocol implementation. The relationship between frequency of fidelity checks of behavior protocols and problem behavior showed that all three students decreased their problem behavior throughout the course of this study. The relationship between frequency of fidelity checks of behavior protocols and skill acquisition showed that all three students increased their overall skill acquisition. This action research study demonstrated significant benefits to the use of fidelity check. While further research may assess specific intervals at which these fidelity checks are needed for ongoing supervision, the results of this action research study are clear: Increased frequency of fidelity checks results in positive experiences for staff, more accurate implementation of protocols, reduced problem behavior, and higher skill acquisition of students with special needs.

Keywords: applied behavior analysis, functional behavior assessment, Accepting No protocol, Wait protocol, skill acquisition.

Dedication

This dissertation is dedicated to my husband, Tony. Just a few short months after we married, I started this journey towards earning my doctorate. You spent our first 4 years of marriage sharing me with Concordia, as I spent countless late nights and early mornings on my computer. Over those 4 years, we welcomed two perfect baby girls to our family. While I worked endlessly on schoolwork, you cared for babies, cleaned the house, and made sure we had something to eat for dinner. No large or small task of yours went unnoticed! You have supported this dream of mine, and I am forever grateful. Without you, I would not have accomplished this.

Acknowledgments

I would like to express my sincere appreciation to my committee chair, Dr. Heather Miller. It was with her dedication and genuine belief in me as a scholar that I was able successfully to complete this dissertation. Without her warm, but direct feedback and kind, but persistent encouragement, I would not have succeeded. Thank you!

I would also like to thank my committee members, Dr. Skelton and Dr. Roland, whose direct and honest feedback allowed me to grow as a scholar. I appreciate your timely and detailed feedback that challenged my intellectual growth and encouraged me to advance as a learner.

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Chapter 1: Introduction

When school staff implement behavior protocols with fidelity, these protocols are effective in changing problem behavior (Parsons, Rollyson, & Reid, 2012). However, if staff is inadequately trained or forced to juggle several different behavior plans simultaneously, this can result in the lack of implementation fidelity (Haggermoser-Sanetti, Collier-Meek, Long, Kim, & Kratochwill, 2014; Liaupsin, 2015). Frequent fidelity checks ensure quality assurance is occurring on the specific programming as outlined in students' individual education programs (IEPs). Conversely, frequent fidelity checks can result in quality control of onsite monitoring and training when it is required in order to remedy protocol implementation (Haggermoser-Sanetti et al., 2014; Liaupsin, 2015).

A review of the literature suggests that treatment integrity is a complex construct. The push for inclusion in schools has resulted in more students with increased behavioral needs within the general education classroom (NPSD, 2015-2016, p. 8). This increase in behavioral needs has subsequently resulted in a need for more behavioral supports and recommendations to be implemented across educational environments. These supports and recommendations are often designed and discussed during meetings or training sessions but with little to no follow up on the fidelity of the recommendations. Current practice demonstrates a gap in the fidelity of behavior protocol implementation, suggesting additional research be conducted (Haggermoser-Sanetti et al., 2014).

Background, Context, History, and Conceptual Framework for the Problem

The fidelity of behavior protocol implementation is critical in determining the success of the intervention (Cooper, Heron, & Heward, 2007). Protocols must be followed consistently and accurately to ensure fidelity with the goal to ultimately change behavior as desired in the protocol

(Cooper et al., 2007). Using fidelity checks, administrators can measure the integrity of interventions and train staff on implementation accuracy.

The surgeon general recognized applied behavior analysis (ABA) as an effective treatment for individuals with autism (Cooper et al., 2007). Applied behavior analysis is used to develop interventions effective in reducing maladaptive behavior, as well as increasing language development, overall communication, learning ability, and socially appropriate behaviors (Cooper et al., 2007). The behavior protocols and fidelity checks of this study were developed based on the principles of ABA and followed the guidelines set forth by the surgeon general.

This study embraced a constructivist approach to examine the relationship between participants' experiences and students' behaviors (Creswell, 2003; Stringer, 2014). The fidelity checks served as the measure of accuracy that were used for follow-up discussion and training with staff who implemented the behavior protocols. Ongoing discussion and training occurred with staff as the fidelity checks were reviewed at the end of specific observations. At the close of the study, participants took part in an interview targeting specific questions surrounding their experiences while involved in the study. With a constructivist approach, the behaviors of the participants were examined as performance feedback was provided following each fidelity check (Creswell, 2003; Stringer, 2014). Participants' behavior, specifically that of their increased accuracy in implementing the behavior protocol was to be examined following their experiences with receiving performance feedback.

This chapter discusses the complexities of treatment integrity through a review of related literature from school psychology, behavioral psychology, education, and applied behavior analysis. Several variables influenced this research and affected the overall expected findings. One variable

specific to the influence of the study is the fidelity of integrity checks for specific interventions. According to Bruce, DiNovak, Perrin, and Prograr (2001), "Closely monitored treatment integrity of local school staff was responsible for the implementation of behavioral interventions" (p. 29). This illustrates one additional variable that influenced the research of the study, the competency of the professionals implementing the intervention. This competency was based on the overall skill set of the implementing professionals. In sum, staff who are not trained efficiently or who lack the necessary skills to implement a specific intervention protocol may not implement it accurately, and the fidelity of the intervention protocol may be compromised. Problem behaviors may increase, resulting in less learning time and a slower rate of skill acquisition. The converse—better training—will improve the same measures.

Statement of the Problem

Largely unknown are the experiences of the staff implementing behavior reduction protocols with fidelity in a large Philadelphia suburban school district. The population affected by this problem includes the teachers, paraprofessionals, and ancillary service providers who are responsible for implementing the behavior reduction protocols of individual students with Accepting No and Wait protocols identified in their IEPs. Specific behavior reduction protocols are systematically designed to be implemented with explicit step-by-step procedures designed to change behavior. Any deviation from these identified procedures compromises the fidelity of the plan, and ultimately the behavior may not change at the rate or intensity at which it may if the protocol were implemented with fidelity (Carroll, Kodak, Fishner, 2013; Collier-Meek, Sanetti, Fallon, 2017; Cooper et al., 2007; Parsons et al., 2012). This study was designed to examine the

effects fidelity checks have on behavior protocol implementation accuracy, the reduction of problem behavior, and overall skill acquisition for the learner.

Purpose of the Study

The purpose of this study was to better understand the experiences of staff implementing behavior reduction protocols within a large Philadelphia suburban school district. The focus was the effectiveness of increased frequency of fidelity checks for behavior protocols. Utilizing a partnership model, I worked as an evaluator with administrators, teachers, paraprofessionals, and ancillary service providers to implement this study. A high level of collaboration was necessary due to the intricacies related to treatment integrity and the legal implications, which could result due to failure to implement treatment with integrity.

Research Questions

The research question for this study was: What are the experiences of professional and support staff at a suburban Philadelphia school district regarding the increased frequency of fidelity checks for behavior protocols?

Three subquestions follow:

1. What is the relationship between frequency of fidelity checks of behavior protocols and accuracy of intervention implementation?
2. What is the relationship between frequency of fidelity checks of behavior protocols and problem behavior?
3. What is the relationship between frequency of fidelity checks of behavior protocols and skill acquisition?

Rationale, Relevance, and Significance of the Study

Fidelity checks specific to the recommended behavior intervention eliminated the questionability of staff report within observational data. Increased compliance is directly correlated to the level of treatment integrity in place (Iwata, DeLeon, & Roscoe, 2013). Therefore, specific behaviors such as compliance can be directly correlated to increased skill acquisition with the presence of fidelity checks, and follow-up consultation of integrity increased the likelihood of treatment implementation.

The importance of fidelity checks specific to behavior intervention recommendations is the direct correlation behavior plays in skill acquisition (Weiss, 1999). Lack of fidelity with behavior intervention programs results in a slower rate of skill acquisition, and therefore the learner makes less progress in all areas of skill development (Lindhiem, Higa, Trentacosta, Herschell, & Kolko, 2014). This lack of skill acquisition can be a direct result of the amount of time spent on managing, or mismanaging behaviors, rather than having additional time to spend on appended skill development outside of behavior (Lindhiem et al., 2014).

The population and diverse learner needs in the public school setting are drastically changing with the laws surrounding the least restrictive environment and increasing the need for behavior intervention recommendations. However, interventions are not being implemented as designed in order to treat the function of behavior. For this reason, when behavioral interventions are recommended to a team or program, integrity checks are needed to ensure skill acquisition increases. Third-party support evaluators are needed to ensure implementation is performed as intended.

Definition of Terms

Applied behavior analysis. "The process of systematically applying interventions based upon the principles of learning theory to improve socially significant behaviors to a meaningful degree, and to demonstrate that the interventions employed are responsible for the improvement in behavior" (Cooper et al., 2007, p. 7).

Treatment integrity. Within this study, the term refers to the close monitoring of accurate implementation of behavior interventions by staff (Bruce et al., 2001).

Fidelity checks. Scheduled observations to ensure individual steps of designed interventions are implemented as intended (Mayer, Sulzer-Azaroff, & Wallace, 2014).

Action research. A "collaborative approach to inquiry or investigation that provides people with the means to take systemic action to resolve specific problems" (Stringer, 2007, p. 8).

Stringer's (2007) basic framework of action research is built on the model of Look, Think, Act. This model allows participants to initiate their inquiries in a direct manner and build the details of the process as the intricacies of the issues arise in the study (Stringer, 2007). Within this model there are three stages, but the model is a continuous set of recycling activities. During the *look* stage data are gathered and a picture is built to describe the situation. Within the *think* stage explorations, analysis, and theorization occur. This phase identifies what is happening, and how or why things are the way they are. In the *act* stage the implementation and evaluation occur. This is where specific actions occur as a result of the data taken. Figure 1 is a visual rendition of the Stinger model.

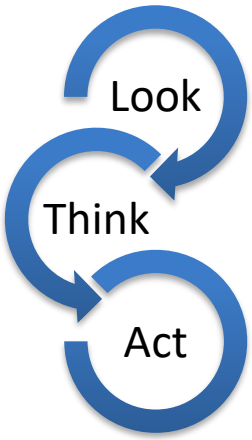


Figure 1. Stringer's (2007) model of *Look, Think, Act.*

Although there are three identified stages, participants constantly review their observation, reflection, and action throughout the process. Upon completing each set of activities, participants review, reflect, and re-act (Stringer, 2007). The re-act is the portion of the process in which the actions occur. Stringer noted, "Action research is not a neat, orderly activity that allows participants to proceed step-by-step to the end of the process" (p. 8).

Delimitations and Limitations

Limitations. Limitations of the study included the purposeful sampling of the study and the observation periods in which the fidelity checks were completed. The location and access to participants determined their level of recruitment. Staff were recruited based on their assignment to work with students with specific behavior protocols identified within their IEPs within a particular building and with students with either an "Accepting No" or "Wait" protocol in their IEP.

Participants were given the option to discontinue the study at any point. Because of purposeful sampling, the results of the study cannot be generalized to a larger population without replication of a larger sampling (Simon, 2011).

Another limitation to the study was the time defined observation period of the fidelity checks (Simon, 2011). Potentially, the 1-hour observation period could occur with no observable behavior for the staff to implement the protocol. Alternatively, it is not logistically possible for the evaluator to observe for fidelity checks throughout the entire school day so the data collection sampling was limited.

Delimitations. Delimitations are defined as those characteristics that "limit the scope and define the boundaries of your study" (Simon, 2011, p. 2). A delimitation to this study was the identification of a single problem while rejecting other potential problems (Simon, 2011). A second delimitation was the incorporation of two behavior protocols rather than one. Two protocols have been identified to allow for more observable data points. The third delimitation was the population of the purposeful sampling (Simon, 2011). The study occurred in an autism support classroom within a suburban Philadelphia school district. Participants were recruited based on their assignment to work with students who have particular behavior protocols noted within their IEPs.

Summary

This study examined the experiences of staff implementing behavior specific protocols when provided with fidelity checks and performance feedback regarding the protocol implementation. I examined the effects of the fidelity checks, specifically that of the accuracy of protocol implementation, the reduction of problem behavior, and the overall skill acquisition of the

learner. These experiences were assessed through both the fidelity checks of protocol implementation, as well as through a postinterview completed by participants.

Chapter 2 entails a review of literature on applied behavior analysis, the Verbal Behavior Milestones Assessment and Placement Program (VB-Mapp), functional behavior assessments (FBA), treatment integrity, and skill acquisition. Each of these topics is a key attribute to the overall programming designed, which has identified the need for the behavior protocol being monitored for fidelity, as well as the literature on assessment and fidelity itself. Chapter 3 reviews the step-by-step methods and procedures that were used to conduct this study. This study contains both qualitative and quantitative measures of the data collection procedures. Chapter 4 details the data analysis and results discovered throughout the study, and in Chapter 5 results of the study are discussed.

Chapter 2: Literature Review

This chapter begins by introducing the science of applied behavior analysis (ABA), an important construct in which the study based all principles of teaching. The VB-MAPP: Verbal Behavior Milestones and Placement Program is discussed, as this is the primary tool of assessment in the classroom in which the study took place. Functional behavior assessments (FBAs) are reviewed as the fundamental behavior assessment used within the field of ABA. Specific behavior protocols are then developed based on the results of such assessments. Treatment integrity and skill acquisition are discussed in terms of the procedural implementation and measurement of intervention accuracy, as well as the rate of acquiring new skills. Skill acquisition is discussed to clarify how ABA treatment can reduce students' problem behavior and how such behaviors affect the overall instructional time and students' skill acquisition.

Conceptual Framework

Implementation fidelity of designed behavior protocols is paramount in the success of the interventions (Cooper et al., 2007). It is essential that protocols are implemented as designed in order to ensure fidelity and change the target behavior (Cooper et al., 2007). Utilizing fidelity checks increases the integrity of interventions, and can be used as a tool in training staff for better implementation accuracy.

Based on the empirical research of applied behavior analysis (ABA), the Surgeon General recognizes behavioral therapy, specifically ABA, as effective treatment for individuals with autism (Cooper et al., 2007). Applied behavior analysis is utilized in developing interventions effective in reducing maladaptive behavior, as well as, increasing language development, overall communication, learning ability and socially appropriate behaviors (Cooper et al., 2007). The

behavior protocols and fidelity checks of this study were developed based on the principles of applied behavior analysis, and followed the guidelines set forth by the surgeon general.

This study embraced a constructivist approach to the conceptual framework. It defined "outcomes in ends that are acceptable to stakeholders, rather than those whose degree of success may be measured against some set of fixed criteria" (Stringer, 2007, p. 141). Through a constructivist approach the study examined the relationship between one's experiences and their behaviors. The fidelity checks served as the measure of accuracy that was used for follow-up discussion and training with staff that were implementing the behavior protocols. Ongoing discussion and training occurred with staff as the fidelity checks were reviewed at the end of specific observations. At the close of the study participants completed an interview targeting specific questions surrounding their experiences while participating in the study. With a constructivist approach the behaviors of the participants were examined as performance feedback was provided following each fidelity check. Participant's behavior, specifically that of their increased accuracy in implementing the behavior protocol was examined following their experiences with receiving performance feedback.

This chapter conceptualized the complex intricacies of treatment integrity through a literature review of school psychology, behavioral psychology, education, and applied behavior analysis. There are several variables that influenced this research, and impacted the overall hypothesis of this study. One variable specific to the influence of the study was the fidelity of integrity checks for specific interventions. According to Bruce et al. (2001), "Closely monitored treatment integrity for local school staff responsible for the implementation of behavioral interventions" (p. 29). This illustrates an additional variable influencing the research of the study,

the competency of the professionals implementing the intervention. This competency was based on the overall skill set of the implementing professionals. In sum, staff that were not trained efficiently, or possess the necessary skills to implement a specific intervention protocol, would not implement such with accuracy and the fidelity of the intervention protocol was compromised. This inaccurate implementation resulted in higher rates of problem behavior being exhibited and ultimately impacted the amount of learning time the student encountered. Less learning time resulted in a slower rate of skill acquisition. Therefore, increasing the fidelity of intervention protocols would result in less time addressing problem behavior and increase the overall amount of learning time for a student. This increase of learning time subsequently increased students' overall skill acquisition.

Review of Research Literature and Methodological Literature

Applied Behavior Analysis

Applied behavior analysis is "the process of systematically applying interventions based upon the principles of learning theory to improve socially significant behaviors to a meaningful degree, and to demonstrate that the interventions employed are responsible for the improvement in behavior" (Cooper et al., 2007, p. 7). The primary focus of ABA is the assessment and follow-up intervention of identified behaviors that are targeted for either acquisition as replacement behaviors, or reduction as problematic behaviors (Cooper et al., 2007; Granpeesheh, Tarbox, & Dixon, 2009; Greenwald, Roose, & Williams, 2015). Throughout this intervention, behavior is changed by modifying events that occur directly before and after the targeted behavior (Cooper et al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015). When behavior analysts apply the principles of ABA in the treatment of problem behavior, they manipulate the learning environment (Cooper et

al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015) by changing, for example, instructional materials, people, or time of day in which the behavior occurs (Cooper et al., 2007).

Principles of applied behavior analysis. The basic principles of ABA include learning and motivation, stimulus control, extinction, reinforcement, and generalization (Cooper et al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015). At the core of ABA, behaviors are shaped by implementing and manipulating consequences to either strengthen or weaken the target behavior (Cooper et al., 2007). This change is achieved through either presenting a preferred stimulus or removing a nonpreferred stimulus, resulting in the strengthening of a behavior, otherwise known as reinforcement (Cooper et al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015). Removing a stimulus results in a weakened targeted behavior, which ABA refers to as punishment (Cooper et al., 2007). Through the systematic presentation of consequences, as a result of an identified target behavior, the environment is manipulated to ultimately result in the increase or decrease of future occurrences of a behavior and eventually its extinction (Cooper et al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015).

Conversely, the repeated presentation of preferred reinforcers, simultaneous to the presence of other stimuli, results in the other stimuli becoming positively associated with reinforcement and increasing the likelihood that stimuli yielding similar results of the original behavior is referred to as conditioned reinforcement (Cooper et al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015). When a specific behavior is reinforced as a result of a specific antecedent, the behavior will ultimately occur only in the presence of the specified antecedent, which is referred to as stimulus control (Granpeesheh et al., 2009). Lastly, the principle of generalization involves the effects of

learning transferring to other circumstances from that which they were taught (Granpeesheh et al., 2009).

Procedures of applied behavior analysis. The procedures of teaching prompting, fading, shaping, and chaining are implemented using the principles of ABA, such as reinforcement, extinction, stimulus control, and generalization (Cooper et al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015). Prompting refers to the directional cues one requires to make a behavior occur that would otherwise not happen (Cooper et al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015). Prompting is a temporary measure to evoke the targeted response in order to then reinforce that behavioral response (Cooper et al., 2007). Once the prompted response is emitted, fading occurs. Fading involves systematically removing the prompt so that the desired behavioral outcome continues to occur without such prompting (Cooper et al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015). The teaching procedure of shaping involves successfully reinforcing approximations of an identified target behavior to be reinforced (Cooper et al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015). Lastly, chaining is a teaching procedure used to teach extended sequences of behaviors by systematically breaking down the task into small steps. Each step is then explicitly taught through prompting and reinforcement, resulting in a chain of several behaviors (Cooper et al., 2007).

Teaching formats of applied behavior analysis. Based on the principles and procedures described, teaching formats are developed to identify and teach target skills for acquisition (Cooper et al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015). Discrete trial training (DTT) is a structured teaching format wherein isolated opportunities, called discrete trials, are presented to the student throughout the day by instructional staff (Cooper et al., 2007). The individual discrete trial

is initiated by staff presenting instruction, then the learner responding, and finally the staff presenting a consequence (Cooper et al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015). If the learner responds accurately, the consequence is in the form of reinforcement. However, if the learner responds incorrectly, rather than an immediate reinforcer, the staff member will present a corrective procedure with prompting before initiating another discrete trial (Cooper et al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015). Discrete trial training is unique in its teaching format in that it involves repetitive trials presented within a short period of time, which provides the learner with a large number of learning opportunities (Cooper et al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015). One of the negative aspects of DTT is that the structured learning setting may limit the generalization of skills outside of the training format (Cooper et al., 2007).

While discrete trial training is highly structured and involves a contrived teaching environment, natural environment training (NET) replicates naturally occurring learning opportunities (Cooper et al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015). NET focuses on skill instruction in an environment and format that the learner would typically encounter within his or her daily routine (Cooper et al., 2007). Additionally, when utilizing NET, the discrete trials are initiated by the learner, as opposed to the staff (Cooper et al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015). That initiation can include reaching, pointing, or vocalizing a desire, and the staff responds to this learning opportunity by prompting a response if needed, and immediately delivering reinforcement thereafter (Cooper et al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015). Natural environment training increases the opportunities for generalization of skills (Cooper et al., 2007). While most ABA programs consist primarily of discrete trial training and natural environment training components, additional training formats are based on the principles of ABA,

such as script-fading, video-modeling, picture activity schedules, and peer-mediated social skills training procedures (Cooper et al., 2007; Granpeesheh et al., 2009; Greenwald et al., 2015). The comprehensive programs are designed to target each identifiable area of deficit, explicitly identifying skills for programming (Cooper et al., 2007). One tool based on the principles of ABA that assists in the guidance of identifying such target skills is the Verbal Behavior Milestones Assessment Placement Program (VB-MAPP).

VB-MAPP: Verbal Behavior Milestones Assessment Placement Program

The Verbal Behavior Milestones Assessment Placement Program (VB-MAPP) is based on B. F. Skinner's *Verbal Behavior* (1957), the benchmark analysis in the study of language, as well as Skinner's theory of behavioral science known as applied behavior analysis. Skinner's model of verbal behavior consists of an analysis of the events that occur before and after one speaks and how those events alter the future frequency of what is often termed communication (Sundberg, 2008). Verbal behavior is defined as behavior that is maintained through the specific actions of the listener (Skinner, 1957). As with all types of behavior, verbal behavior follows the same principles in that the events directly before and after the behavior are strongly correlated to our verbal behavior itself (Sundberg, 2008). When referring to verbal behavior, vocal responses and the use of sign language, gestures, writing, and all forms of augmentative communication are included (Barnes, Mellor, Rehfeldt, 2014; Sundberg, 2008).

VB-MAPP milestones assessment. The VB-MAPP is composed of five components, including the VB-MAPP Milestones Assessment, VB-MAPP Barriers Assessment, VB-MAPP Transition Assessment, VB-MAPP Task Analysis and Skills Tracking, and VB MAPP Placement and IEP Goals. The VB-MAPP is designed to assess learners with a diagnosis of autism or other

developmental disabilities (Sundberg, 2008). The VB-MAPP Milestones Assessment provides a descriptive sample of a learner's verbal and related skills (Barnes et al., 2014; Sundberg, 2008). The assessment includes 170 milestones measuring both language and learning skills across three developmental levels from birth to 4 years of age (Barnes et al., 2014; Sundberg, 2008). Level 1 assesses skills developmentally appropriate for ages 0-18 months, Level 2 18-30 months, and Level 3 30-48 months (Barnes et al., 2014; Sundberg, 2008). The skills assessed throughout the levels include, mand, tact, echoic, intraverbal, listener, responder, motor imitation, independent play, social and social play, visual perceptual and match-to-sample, linguistic structure, group and classroom skills, and early academics (Barnes et al., 2014; Sundberg, 2008).

Verbal operant: Manding. Verbal behavior is broken down into five verbal operants: mand, tact, intraverbal, echoic, and autoclitics (Barnes et al., 2014; Sundberg, 2008). These are verbal operants in that they are all operant behaviors contingent upon the response of a listener (Sundberg, 2008). The mand is the verbal operant Skinner (1957) used to describe when a response (i.e., request) is reinforced by the consequence, which requires functional control of particular conditions of either deprivation or aversive stimuli. The antecedent to the mand behavior is desire for the item requested. Within behavior analysis desire is referred to as the motivating operation (Skinner, 1957). Motivating operations are conditions within the environment that temporarily increase the value of particular reinforcers (Barnes et al., 2014; Sundberg, 2008). An example of a motivating operation is hunger. A person who is hungry is more likely to mand for items that result in getting food (Barnes et al., 2014; Sundberg, 2008). The consequence of the mand is direct reinforcement, ultimately removing the undesired condition (Barnes et al., 2014; Skinner, 1957; Sundberg, 2008). With the example of food, the consequence of receiving the food is the direct

reinforcement as it removes the undesired condition of hunger (Barnes et al., 2014; Skinner, 1957; Sundberg, 2008). Although mands are often correlated to tangible reinforcement, they can also be reinforced by events such as attention (Sundberg, 2008).

Verbal operant: Tacting. Tacting is the verbal operant referring to labeling or naming behavior (Barnes et al., 2014; Skinner, 1957; Sundberg, 2008). This involves an antecedent of a stimulus presenting itself to one's senses followed by a verbal response (Sundberg, 2008). An example would be saying or signing "cookie" when you see, smell, or taste a cookie (Sundberg, 2008). Tacts can also be emitted to refer to actions, features of objects, or feelings (Sundberg, 2008). Contrary to the mand, a tact does not result in the direct, specific reinforcement of what is being labeled; rather, the consequence of the tact is nonspecific reinforcement such as praise, or other forms of social attention (Sundberg, 2008). For example, when one says "cookie," rather than receiving a cookie, the consequence may be "good job—that's right, it is a cookie!" The verbal praise and acknowledgement of accuracy serves as reinforcement as opposed to the item itself (Barnes et al., 2014; Sundberg, 2008).

Verbal operant: Intraverbal. The verbal operant referring to conversational responses and answering questions is an intraverbal (Sundberg, 2008). The antecedent for the behavior is a verbal stimulus (vocal or sign) and the response is also verbal behavior (vocal or sign) (Sundberg, 2008). A specific example would be answering a question such as, "What day is it?" with the response "Monday," rather than repeating the original stimulus of "What day is it?" (Sundberg, 2008). In addition to answering questions, filling in responses, completing phrases, and word associations are also forms of intraverbal behavior (Barnes et al., 2014; Skinner, 1957; Sundberg, 2008). The

consequence to the intraverbal behavior is nonspecific reinforcement (Barnes et al., 2014; Skinner, 1957; Sundberg, 2008).

Verbal operant: Echoic. Echoic behavior is also a verbal operant within the scope of verbal behavior, often referred to as repeating (Skinner, 1957). The antecedent for the echoic is some else's vocal behavior and the response is also vocal (Sundberg, 2008). The vocal response contains the same features of the antecedent. Skinner (1957) referred to echoic behavior as only a vocal response, which does not include sign language. Repeating sign language would be referred to as a motor imitation skill rather than an echoic (Sundberg, 2008). The consequence for echoic behavior is nonspecific in that it does not specify its reinforcement (Barnes et al., 2014; Skinner, 1957; Sundberg, 2008). Within the VB-MAPP echoic skills are assessed within a subtest, Early Echoic Skills Assessment (EESA), developed by Barbara Esch (Sundberg, 2008). The EESA spans over Levels 1 and 2 of the VB-MAPP, assessing the learner's ability to repeat various speech models (Sundberg, 2008). These speech models include phonemes, syllable combinations, and intonation patterns that are developmentally appropriate up to 30 months of age (Sundberg, 2008).

Verbal operant: Autoclitic. Autoclitics are verbal behavior that are dependent upon other verbal behavior but that also modify the function of such (Sundberg, 2008). An example of an autoclitic would be adding the words, "I think" to a statement. Saying, "I think it is snowing" decreases the value of the statement "It is snowing."

Additional milestones of the VB-MAPP. Listener responder, often referred to as receptive directions or following directions, is also a verbal operant; however, the term receptive language does not imply a behavioral response (Sundberg, 2008). The antecedent for listener responding requires someone else's verbal directive or request, but the response is a nonverbal response,

requiring an action rather than vocal talking or sign language (Skinner, 1957). An example of listener responding includes someone saying or signing "sit down" followed by the behavior of one sitting down (Sundberg, 2008). Listener responding also includes touching or looking at a picture or object when it is named, or following simple or multistep directions (Sundberg, 2008). The consequence for listener responding is nonspecific reinforcement, including verbal praise or attention (Sundberg, 2008).

In addition to the five verbal operants, the VB-MAPP assesses 11 additional milestone areas (Sundberg, 2008: motor imitation, textual (reading), transcription (spelling) and copying-a-text, listener responding specific to function, feature and class (LRFCC), visual perceptual skills and matching-to-sample (VP-MTS), independent play, social behavior and social play, spontaneous vocal behavior, classroom routines and group skills, linguistic structure, and math (Sundberg, 2008). Together, all of the milestones assessed by Sundberg were identified and sequenced as areas of development after averaging various developmental expectations from over 50 developmental charts and redefined according to Skinner's analysis of verbal behavior (Sundberg, 2008). The VB-MAPP serves as a measure for assessing skills. This assessment is used in the study to determine skill acquisition of individual students as IEP goals are based on this assessment.

VB-MAPP Barriers Assessment. The VB-MAPP Barriers Assessment measures 24 common language acquisition and learning barriers that often impede a learner's ability to progress through the milestones (Barnes et al., 2014; Sundberg, 2008). The specific barriers assessed include the following: behavior problems, instructional control, defective mands, defective tacts, defective echoic, defective imitation, defective visual perception and matching-to sample, defective listener skills, defective intraverbal, defective social skills, prompt dependency, scrolling, defective

scanning, defective conditional discriminations, failure to generalize, weak motivators, response requirement weakens the motivators, reinforcer dependency, self-stimulation, defective articulation, obsessive-compulsive behavior, hyperactive behavior, failure to make eye contact, and sensory defensiveness (Barnes et al., 2014; Sundberg, 2008). Through accurately identifying a learner's barriers, specific behavior intervention protocols can be implemented in order to reduce or eliminate such behaviors, and ultimately result in more effective learning and a higher rate of skill acquisition (Barnes et al., 2014; Sundberg, 2008).

VB-MAPP Transition Assessment. The third component, the VB-MAPP Transition Assessment, includes 18 assessment areas designed to identify whether a learner is making meaningful progress, as well as whether or not the learner has acquired the necessary skills to learn in the least restrictive environment (Barnes et al., 2014; Sundberg, 2008). The assessment includes several summary measures from the Milestones Assessment as well as other skill areas that may affect transition (Barnes et al., 2014; Sundberg, 2008). The VB-MAPP Transition Assessment includes comprehensive measures from the Milestones Assessment, Barriers Assessment, negative behaviors, classroom routines and group skills, social skill, academic independence, generalization, variation of reinforcers, rate of skill acquisition, retention, natural environment learning, transfer skills, adaptability to change, spontaneity, independent play, general self-help, toileting, and eating skills (Barnes et al., 2014; Sundberg, 2008, p. 2).

VB-MAPP Task Analysis and Skills Tracking. The fourth component to the comprehensive VB-MAPP Assessment is the VB-MAPP Task Analysis and Skills Tracking, which is designed to serve as a curriculum guide through the further analysis of learning and language skills (Barnes et al., 2014; Sundberg, 2008). This component includes approximately 900 skills

across 16 areas of the VB-MAPP to be completed after the Milestones Assessment (Sundberg, 2008). These areas are not significant enough to be marked as a milestone but are identified as critical skills in developing a learner's overall skill repertoire closer to that of a neuro-typical child (Barnes et al., 2014; Sundberg, 2008).

VB-MAPP placement and IEP goals. The fifth and final component to the VB-MAPP is the VB-MAPP placement and IEP goals. This component relates to the four assessments described and provides detailed recommendations for each of the 170 milestones, including specific IEP goals to support them (Sundberg, 2008). The overall placement recommendations also provide guidance in program development for the learner, as it identifies all necessary aspects of the intervention that are included within the program (Sundberg, 2008).

Functional Behavior Assessments

Within the field of ABA, functional behavior assessments (FBAs) are used to assess problem behavior (Rooker et al., 2015). This assessment is a process in which clinicians attempt to determine which variables increase and maintain the likelihood of an identified target behavior (Rooker et al., 2015). The FBA process can include several different procedures dependent on the individual case, some of which include, indirect (anecdotal) assessments, descriptive (naturalistic) assessments, and functional (experimental) analyses (Beavers & Iwata, 2014). Indirect assessments rely heavily on the recall of another person such as a parent or teacher, as information is often attained through interview (Rooker et al., 2015). Descriptive assessments include observation of the problem behavior with specific notation of what happened directly before and after the behavior, as well as data regarding frequency, duration, and intensity of problem behavior (Rooker et al., 2015). Functional analyses include the systematic manipulation of an environment to

determine exactly which variables the behavior occurs under, ultimately identifying the function, or purpose of the behavior (Beavers & Iwata, 2014). In many FBAs, both indirect and descriptive assessments are used in combination to identify the function of the behavior and design a behavior intervention program based on the function (Beavers & Iwata, 2014; Rooker et al., 2015). In the proposed study, these behavior intervention programs will be assessed for treatment integrity within the study to examine the effects of such on overall skill acquisition of the learner.

Indirect assessments. Indirect assessments as part of the FBA process include the following key components: evaluating the circumstances in which the behavior occurs, relying on informant recollection of behavior, and including verbal reports such as interviews, checklists, and rating scales (Beavers & Iwata, 2014). Evaluators for several reasons often prefer indirect assessment components of the FBA:

1. The assessments do not put the individual or evaluator in direct risk because they do not require direct observation of the problem behavior (Beavers & Iwata, 2014).
2. Indirect assessments do not require an extensive skill set on the evaluator's part (Beavers & Iwata, 2014).
3. Indirect assessment procedures are a preferred method because they are not time consuming for the evaluator, as they often require as little as 30 minutes to complete (Beavers & Iwata, 2014).

Although indirect assessments have gained preference from many evaluators, research has revealed that anecdotal assessments demonstrate poor reliability and questionable validity (Rooker et al., 2015).

Descriptive assessments. Because of that poor reliability and validity, best practices of ABA include additional assessments such as descriptive methods when an FBA is completed (Rooker et al., 2015). Descriptive assessments include the direct observation of an identified problem behavior under the natural conditions in which the behavior typically occurs (Beavers & Iwata, 2014). Descriptive assessments allow for better quantification of behavior and environmental variables, although they often fail to accurately identify the reinforcers maintaining the problem behavior (Beavers & Iwata, 2014). Ultimately, descriptive assessment procedures are not able to determine functional relations but only demonstrate correlations between environments and behavior (Beavers & Iwata, 2014). If an evaluator wishes to determine the functional relation, a functional analysis must be completed.

Functional analyses (FAs) are the only type of functional behavior assessments that determine a functional relation (Beavers & Iwata, 2014). Functional analyses involve experimental methods to determine the cause-and-effect relationship between the identified problem behavior and environmental variables (Beavers & Iwata, 2014). This involves testing possible functions: escape, attention, sensory stimulation, and pain attenuation (Rooker et al., 2015). When completing functional analyses, the evaluator faces several challenges including: time constraints, severe problem behavior, low-rate problem behavior, and setting or evaluator influences (Beavers & Iwata, 2014). An FA typically requires several hours over the course of several days to complete (Beavers & Iwata, 2014). Depending on the severity of the problem behavior, such as self-injurious behavior or aggression, the response rate required to assess the behavior under various conditions can be problematic through the potential harm to the individual (Beavers & Iwata, 2014). For behavior that occurs less frequently it is difficult to assess such throughout a functional analysis assessment

(Beavers & Iwata, 2014). Establishing operations of deprivation from attention, or the lack of task demands, does not always elicit problem behavior immediately, therefore not evoking the targeted problem behavior within the contrived interval of an identified testing condition (Beavers & Iwata, 2014). Lastly, setting or evaluator influences can pose a challenge. Most often FAs are conducted in controlled settings by highly trained, new assessors as opposed to staff or caregivers, which raises questions about the authenticity of the natural environment in which the behaviors are reportedly observed (Beavers & Iwata, 2014). For these reasons, evaluators must take several steps to organize their assessment prior to beginning a functional analysis (Rooker et al., 2015).

Additional tools used for a functional behavior assessment. Prior to the functional analysis testing conditions of a functional behavior assessment, evaluators will often gather information about the individual and the targeted problem behavior through indirect methods such as interviews and questionnaires (Iwata, DeLeon, & Roscoe, 2013). The Functional Analysis Screening Tool (FAST) is a questionnaire consisting of 16 items targeting antecedent and consequent events that may demonstrate a correlation to the targeted problem behavior (Iwata et al., 2013). The 16 items are categorized to identify the correlation of the four functions: attention, escape, sensory stimulation, and pain attenuation (Iwata et al., 2013). The overall reliability of the FAST itself has yielded scores of 71.5% in predicting the condition of the functional analysis for the highest rate of the targeted problem behavior (Iwata et al., 2013). While 71.5% does not meet the 80% criterion most often considered acceptable for direct observations, it yields the highest reliability rate for FBA screening measures (Iwata et al., 2013). Alternative assessments that also provide behavioral correlations through indirect measures of informant recall include the Motivation Assessment Scale (MAS) and Questions About Behavioral Function (QABF; Iwata et

al., 2013). Although both these assessments evaluate possible functions based on informant questionnaires, they do not assess the social contingencies involved in the delivery or reinforcement, or the lack of attention delivered (Iwata et al., 2013). Additionally, neither the MAS nor QABF assess the automatic-negative reinforcement category of behavior as a function (e.g., scratching an itch) as the FAST does (Iwata et al., 2013).

Interventions based on function. As part of the functional behavior assessment (FBA) process, interventions are identified based on function (DeFazio et al., 2011). Utilizing a functional approach to behavior intervention programming can be effective in the decrease of problem behaviors, while simultaneously promoting appropriate replacement behaviors (Lane, Bocian, McMillan, & Gresham, 2004; Liaupsin, 2015). A function-based intervention includes antecedent and consequent strategies as a result of the functional behavior assessment (Liaupsin, 2015). Through the functional behavior assessment and subsequent interventions, a clear description of the conditions that evoke an identified problem behavior can be manipulated to create conditions that elicit replacement behavior and prevent the recurrence of the targeted problem behavior (Liaupsin, 2015).

Contrary to the demonstrated effectiveness and apparent logic of a functional approach, interventions based on function can fail (Liaupsin, 2015). The interventions might not use accurate assessment results, or the intervention plan might not be implemented with fidelity (Lane et al., 2004; Liaupsin, 2015). To avoid such obstacles, team members must be trained on the interventions to be implemented and in ongoing fidelity checks regarding the accuracy of the implementation (DeFazio, 2011; Lane et al., 2004). However, behavior analysts are not always afforded the opportunity to ongoing access for such consultation, and they must rely on the data

(DeFazio, 2011). The difficulty in relying solely on the data is that, in doing so, one is assuming the data were taken accurately; another key to fidelity checks (DeFazio, 2011).

Decreasing problem behavior is not just important for the reason of minimizing disruption (Jones, Wickstrom, & Friman, 1997). When problem behaviors are decreased, the instructional time available to the individual learner increases. Learners are then afforded the opportunity for a higher rate of skill acquisition (Jones et al., 1997). Increased instructional time is one of the key reasons why research in treatment integrity of behavior interventions is necessary (Jones et al., 1997). Eliminating the inaccuracies of intervention implementation allows learners to focus on other areas of skill acquisition and ultimately provide them with more skills to increase their level of independence in the future due to the reduction of interfering problem behavior (Jones et al., 1997).

Treatment integrity. Behavior plans, both formal and informal, have become the norm within education (McIntyre, Gresham, DiGennaro, & Reed, 2007). Individualized plans based on identified target behaviors are often designed and implemented within various educational settings; however, the fidelity of the behavior plan being implemented is often in question (McIntyre et al., 2007). Accurate implementation is critical in the continued programming of any intervention for several reasons. Without proper implementation of a designed intervention, not only is the effectiveness of the intervention uncertain, but also depending on the behavior and intervention in place, the behavior being targeted could in fact worsen (McIntyre et al., 2007).

Studies have been conducted to assess the integrity of various behavior interventions. Within these studies the terms treatment integrity and treatment fidelity are often times used interchangeably (McIntyre et al., 2007; Witt et al., 1997). Additionally, the terms *procedural*

integrity or *procedure fidelity* are also used. In this study the term *treatment integrity* is used for simplicity. Treatment integrity refers to the precise extent in which the independent variable is implemented as procedures are written. According to Cooper, Heron, and Heward (2007), *treatment integrity* refers to the agreement measured on the exact occurrence or lack of occurrence of the identified independent variable.

Treatment integrity is a broad topic and the assessment of such must be individualized to the intervention being evaluated. Treatment integrity refers to the close monitoring of accurate implementation of behavior interventions by staff (Bruce et al., 2001). Bruce et al. (2001) further highlighted how therapists are trained in the procedures of functional analysis to increase the integrity of behavioral interventions. Additionally, Witt et al. (1997) investigated the procedures to increase treatment integrity of schoolteachers through comparison of strategies to maintain overall fidelity.

Effects of treatment integrity. Treatment integrity has been directly correlated to students' academic and behavioral outcomes (Arkoosh et al., 2007; Collier-Meek et al., 2017; Greenwood et al., 1992; Grow et al., 2009; Holcombe, Wolery, & Snyder, 1994; McEvoy, Shores, Wehby, Johnson, & Fox, 1990; Wood, Umbreit, Liaupsin, & Gresham, 2007). When interventions are effectively implemented, treatment integrity ensures that the treatment plan is implemented consistently and accurately (Lane et al., 2004). Without accurate and consistent implementation of treatment interventions, student achievement can be affected.

Treatment integrity also supports the evaluation of the intervention. It would be difficult, if not impossible, to assess the intervention without treatment integrity, as it would not be possible to attribute identifiable student outcomes to specific interventions if there is no evidence of the said

intervention being implemented accurately to its design (Duchnowski, Kutash, Sheffield, & Vaugh, 2006). Researchers found evidence-based interventions are not implemented with consistency in special education classrooms (Duchnowski et al., 2006; Greenwood & Abbott, 2001; Landrum, Tankersley, & Kauffman, 2003; Owens, Holdaway, & Smith, 2017; Wadsworth, Hansen, & Willis, 2014). Furthermore, when providing intervention to students in special education, time is critical as students are most often already behind their typical peers, and therefore the use of treatment integrity when implementing interventions is paramount (Lane, 2007; Palmar & Cawley, 1998).

Treatment integrity reliability. Treatment integrity research has not identified a set percentage of acceptable integrity in terms of inter-observer agreement (Noell et al., 2002; Smith et al., 2007); however, the level of treatment integrity should be directly correlated to the level of change needed for the target student to be successful (Gresham, 2005). Therefore, if there is a high importance for a change in target behavior, such as that for self-injury, the treatment integrity rate should be significantly higher than that of a less severe behavior. Additional research by Wilder, Atwell, and Wine (2006) yielded results relating to a three-step prompting procedure. According to the authors, one hundred percent integrity lead to 80% –100% student compliance, compared to 50% integrity leading to 40% – 50% student compliance. Ensuring academic and behavioral interventions are implemented as designed is critical because it is directly linked to student outcomes.

Within the field of behavior analysis, interventions are assessed for effectiveness based on student performance data that allows for close monitoring and adjustments to interventions (DeFazio, 2011). The use of data avoids decisions made inappropriately in regard to both behavior and academic planning while demonstrating the effectiveness based on the usability and utility of

interventions, in addition to the necessary components to increase the effectiveness of the overall outcome (DeFazio, 2011, p. 48). These data are used to determine not only the effectiveness of an intervention but also whether the intervention should be continued, modified, intensified, or eliminated (Gresham, 2004).

Treatment integrity methods. Various methods have been used to evaluate behavioral interventions (Wilczynski, Mandal, & Fuslier, 2000). Systematic observation is a direct approach to assessing treatment integrity, although such a procedure is highly susceptible to reactivity effects and can be laborious in school settings (Wilczynski et al., 2000). However, several methods are used to less directly monitor the integrity of behavior interventions (Wilczynski et al., 2000). These methods include self-reporting, permanent products, interviews, and performance feedback (Wilczynski et al., 2000). Empirical research supports a combination of treatment monitoring and performance feedback to increase the integrity of treatment implementation with a direct result of improving student behavior performance (McIntyre et al., 2007a, 2007b). Overall, expanding the traditional behavior consultation model of treatment integrity to incorporate a structured treatment-monitoring portion, instead of informal contacts, may be an effective approach to increasing the integrity of the intervention through performance feedback (McIntyre et al., 2007).

With this approach to performance feedback, using treatment monitoring interviews to deliver the feedback has proven highly effective (Wilczynski et al., 2000). That approach includes reviewing progress, identifying barriers to implementing the plan, and identifying modifications needed (Wilczynski et al., 2000). In the follow-up performance feedback session, the evaluator then analyzes the integrity data, reinforces accurately implemented components, and provides corrective feedback where necessary. A plan is then developed for follow-up training and support,

and evaluator and implementing staff reaffirm the commitment to the plan implementation (McIntyre et al., 2007).

Treatment integrity data. Previous research has shown that reporting rates of treatment integrity data are remarkably low yet stable since 1991 (Carroll et al., 2013; Haggermoser-Sanetti, Collier-Meek, Long, Kim, & Kratochwill, 2014; McIntyre et al., 2007). Why treatment integrity reporting rates are low is unclear, although it could be that the editing process limits space, or lack of skills or resources (McIntyre et al., 2007). Additionally, there could be a publication bias in searching those studies reporting high rates of integrity, or researcher views of treatment integrity not demonstrating importance (McIntyre et al., 2007). In any case, treatment integrity data for implementing behavioral interventions are necessary for continued programming (Wilczynski et al., 2000).

Determining the accuracy of treatment protocols allows the behavior analyst to evaluate the procedure and make modifications as necessary (Wilczynski et al., 2000). For example, if the protocol is implemented accurately without the desired effects, the protocol may be modified or additional training may be warranted (Wilczynski et al., 2000). Another possibility is that the intervention is not implemented with integrity yet the desired effects are still occurring (McIntyre et al., 2007). In this case the behavior analyst would need to modify the protocol to illustrate the currently implemented intervention (McIntyre et al., 2007). Ultimately, ongoing treatment integrity assessments are necessary to provide sufficient treatment protocol decisions (Wilczynski et al., 2000).

Skill acquisition. Skill acquisition refers to the rate at which a learner is able to master new skills; however, there is no standard definition associated with the term (Weiss, 1999). In order to

assess the skill acquisition, formal assessment is completed by a rater considered an expert in the field, such as a therapist or clinician. An assessor uses a checklist or rating skill to determine the acquirement of the skill; however, skill acquisition is not determined based on participant reports (Weiss, 1999). Lindhiem, Higa, Trentacosta, Herschell, and Kolko (2014) reviewed 85 empirical research articles published between 2000 and 2012 to measure the acquisition and utilization of skills within evidence-based treatments for identified behavior problems. In the review of the literature, no identified standardized measures of skill acquisition were used across treatment (Lindhiem et al., 2014). Furthermore, it was difficult to determine predictors or outcomes for how skill acquisition is associated to specific skills. Few researchers have analyzed the systematic approach and techniques necessary to increase the overall acquisition of skills (Lindhiem et al., 2014).

Review of studies. Overall, Lindhiem et al. (2014) found that 87% of articles they reviewed included skill acquisition. Although several measures were used, observational reports were used 81% of the time. The remaining 18.9% included clinician reports (4.1%), self-reports (1.4%), and test/performance assessments (16.2%). Of these 85 articles, the skill acquisition was measured using observation (29.2%), clinician report (4.2%), self-report (20.8%), parent report (4.2%), test of knowledge/performance (4.2%), and homework (41.7%) (Lindhiem et al., 2014).

The methods and procedures of assessment in regard to the skill acquisition varied greatly in terms of frequency, duration, and sampling of assessments (Lindhiem et al., 2014). More specifically, although many researchers used observation periods as a means of measuring skill acquisition, those time periods ranged greatly from 5 to 75 minutes. The observation frequency ranged during pretreatment from once or twice to every session during post treatment. Of the 85

articles, only 13 examined the antecedents and predictors of skill acquisition, while 21 articles examined the outcomes associated with skill acquisition, more specifically improvement rates in the individual's problem behavior). Enhancing skill acquisition was studied in 11 articles within the study (Lindhiem et al., 2014).

Critical Review of Research Methods

Collecting specific treatment integrity data can be accomplished throughout several methods. Three of the most common methods include: self-report, permanent product, and direct observation with performance feedback (Gresham, MacMillan, Beebe-Frankenber, & Bocian, 2000). Self-report data integrity is most often utilized due to the simplicity of the implementation and does not require additional persons as data collectors resulting in a more cost effective approach (Carroll et al., 2013; Gresham et al., 1993a; Parsons et al., 2012; Wadsworth et al., 2014). This method of treatment integrity involves having teachers or other treatment implementing staff complete surveys or rating scales as an evaluation of their own performance in the implementation (Gresham et al., 1993a). A self-monitoring approach to treatment implementation as a means of integrity checks often yields inflated estimates of treatment integrity and is therefore not recommended to be used as the only approach to assessing treatment integrity (Gresham et al., 1993a; Wickstrom, Jones, LaFleur, & Witt, 1998).

Another method of treatment integrity is the use of permanent product review; Wilkinson (2007) notes the increased accuracy of such a method. Permanent product review used as a means of assessment for treatment integrity includes reviewing student work samples and/or point sheets to allow the evaluator to assess the accuracy of the intervention implementation. For example, at the end of the day or week teachers can review student point sheets to determine whether those

responsible for implementing the treatment intervention did in fact record the points at the identified times of day as outlined in the plan. An advantage to the use of permanent product data collection as a tool for assessing treatment integrity is that it does not require much additional work for those implementing the plan, nor does it require additional staff for observation, data collection or review (Lanre, Bocian, MacMillan, & Gresham, 2004). This type of treatment integrity is most appropriate for treatment plans that utilize a token economy or point sheet that can be reviewed at specified intervals, but less appropriate for those plans that involve intangible reinforcement such as praise or multi-step procedures relating to prompting (DeFazio et al., 2011).

Another method used in the evaluation of treatment integrity is direct observation in combination with performance feedback (Codding, Feinberg, Dunn, & Pace, 2005; Codding et al., 2008). This methodology involves an observer trained in the intervention to observe the staff member implementing the intervention and collect real-time data regarding the accuracy in which the staff member performs each step (DeFazio et al., 2011). The method of treatment integrity has yielded results of effectiveness for raising treatment integrity from levels as low as 9% – 37% to acceptable or near acceptable rates of 60% – 83% (Carroll et al., 2013; Jones, Wickstom, & Friman, 1997; Parsons et al., 2012; Wadsworth et al., 2014). Another advantage to the use of direct observation with performance feedback is that "the teacher is provided with specific information about which components of an intervention are being implemented correctly and which components may require additional work or training (DeFazio et al., 2011). According to research by DiGennaro, Martens, and Kleinmann (2007), performance feedback provided to the implementing staff member regarding a specific intervention can be more powerful in behavior change than simply reporting back to the teacher how a student is responding to said intervention. In order to

collect treatment integrity data through direct observation, proactive planning is required. A checklist of the procedure to be used must be developed for the evaluating staff member to collect the real time data.

Each of these methods discussed are used in a program evaluation or data collection methods. They either focus qualitatively on information that is not presented in numerical form, or quantitatively in the form of descriptive data that can be difficult to analyze at times. There is minimal research in this area that has been completed using an Action Research Method model. Utilizing such a method allows for components of both qualitative and quantitative measures to be incorporated through a community of research to address the current concerns of fidelity of interventions and the effects of overall skill acquisition.

Synthesis of Research Findings

In synthesis of the research findings, the population and diverse learner needs in the public school setting are drastically changing with the laws surrounding the least restrictive environment. With these changes comes a significantly increased need for behavior intervention recommendations. However, it is these same behavioral interventions recommended in various environments that lack the integrity in the implementation of said interventions. Interventions are not being implemented as designed in order to treat the function of behavior (DeFazio et al., 2011). For this reason, when behavioral interventions are recommended to a given team/program, integrity checks must be part of this recommendation in order to ensure integrity of the intervention, thus increase skill acquisition. Without the presence of 3rd party support staff/evaluators, there is not accountability for behavioral recommendations and therefore implementation is not performed as intended.

Critique of Previous Research

A review of the literature has indicated that treatment integrity is a complex construct. Students with various needs are present in our schools every day. With the more recent push for inclusion we are finding more students with increased behavioral needs in our schools. This increase in behavioral needs has subsequently resulted in a need for more behavioral supports and recommendations to be implemented across educational environments (Jones et al., 1997). These supports and recommendations are often times designed and discussed within meetings or trainings, but little to no follow up on the fidelity of the recommendations are provided (Haggermoser-Sanetti et al., 2014).

With school aged education moving towards the inclusive model and the need of behavioral supports and interventions within the general education population increasing, it is critical to examine the knowledge and resources of the general education staff (Coles, Owens, Serrano, Slavec, & Evans, 2015). An accurate understanding of staff knowledge will not only allow this researcher to determine the baseline of understanding for learner-specific follow-up training, but also provide insight as to the understanding of applied behavior analysis principles so the need for additional supports to implement said interventions can be evaluated.

Chapter Summary

The literature reviewed within this chapter highlights the science of applied behavior analysis. It further emphasizes the standard assessment of the VB-MAPP used within the field in order to identify individual student functioning levels, as well as impeding variables to an individual's learner profile. This literature further illustrates overall educational and behavioral programming for students. Additionally, the research details the use of the need of functional

behavior assessments, and how such relates to an individual student's learner profile and programming.

In addition to the review of the behavioral science and standard assessments utilized within the field, both treatment integrity and skill acquisition were researched as well. The research of the assessments is critical in understanding the individual levels of students, as well as assist in the development of the intervention protocol, and the research of treatment integrity reviews the current literature on the effectiveness of intervention protocol implementation. This ultimately ties in with the research of skill acquisition in that the fidelity of intervention implementation affects the overall skill acquisition of students.

Chapter 3: Methodology

This chapter discusses in detail the action research method approach used, the sampling method, the site of the research, and the steps followed to implement the study. Action research is a systemic approach to identifying a solution to a problem faced in everyday life (Stringer, 2007). I analyzed behavioral interventions using individualized fidelity checks designed per behavioral protocols. I analyzed the accuracy of behavior protocol implementation with overall skill acquisition of students and staff competency. Staff competency refers to staff members' physical ability to perform or move efficiently throughout the room to implement individual behavior protocols. This fidelity check is not reflective of their overall job performance as outlined in their job description.

This action research was used to examine the experiences of the teachers and staff in implementing behavioral protocols with increased fidelity checks. Additionally, the effects of increased fidelity checks on problem behavior and skill acquisition were examined. The results of this study assisted in identifying professional development needs for professionals and the support staff working with students exhibiting problem behavior.

Research Questions

The main research question examined was: What are the experiences of professional and support staff at a suburban Philadelphia school district regarding the increased frequency of fidelity checks for behavior protocols?

Three subquestions follow:

1. What is the relationship between frequency of fidelity checks of behavior protocols and accuracy of intervention implementation?

2. What is the relationship between frequency of fidelity checks of behavior protocols and problem behavior?
3. What is the relationship between frequency of fidelity checks of behavior protocols and skill acquisition?

Purpose of the Study

The purpose of this action research study was to better understand the experiences of professional and support staff at a suburban Philadelphia school district regarding the effectiveness of increased frequency of fidelity checks for behavior protocols. I employed a partnership model in which I worked as an evaluator with school staff, including administrators, teachers, paraprofessionals, and ancillary service providers. This level of collaboration was necessary because of the inherent complexities of treatment integrity and the legal implications resultant of noncompliance with such integrity. Such legal implications are consequent to the inaccuracy in Individual Education Program (IEP) implementation, the cost of which varies because of process hearings and compensatory education settlements at the district's expense following inaccurate behavior protocol implementation. Monitoring behavior protocols with fidelity checks would limit this.

Research Population and Sampling Method

Site Description

The classroom is located in one of 13 elementary buildings within a large suburban Philadelphia school district located approximately 20 miles north of the city. The district covers approximately 42 square miles and is ranked in the top 5% of Pennsylvania school districts, according to the Pennsylvania System of School Assessment (NPSD, 2015-2016, p. 1). In addition

to the 13 elementary schools, the district comprises three middle schools, one high school, and one alternative education school, attended by a total of 13,000 students (NPSD, 2015-2016, p. 6). The specific elementary building in which the study took place educates 565 students in kindergarten through Grade 6 (NPSD, 2015-2016, p. 6). The two-story building has classrooms, intervention rooms, and large open spaces throughout each floor. The school offers many resources, including Title I, reading support, math support, special education learning support, special education autism support, special education emotional support, vision support, hearing support, behavior support, occupational therapy, physical therapy, and speech and language therapy.

Research Population

The population of this study included professional and support staff servicing the autism support program within the target classroom of this study. This included the special education teacher, a speech and language pathologist, occupational therapist, and paraprofessionals servicing the classroom.

Sampling Method

A purposeful sample of 6 to 10 participants was studied, targeting the specific staff working in the autism support classroom. Participants were recruited based on where they work and the role they played in the implementation of specific students' behavior intervention plans. All participation was voluntary. This number of staff was chosen because it was the total number of staff that worked within the classroom where the study took place.

Instrumentation

Collecting specific treatment integrity data can be accomplished through self-reports and direct observation with performance feedback. Both methods were used, along with interviews.

Self-reports. Self-report data was utilized because of the simplicity and cost-effectiveness of the implementation. No additional persons were needed to serve as data collectors. This method of treatment integrity involves having teachers or other treatment implementing staff complete surveys or rating scales as an evaluation of their own performance in the implementation (Gresham, 2005). A self-monitoring approach to treatment implementation as a means of integrity checks often yields inflated estimates of treatment integrity and is therefore not recommended as the only approach to assessing treatment integrity (Gresham, 2005; Wickstrom et al., 1998).

Direct observations. Another method used to evaluate treatment integrity was direct observation in combination with performance feedback (Codding et al., 2005, 2008). This methodology involves an observer trained in the intervention to watch the staff member implementing the intervention and collect real-time data regarding the accuracy with which the staff member performs each step (DeFazio et al., 2011). This method of treatment integrity has yielded results of effectiveness for raising treatment integrity from levels as low as 9% – 37% to acceptable or near acceptable rates of 60% – 83% (Jones et al., 1997). Another advantage of direct observation with performance feedback is that "the teacher is provided with specific information about which components of an intervention are being implemented correctly and which components may require additional work or training" (DeFazio et al., 2011, p. 46). DiGennaro et al. (2007) found that performance feedback provided to the implementing staff member regarding a specific intervention can be more powerful in behavior change than simply reporting back to the teacher how a student is responding to the intervention. Collecting treatment integrity data through direct observation requires proactive planning. A checklist of the procedure used was developed for the evaluating staff member to collect the real-time data (see Appendices D & G).

Data Collection

Self-reports. During the study, participants completed data collection forms (see Appendices D & G) of the specific behavior protocol implemented. Data collection forms are completed throughout the entire 6.5-hour school day for those staff working on the implementation of specific behavior protocols. These data collection forms detail the probes taken of each occurrence for when the specified behavior protocol was implemented throughout the school day. Staff members maintained clipboards with the data collection forms recording each probe throughout the day.

Direct observations. Through direct observation I performed fidelity checks in the form of a task analysis, detailing, step by step on each aspect of every behavior intervention plan being assessed (see Appendices C & F). This fidelity check included an inter-observer agreement component as well. This was achieved through the comparison of staff data with that of the principal investigator. This step was critical in assessing the overall validity of the intervention because the data collected by the staff ultimately are reported and analyzed to determine the effectiveness of the intervention.

Additionally, self-report was used through the interview process at the close of the study. This interview included questions regarding training, on-site support, perception of knowledge, and preference of job assignments (see Appendix A), all important to assessing staff investment in the intervention.

Participants were chosen at random for the frequency of fidelity check observations. Fidelity checks were completed per participant at the following intervals:

Mary: two times per week

Jinny: one time per week

Leslie: every 2 weeks

Abby: one time per month

Sam: two times per week

Jackie: every 2 weeks

Karen: two times per month

Each participant was trained by the teacher/researcher on both the "Wait" and "Accepting No" protocol in order to support the various student needs within the classroom. Observational periods to complete fidelity checks were set for 1-hour intervals. If the protocol was implemented before 1 hour, the observation period ended. If the protocol was not observed during the 1-hour period, the observation period ended, and no data was recorded. Immediately following the protocol implementation, results of the fidelity check were shared with the implementing staff when possible. Whenever appropriate, direct modeling and training in the moment occurred. If immediate review of the protocol was not possible, a review of the fidelity check between the principle investigator and implementing staff, with direct feedback, was provided within one school day.

Identification of Attributes

Several attributes of the study include applied behavior analysis (ABA), treatment integrity, and staff training. Applied behavior analysis is "the process of systematically applying interventions based upon the principles of learning theory to improve socially significant behaviors to a meaningful degree, and to demonstrate that the interventions employed are responsible for the improvement in behavior" (Cooper et al., 2007, p. 7). This study was based on the science of ABA,

specifically by using treatment integrity methods to implement fidelity checks of behavioral protocols. It is through the implementation of these fidelity checks that treatment integrity of behavior protocols was examined. Treatment integrity within this study refers to the close monitoring of accurate implementation of behavior interventions by staff (Bruce et al., 2001). The staff implementing the behavior protocols required specific training for each protocol being utilized.

Data Analysis Procedures

Within this action research study, both frequency and descriptive measure were used. Frequency measures such as the fidelity checks and descriptive measures such as participant feedback and interviews were utilized to answer the research questions. A constant comparative method approach guided the analysis of interview data. The frequency data relating to the fidelity checks drove the performance feedback provided.

Action research approach. The research questions were answered within this action research study using Stringer's (2007) *Look, Think, Act* model (see Figure 1). The model consists of three stages that continuously cycle through each stage, so participants can commence their inquiries in a direct and straightforward manner in which the details of the process and the specifics of the issues emerge throughout the study (Stringer, 2007). The *look* stage, focusing on gathering these data, was accomplished in this study through both the fidelity checks and the interview forms of data collection. Within the *look* stage, the data collected was then used to build the picture of the problem being examined. In this study, the issue being examined was the fidelity of behavior intervention implementation. The *think* stage, focusing on analyzing these data, used the fidelity checks and participant feedback during such to drive the *act* stage. Two direct actions occurred

during this study: The implementation of biweekly meetings and the development of Google Drive folders resulted from of the fidelity checks and participant feedback. Additionally, interviews occurred at the close of the study to culminate the action research and provide insight to the overall experiences of participants throughout the study. How data were used to answer each research question is detailed.

Summarizing interviews. Data analysis procedures began with the staff interviews (see Appendix A). Taking a deductive approach, I conducted and audio-recorded individual interviews with the seven staff participants in the purposeful sample. The transcription embraced a thematic analysis and focused on commonalities, differences, and relationships among interviewee responses (Harding, 2013). The first step in achieving this was to summarize each interview by reducing the content to the key points to identify similarities and differences among participants (Harding, 2013). Key themes were identified for each interview question.

Constant comparative method of interviews. The constant comparative method assists in identifying both similarities and differences within a data set. The constant comparative method originated in the grounded theory approach by Glaser and Strauss, but it has been argued that is the crux of all qualitative data analysis to rely on comparing and contrasting (Harding, 2013). In addition to interview summarizing, the three-step constant comparative method was used in analyzing interview transcriptions: (a) listing similarities and differences in responses, (b) amending the list as cases were added, and (c) identifying relationships upon completing the analysis (Harding, 2013). Relationships were determined based on patterns of identified similarities and differences based on the bulleted key points identified by summarizing the similarities and differences.

Interview organization. Each interview transcription includes the interviewee's name, date, time, typed transcription, and bulleted summary (see Appendix A). A comparative grid comparing, contrasting, and highlighting relationships between all responders appears on a separate document. The interviews were used to answer the main research question: What are the experiences of professional and support staff at a suburban Philadelphia school district regarding the increased frequency of fidelity checks for behavior protocols? Additionally, during the interviews, review of student progress towards IEP goals was discussed and Subquestions 2 and 3 were answered as well: What is the relationship between frequency of fidelity checks of behavior protocols and problem behavior? And, What is the relationship between frequency of fidelity checks of behavior protocols and skill acquisition?

Fidelity Checks

Typological analysis of fidelity checks. Typological analysis will be completed on the "Wait" and "Accepting No" fidelity checks (see Appendices C & F). Typological analysis involves data analysis that "starts by dividing the overall data set into categories or groups based on predetermined typologies" (Hatch, 2002, p. 152). The typologies were analyzed by two categories: were the total mean score and per step analysis of each fidelity check. Completed fidelity checks were analyzed according to total percentage of correct steps to identify the total mean score (Creswell, 2013). All completed fidelity checks were also analyzed in terms of implementation accuracy for each step of the protocol. For example, each of the 10 "Wait" fidelity check steps were analyzed to identify the accuracy of all participants in regard to the implementation of individual steps and for a further analysis of the implementation (see Appendix C). This same analysis was completed for the 11-step "Accepting No" fidelity check (see Appendix F). Patterns,

relationships, and themes were identified within typologies based on the mean score averages and step-by-step implementation accuracy (Hatch, 2003). Relationships identified across fidelity checks per the mean score and step-by-step analysis were summarized as one-sentence generalizations (Hatch, 2003). The fidelity check data were used to answer Subquestion 1: What is the relationship between frequency of fidelity checks of behavior protocols and accuracy of intervention implementation?

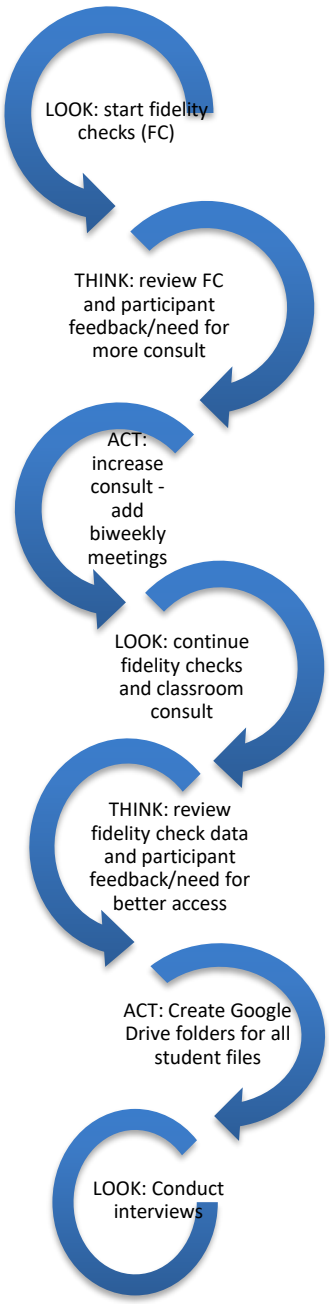


Figure 2. Cycle of research questions and themes as addressed in the *Look*, *Think*, *Act* model.

Limitations and Delimitations of the Research Design

Limitations

Limitations included both the purposeful sampling of the study, as well as the observation periods in which the fidelity checks were completed. The purposeful sample was identified by access and location of participants. Participants were recruited based on their assignment of working with students with specific behavior protocols identified within their individual education plans (IEPs). The staff working with students with either an "Accepting No" or "Wait" protocol in their IEP were invited to participate in the study with the option to discontinue at any point. Because of the use of purposeful sampling, the results of the study did not conclude a general application to a larger population but only suggest such; however a larger sampling would support transferability of the conclusions (Simon, 2011).

The time limited observation periods during the fidelity checks were an additional limitation (Simon, 2011). The 1-hour periods could pass without documented observation of the implemented protocol. Given the need of an identified end time for the observation period, fidelity checks could not logistically be completed throughout an entire school day for the length of this study.

Delimitations

"Delimitations are those characteristics that limit the scope and define the boundaries of your study" (Simon, 2011, p. 2). Objectives, research questions, population samples and other variables are all delimiting factors (Simon, 2011). One delimitation was identifying the problem, as there were many related problems that could have been identified but were rejected (Simon, 2011).

Another delimitation was the identification of two behavior protocols that were monitored for fidelity, and the effects of the fidelity of those protocols. Two protocols were identified to

increase the number of opportunities fidelity checks could be monitored. If only one protocol was examined, fewer opportunities would be observed through less available data points.

A third delimitation was the population (Simon, 2011). The study took place with participants who primarily support students within the autism support program in a suburban Philadelphia school district. The results are transferable to other special education programs supporting the needs of students with similar intervention protocols, such as the "Accepting No" and "Wait" protocols to be examined for fidelity in this study.

Validation

Interpreting the term *validity* can be subjective. Jupp's (2006) definition is apropos to this study: "the extent to which conclusions drawn from research provide an accurate description of what happened or a correct explanation of what happens and why" (p. 311). In sum, validation is the trustworthiness of the results (Creswell, 2013). To ensure the validity of the data that I analyzed, several measures were taken. The credibility and dependability of both the interviews and fidelity checks were specifically monitored both throughout the data collection gathering stage, as well as during these data analysis procedures. The validity of these data was assessed through a triangulation of measures including member checking, individual disagreement assessment by which the participant verified agreement of the data, and external audit.

Credibility. I demonstrated credibility of the interviews through member checking responses to check for accuracy. Both during and at the close of each interview the interviewer repeated the interviewee's response to check for trustworthiness in recording. Additionally, any disagreements identified amongst interview samples were assessed individually, rather than

categorizing immediately (Harding, 2013). Specifically, participants were asked to review the interview transcription and provide agreement prior to coding.

Dependability. The dependability of the study refers to "research procedures that are clearly defined and open to scrutiny" (Stringer, 2007, p. 57). Throughout the study dependability of these data collected through the fidelity checks was assessed based on an external audit. IEP team members, as part of IEP progress reporting, reviewed the external audit of the data. Participants were given feedback from fidelity checks immediately after data collection so they could questions regarding the accuracy of the protocol implementation, which gave staff a chance to review the implemented protocol.

Expected Findings

The central research question addresses the experiences of professional and support staff at a suburban Philadelphia school district regarding the increased frequency of fidelity checks for behavior protocols. I expected that professional and support staff would report a better understanding and confidence in the protocol they were being asked to implement when the frequency of fidelity checks was increased. I also expected to find a higher rate of accuracy in the implementation of the behavior protocols with the increased frequency of fidelity checks, and a reduction in problem behavior with an increase in the frequency of fidelity checks specific to the behavior protocols of this study.

I expected a rise in overall skill acquisition with the increase in frequency of fidelity checks of behavior protocols and higher rates of behavior protocol implementation accuracy with the occurrences of more frequent fidelity checks. Furthermore, I believed that more frequent fidelity checks, which would ultimately result in better protocol implementation, would subsequently result

in a decrease in the identified problem behavior. I believed that this would occur with increased collaboration and consultation. With the overall decrease in problem behavior, staff would spend less time managing problem behavior throughout the day, which would provide more instructional time and learning opportunities for the student. With more instructional time available, individual students' overall skill acquisition was expected to improve, specifically discrete skills measured on the VB-MAPP (Verbal Behavior Milestones Assessment and Placement Program).

I will utilize the results of this study in my future professional responsibilities. Particularly the experiences of the participants, to develop the consultative model I provide within classrooms. Such consultative models could include additional fidelity checks and consultative meetings, as well as organized communication domains.

Ethical Concerns

Conflict of Interest Assessment

This research included frequency variations of fidelity checks for behavior protocols that are implemented in everyday practices at the study location. I maintained the ethical principles as outlined in the Belmont Report as respect for persons, beneficence, and justice (United States: National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978). The designed intervention to the student's programming was not compromised at any point. The study focused exclusively on the accuracy of the intervention implementation and how fidelity checks and their frequency affect the accuracy of the protocol implementation. Because the activities included everyday practices at the school, there was no financial gain for any party, and participants' roles did not change, a conflict of interest was not present. Throughout the

study, all ethical guidelines as outlined by Concordia University's IRB, were followed (EDDR 697 Course Design and Overview, 2017).

Prior to this research I had experience teaching autism support, and as a behavior analyst for the district. Within these roles I prioritized the fidelity of interventions as critical to protocol implementation. The descriptive analysis component of these data is new to me as a behavior analyst, but the frequency data are familiar through my everyday job activities. However, I hope to incorporate more descriptive analysis into my daily activities within my job.

Researcher's Position

I had no conflict of interest in this research study. The participants I recruited were colleagues, not subordinates. The participants were asked to be involved in the study based on their everyday responsibilities in which they implement the behavior protocols I studied.

Potential Ethical Problems in the Study

Participants were recruited via a recruitment email (see Appendix J), which discussed the scope of the study and requested their participation in the study. The only additional request was to participate in an additional interview, as described in detail in the consent form that participants signed prior to beginning the study (see Appendix J). Additionally, participants were informed that the assistant superintendent had allowed me to conduct this study (see Appendix I). There was no deception in this study, and all participants were aware of their participation, and availability to withdraw from the study should they wish.

Chapter Summary

This chapter reviewed the study, which examined the experiences of professional and support staff at a suburban Philadelphia school district regarding the increased frequency of fidelity

checks for behavior protocols. Staff members working with students on specific behavior protocols, such as the Accepting No and Wait protocols, were monitored at varying frequencies using fidelity checks and performance feedback. At the close of the study interviews took place with all participants. These interviews took a constructivist approach as I reflected upon participants' experiences. The overall goal of the study was to better understand the effects of fidelity checks on behavior protocol implementation. Significant collaboration was included to ensure the ethical professional responsibilities of all participants were maintained as the study was carried out.

Chapter 4: Data Analysis and Results

In this chapter, I discuss the data analysis and results of the study. The chapter is organized into an introduction and description of the research background of myself as the researcher and of seven participants, a description of the research methods and analysis, a summary of the findings, a presentation of the data and results, and a chapter summary. Presented are the data in support of answers to the main research question, which asked: What are the experiences of professional and support staff in a suburban Philadelphia school district regarding the increased frequency of fidelity checks for behavior protocols? Additional data are presented regarding the following subquestions:

1. What is the relationship between frequency of fidelity checks of behavior protocols and accuracy of intervention implementation?
2. What is the relationship between frequency of fidelity checks of behavior protocols and problem behavior?
3. What is the relationship between frequency of fidelity checks of behavior protocols and skill acquisition?

The data analysis detailed in this chapter includes both qualitative and quantitative components. The fidelity checks were a descriptive measure of frequency in that they measured the accuracy of implementation per step of the protocol and reported an overall percentage of the protocol's implementation by each study participant. Qualitative data collection strategies were employed in the interviews conducted during the course of this study. Evaluation of the performance feedback, collected at the close of each fidelity check, relied on qualitative methods as well. All components of the data collection contributed to the action research approach of this study, which focused on the value of participant feedback.

The results of the study yielded higher fidelity scores for those participants who had received more frequent fidelity checks. Staff provided with more frequent fidelity checks also showed a decrease in problem behavior for the students with whom they worked. An increase in skill acquisition, as well as a decrease in problem behavior was identified. Overall, participant feedback was positive and supportive of the increase in fidelity checks. Participants reported, with more frequent fidelity checks, that they felt better trained and more able to perform their duties.

Research background. Prior to this research, I taught in an autism support classroom for 6 years and served as a board-certified behavior analyst for the district for 8 years. Additionally, I have worked within homes as a behavioral consultant developing behavior intervention programs for individuals with maladaptive behaviors that significantly impede their lives. As a behavior analyst, both in the district and private sectors, I consider the fidelity of interventions as highly important. Quantitative measures are a familiar form of data in my daily job; however, the qualitative component of teacher interviews was a less familiar component that I hope to include more often in my daily activities within my job. Outside of the interviews, the data collected in this study were data obtained within the normal daily activities of my job, but at less frequent intervals. I will use the results of this study, specifically those pertaining to the experiences shared by the participants during the interviews, to shape the consultative model I provide within classrooms. Such consultative models will include increased numbers of fidelity checks as a result of this study, as well as formalized consultative meetings and organized communication domains.

Definition of terms. Within this study, treatment integrity was measured with the use of fidelity checks.

Treatment integrity. In this study, the term refers to the close monitoring of accurate implementation of behavior interventions by staff (Bruce et al., 2001).

Fidelity checks. These checks are scheduled observations to ensure that individual steps of designed interventions are implemented as intended (Mayer et al., 2014).

Description of the sample. Because this was an action research study, two types of data were collected from a purposeful sample of participants ($N = 7$). The first type of data comprised fidelity checks with performance feedback. The second type of data were collected through interviews. The purposeful sample of the study consisted of seven participants, who were all targeted based on the specific protocols they were asked to implement within their job assignments. All seven participants serviced students within the same autism-support classroom at the same suburban Philadelphia school district. Although all participants serviced the same students, many had different roles within the IEP teams.

Mary. Mary is a Caucasian woman in her mid-30s, who had been working with students on the autism spectrum for approximately 5 years. She has a bachelor's degree in school counseling and services the students as a paraprofessional. She had 1 year of prior experience with the Accepting No protocol before this study began.

Jinny. Jinny is a Caucasian woman in her mid-40s, who had been working with students on the autism spectrum for 12 years. She has a master's degree is special education and services the students as the autism support teacher. She had 10 years of experience with the Accepting No protocol prior to this study.

Leslie. Leslie is a Caucasian woman in her late 40s, who has been working with students on the autism spectrum for approximately 5 years. She has a bachelor's degree in exercise physiology

and supports the students as a paraprofessional. This study was her first experience with the Wait protocol.

Abby. Abby is a Caucasian woman in her early 50s, who had been working with students on the autism spectrum for 11 years. She has a bachelor's degree in early childhood education and supports the students as a paraprofessional. Abby had 1 year of experience in working with the Accepting No protocol prior to this study.

Sam. Sam is a Caucasian woman in her late 20s, who had been working with children on the autism spectrum for 8 years. She worked both in the school district and the private sector with students with autism. Sam has an associate degree and serves the students as a paraprofessional. She had 8 years of experience working with the Accepting No protocol.

Jackie. Jackie is a Caucasian woman in her late 20s who has been working with kids on the spectrum for 6 years. She has a master's degree in speech pathology and serviced the students in this study as a speech and language pathologist. She had 1 year of experience with the Accepting No protocol, but minimal direct experience with implementation of the protocol.

Karen. Karen is a Caucasian woman in her late 40s, who had been working with children on the autism spectrum for over 25 years. She has a doctorate degree in occupational therapy and serviced the students in this study as an occupational therapist. She had approximately 5 years of experience with the Wait protocol, but minimal experience with direct implementation of the protocol.

Fidelity checks: I collected the fidelity-check data on the following days: September 5, 7, 11, 14, 18, 21, 25, 27 and October 2 and 4, 2017 (see Appendix K). All *Yes*, all *No, and* all *Not Applicable* answers were counted. The fidelity checks provided frequency measures through the

factual counting of increased accuracy in protocol implementation. These data, thus, provided a descriptive measure of the participants' improvement in the implementation of a protocol, which they were asked to carry out, regardless of any presence of (a qualitative component of) consultative support provided.

Research Method and Analysis

Research Method

This study used an action research approach, as it was systemic in identifying a solution to a problem faced in everyday life (Stringer, 2007). Action research differs from traditional scientific research in that it does not look for generalizable explanations for all environments. Rather, action research centers its research on specific situations and targeted solutions. Stringer (2007) wrote that this type of research is characterized by

- a focus on a problem or issue to be investigated,
- a systemic process of inquiry, and
- development of explanations that lead to increased understanding (p. 5).

Action research is systematic through its methodical processes of inquiry. It entails a rigorous investigation, which guides people through the understanding of a phenomenon (Stringer, 2007).

Throughout the action research study, collaboration is key (Stinger, 2007). The "subjects" are viewed as equal participants in the research process (Stinger, 2007). The role of the principal investigator becomes facilitative and less directive. The action research approach to addressing a problem helps all stakeholders to study a phenomenon they are faced with and examine potential solutions to such (Stringer, 2007).

Stringer's (2007) basic framework of action research follows the model of Look, Think, Act (see Figure 1). This model encourages participants to start their inquiries in a direct manner and build the details of the process as issues arise in the study. Within this model there are three continuous stages of activities. The *look* stage gathers data and builds a picture. The *think* stage explores, analyzes, and theorizes data. During the final *act* stage, the implementation and evaluation occur. As each set of activities is completed, participants review, reflect, and re-act. Stringer (2007) noted, "Action research is not a neat, orderly activity that allows participants to proceed step-by-step to the end of the process" (p. 18).

This model applied to the study as participants remained active members of the research. Data were collected during *look* phases. *Think* phases served to reflect on the data and review participant feedback. The *act* phases then instituted actions as a result of the data collection and analysis.

Data Analysis

In the following sections, I discuss three forms of data analysis: (a) performance feedback and discussion, (b) fidelity checks, and (c) interview data. Following is an abbreviated summary of the kinds of data I collected and the results of the data analysis. In subsequent sections of this chapter, I will discuss the results in greater detail.

Performance Feedback and Discussion

Performance feedback, as well as participant discussions, were collected at the close of each fidelity check. The participant and I discussed the fidelity check: what worked, what did not work, and what could be improved upon, as well as direct modeling and additional training regarding the protocol when needed. This discussion was critical to providing adjustments (i.e., action) within

this action research study. The feedback and the discussion provided by the participants during the study allowed for the consultative support model of services to be adjusted with respect to the manner in which the fidelity checks were delivered, with the ultimate goal of increasing the fidelity of protocol implementation.

The fidelity of program implementation is critical to any protocol. The fidelity of the behavior protocol is an essential factor in determining the success of the intervention (Cooper et al., 2007). In order to effectively change behavior, protocols must be followed consistently and accurately to ensure fidelity (Cooper et al., 2007). Furthermore, tools such as fidelity checks not only serve as data collection measurements, but also as training tools to better allow staff to self-monitor their own protocol implementation. It is through these fidelity checks, which are based on the principles of applied behavior analysis, that the quality of protocol implementation is increased and, ultimately, the amount of time students engage in problem behavior is decreased.

Fidelity checks. The 34 fidelity checks, which were completed on seven different participants over the course of 21 school days, were analyzed by percentage of accuracy and reported by accuracy based on the number of individual fidelity checks participants had received. The fidelity checks were further analyzed per step of each protocol. This typological analysis of the mean score of each step was completed per protocol (Hatch, 2002). This analysis allowed for consultation to participants to focus on areas of both group and individual needs. Furthermore, it identified trends in implementation across participants. Specific data results are noted in the Presentation of Data and Results section.

Interview data. Postinterviews were conducted and transcribed. These data were, then, summarized and coded for analysis of similarities, differences, and commonalities (Harding, 2013).

Four themes emerged from the data: (a) overall experience, (b) behavior analyst support, (c) effectiveness, and (d) limitations. Codes were identified after the interviews were thoroughly analyzed, as key phrases were highlighted to indicate important aspects of the interview for the reader. Of this information, interviews were then bulleted into summary points and coded for similarities and differences. Sixteen codes were originally identified, but further analysis broke down two of the codes to finalize the number of codes as 18 (see Appendix L). These codes were written next to each bullet in the summarized interview. With the 18 codes bulleted, themes were then identified after categorizing the codes according to similarities and differences. The themes were supported by the direct quotes of participants as highlighted in the presentation of these data and results.

Theme: Overall Experience. Three codes supported the theme overall experience: (a) positive experience, (b) request for more fidelity checks, and (c) request for more consult.

Theme: Behavior Analyst Support. Six codes supported the theme behavior analyst support: (a) comfortable asking questions, (b) class consult helpful, (c) modeling/hands-on helpful, (d) review of fidelity check helpful, (e) formal consult meetings helpful, and (f) Google Drive helpful.

Theme: Effectiveness. Five codes supported the theme effectiveness: (a) report as effective protocol, (b) kids' problem behavior reduced, (c) staff more confident, (d) using fidelity check as self-monitoring tool, and (e) protocol not lacking.

Theme: Limitations. Four codes supported the theme limitations: (a) not enough staff, (b) not enough consult time, (c) lack of administrative support, and (d) lack of colleague support.

Additional information regarding the details of the procedures of this study can be found in Chapter 3. Raw data of the study are summarized and discussed within this chapter. Samples of the data c9lection tools can be found in the appendixes.

Summary of the Findings

Action research takes a collaborative approach to investigating a specific problem by taking systemic action (Stringer, 2007). Stringer (2007) used a basic research model of Look, Think, Act to facilitate the action research process. Throughout the *look* phase, the focus is on gathering data, as well as defining the problem. During the *think* phase, analyzing and theorizing occurs, and during the *act* phase, reporting is done. Figure 3 highlights the systemic actions that transpired throughout this action research study and its repetitive cycles. The first *look* phase began with the initiation of fidelity checks and continued to the *think* phase of reviewing these fidelity checks and collecting participant feedback. In the next phase, it was determined to *act*, because an increase of formalized consults appeared to be beneficial. The team added biweekly consultative meetings with all staff working with students who required either the Accepting No or the Wait protocol. The cycle reinitiated, and the *look* phase started with fidelity checks and classroom consults. In continuing to the *think* phase, fidelity checks were reviewed and participant feedback was gathered. At this time it was determined that staff needed a more organized and efficient manner for accessing student record, which resulted in the *act* phase of developing individualized Google Drive folders for each student with pertinent behavioral information. Staff working with those students were granted access to individual student files. The *look* phase commenced once more as interviews were conducted. Intricate details of how these actions evolved are discussed in further detail in the follow-up section.

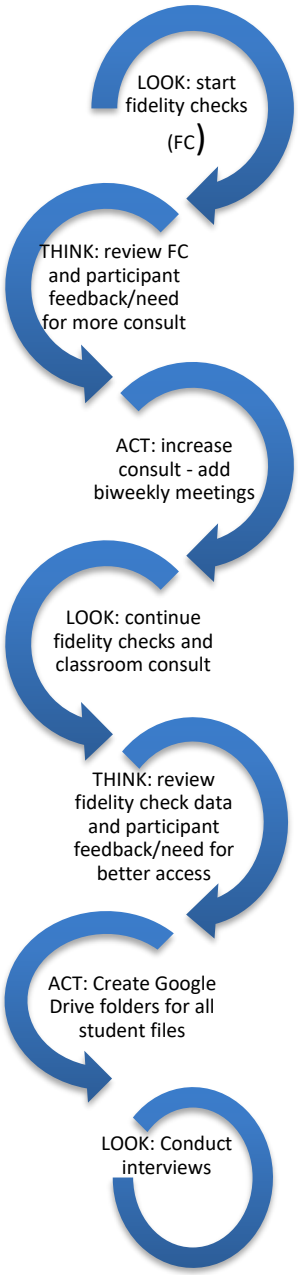


Figure 3. Action research steps of *Look, Think, Act* taken throughout the study.

The data collected during this action research study indicated that the participants registered positive experiences due to increased frequency of fidelity checks for behavior protocols. The data showed higher competency rates for those staff who received more fidelity checks, evidenced by increased percentages of implementation accuracy. Additionally, the data indicated for those students whose behavior plans were monitored with the fidelity checks that the total duration of problem behavior decreased throughout the course of this study. Data also indicated a rise in skill acquisition for these students.

Presentation of the Data and Results

Data and results are presented, first, by addressing the main research question: What are the experiences of professional and support staff at a suburban Philadelphia school district regarding the increased frequency of fidelity checks for behavior protocols? To answer this research question I used the interview data only.

Three subquestions were also asked:

1. What is the relationship between frequency of fidelity checks of behavior protocols and accuracy of intervention implementation?
2. What is the relationship between frequency of fidelity checks of behavior protocols and problem behavior?
3. What is the relationship between frequency of fidelity checks of behavior protocols and skill acquisition?

Descriptive statistics were used to answer each of these research subquestions. The data are presented in tables and graphs. Additionally, interview data (qualitative in nature) were used to answer the second and third subquestion.

Prior to answering any of the research questions, I analyzed the interview data and noted the emergence of four themes. In this section, I discuss these four themes gleaned from the interview process and explain how they relate to the main research question. I also discuss the two actions that took place during the study as part of the first theme.

The cycle of research questions and themes illustrates where in the action research study individual themes were identified. Figure 3 also illustrates where in the *look, think, act* cycle data were collected to provide answers to individual research questions. Data contributing to answering the research questions, as well as identifying the themes, occurred throughout the action research study, as previously noted.

Theme 1: **Overall experience.** The first theme identified was overall experience. According to the interviews conducted at the close of the study, all seven participants reported the study to be an overall positive experience. All participants, except Abby, specifically requested additional fidelity checks as a follow-up to the study. Sam noted:

> I would like fidelity checks to continue to make sure I continue to do the right thing. Maybe, we could even start to do fidelity checks on each other, as assistants. If we do fidelity checks on each other, we would be giving feedback to each other more often. I would like getting feedback from everyone, too. If I am doing something wrong, I want to know, so I can fix it. I don't want to keep doing it the wrong way until the next time you are able to come into the classroom.

Mary concurred with this idea:

> I like Sam's idea of fidelity checks with one another. That could help keep us all on the same page. Those of us who are stronger with the protocol could help those who aren't. I think it would help us as a classroom staff to get stronger with the protocols faster.

Through discussion of the participants' overall experience the need for additional consultation time among staff members was often referred to. All participants, except Mary, specifically requested additional consultation time as a follow-up to the study. Abby shared:

> Consultation time where we can talk together about what works and what doesn't would be best for everyone, not just me. We just need administration to find time for this. If we don't have time set aside for this, it will never happen. There are too many of us to stay after school. We have responsibilities outside of the school day.

Leslie, who was new to the classroom and these protocols this year, shared:

> As someone who is new to this classroom and these protocols, the consult helped me to be able to hear how everyone else was handling the nuances. Everyone has been helpful, but I don't like to talk in front of the students. If we had time assigned at the end of the day, it would be helpful. I know there is a lot to get done, but maybe we could be relieved of some other duties once in a while, and we could meet as a team.

Action 1. As a result of the participant feedback during the fidelity checks, the first action that took place during this action research study was the implementation of direct consultation meetings for all team members. Participant feedback indicated the request for additional consultation time to be scheduled outside of the student day. Team members included all seven study participants and, by invitation, also some staff such as general education teachers who serviced the students who had the identified protocols as part of their IEP. During the first week of

the study, Jackie and Karen requested to set up a meeting to discuss the protocols as a team. This was set up at the end of the day when students were dismissed at 3 p.m. and staff was required to remain in the building until 3:45. Behavior protocols were reviewed by the entire team, and all participants requested additional meetings. During the closing interview, all participants, except Abby, noted that these meeting were helpful and requested to continue with such meetings post intervention. Karen noted:

> For the first time in years, I feel like we are making progress with these kids! This level of consultation that is coming from the fidelity checks is amazing! I am excited to come to work because I like working on a team, a team that is making progress with the kids!

Jackie also shared her excitement for the collaborative meetings. She agreed with Karen because, as an ancillary service provider who does not provide services directly in the classroom, having these meeting allowed her to participate in increased collaboration. She shared:

> I finally understand what is going on in there [the classrooms], and feel like I can provide better speech therapy because of it. It is all because of the consult that we now have! I totally believe that we could make even more progress with these kids. I want to start doing fidelity checks on the kids' speech goals now, too!

The special education teacher, Jinny, shared a unique perspective in that the meetings allowed the paraprofessionals assigned to her classroom to hear the information from multiple professional staff, so that they did not have to rely on her as the sole source of communication. Jinny stated:

> I love having the consult meetings because it gives the assistants the chance to hear everything from others, not just from me. It helps hearing what they need to do from speech

or OT. I also feel like sometimes I don't know the answer to their questions on the spot, but now I say, "Let's talk about it at the meeting."

Action 2. A second action taken during this action research study as a result of the participant feedback during the fidelity checks was the creation of Google Drive folders for individual student protocols, data sheets, reinforcer assessments, and more. These were created during the second week to allow for all necessary information to be shared quickly and collaboratively in a manner compliant with the Family Education Rights and Privacy Act (FERPA). All participants, except Mary and Leslie, specifically commented on the helpfulness of this system. Jackie shared:

> I love that we are organized with Google. It all started with the fidelity checks and now we are actually working like a team! Having all the information organized and accessible is so helpful. It allows me to review any updates or data without having to disrupt a lesson by asking or waiting for someone to have to retrieve the information. Very efficient!

The special education teacher in the sample, Jinny, also provided positive feedback regarding the use of Google Drive. She remarked:

> This makes everything so much easier because the assistants have all the information they need. They don't need to come to me for it. They can log on and get the information wherever they are at, in the classroom, in general education, at home, wherever. This is so much easier.

Jinny and Leslie noted increased confidence in their own ability to implement the protocol. Jinny shared:

> I feel a lot more comfortable with the protocol this year than I ever did in years before. And it's interesting because I feel like this year my students' behavior is not nearly as intense as it has been in years prior. I think all the training and support we had in the classroom provided a better starting block to get the behaviors in check this year.

Leslie, Sam, Jackie, and Karen reported using the fidelity check as a tool for self-monitoring their implementation of the protocol when not being assessed by a third party. Leslie shared:

> I still feel new to this room, so using the fidelity check to self-monitor my own procedures helps me make sure I am being effective. I like the tool for that. I know when I am doing something wrong and how to fix it.

Theme 2: Behavior analyst support. The second theme, behavior analyst support, emerged from the interview data and helped to answer the main research question: What are the experiences of professional and support staff at a suburban Philadelphia school district regarding the increased frequency of fidelity checks for behavior protocols? Five participants, Mary, Leslie, Jinny, Abby, and Sam, who worked directly in the classroom noted that the classroom-based consults were helpful. This classroom consult was in reference to a new responsibility of the behavior analyst to provide classroom consultation regarding behavior strategies/supports for half a day per week; this new requirement had started 1 week prior to the study. Mary and Leslie specifically noted that the modeling and hands-on support were most helpful. Leslie shared:

> I like the consult and modeling. Being able to show me right there is what I need. That is how I get better. I'm a hands-on learner; so, working in the room while the kids are there is what is most helpful for me.

Mary, Sam, and Jinny were in agreement that "the more consult, the better." Sam shared:

> I really don't think we could have too much consult. These are complex protocols, and these kids have very complicated programs in general. The more you are able to get in there and show the staff, demonstrate for them, the more they are able to see the right way to do it. It will also allow for more fidelity checks to occur, since you will be present in the classroom.

Abby agreed that the classroom-based consultation was helpful, but elaborated that this also made her nervous and somewhat anxious, at least at first. She stated:

> I see the importance of the classroom consults, and I think they are helpful, but I was very nervous with them at first. I get nervous when I am being watched. Or maybe it was like test anxiety. But now I see it's really about the kids, and it is exciting to see all the progress they are making. Tommy's behaviors have gone down so much! He's a totally different kid, and I see it's because we are all consistent in what we are doing with his behavior program.

Theme 3: Effectiveness. All participants described the protocol as being effective and noted that they could observe a decrease in problem behaviors. Jinny shared:

> It was exciting to see how much progress the kids made. When completing their monthly progress reports I was surprised at how quickly the behavior had decreased. In the moment it felt longer, but seeing the data, I realized it was much sooner.

Mary shared:

> It is nice to see Sally able to participate in the regular classroom more. Now that she is not having as many behaviors, we are able to be included much more. She is really happy when she is with her friends in the regular classroom!

Theme 4: Limitations. All participants, except Abby, specifically noted that they did not feel the protocol was lacking any components. However, Abby and Karen both specifically mentioned not having enough staff. Abby shared:

> Administration does not give us enough people, so we can run the protocols how we need to. Sometimes we have six kids in the room and only three adults. It is difficult to run the program if you have three kids who need a protocol run at the same time. Administration should be trained on the protocols too. Then they would know when to step in when they are in the room.

Mary, Leslie, Jinny, and Abby shared feelings about the lack of administrative support as well. Jinny shared:

> Administration can be distracting when we are running the protocols. They do not understand them, and they will start talking to the kids. They will sometimes interfere with our intervention by talking to us or offering help when we are just trying to ride out the behavior.

All four themes—overall experience, behavior analyst support, effectiveness, and limitations—supported answering the main research question. Two actions were taken: adding biweekly consultation meetings and creating individual student Google Drive folders in response to the participants' feedback and participation in the study. The subquestions were answered with the quantitative data and supplemental interview data, as shown in the following sections.

Subquestion 1: What is the relationship between frequency of fidelity checks of behavior protocols and accuracy of intervention implementation? The data collected throughout the intervention indicated that all participants increased their competency of implementing the protocol.

Participants whose protocol fidelity was checked nine times achieved up to 100% accuracy. Participants whose protocol fidelity was checked five times achieved up to 91% accuracy. Participants whose protocol fidelity was checked two or three times achieved between 80% and 90% accuracy.

Table 1

Participant Data for Protocol Implementation Based on Fidelity Check Percentage (N = 7)

	Times Checked									
Participant	1	2	3	4	5	6	7	8	9	10
Mary	45%	54%	73%	73%	100%	91%	100%	100%	100%	
Jinny	45%		73%		91%		91%		91%	
Leslie			55%							90%
Abby	55%				64%				82%	
Sam	73%	73%	82%	82%	91%	100%	100%	100%	100%	
Jackie	55%				82%				82%	
Karen	50%				80%				80%	

Note. Number of times participants were checked for protocol accuracy and the percentage of overall accuracy of the checks.

Subquestion 2: What is the relationship between frequency of fidelity checks of behavior protocols and problem behavior? All fidelity checks administered across the seven staff participants involved only three students. Each of the three students involved showed decreased daily averages in minutes of problem behavior. Table 2 visually depicts this information.

Table 2

Problem Behavior and Skill Acquisition by Learners

Child Participant	Number of Fidelity Checks	First Day of Study		Last Day of Study	
		Behavior	Skills	Behavior	Skills
Sally	15	54	1	0	13
Tommy	14	21	0	1	5
Bobby	5	12	0	0	2

Note. Problem behavior reported in minutes per day and skills acquired per day on the first and last day of the study.

As indicated by participants during interviews, problem behaviors of the students decreased with increased fidelity checks. The third theme, effectiveness, that emerged from the interview data also supported the answers to this subquestion. All seven participants reported that they considered the protocol to be effective. Sam shared:

> I graph the kids' data weekly, and I see everyone's data going down! It is really exciting to see all the kids' data getting so much better. I have other staff in the building mentioning that they notice it too.

Jackie and Karen both noted a change in the students' behavior as well, when the latter were in their therapeutic environments. Karen stated:

> The kids are coming in calmer. I see the kids able to transition into the therapy room and initiate their routine with less behaviors now. They need far less prompting to get started on their sensory motor morning routine. For several kids this was a real challenge before. There were significant behaviors that would occur.

Leslie discussed how much more comfortable she felt working with the students thanks to the reduction in problem behavior. She said:

> When I was first transferred to this classroom at the start of the school year, I was worried. I was worried that I would not be able to handle the behaviors. After just a few week, I realized that I didn't need to worry. I know we have a lot of work to do still, but I know we will get there.

Jinny, who is responsible for providing monthly progress reports on IEP goals to the members of the IEP team and to the parents upon request, also commented on the students' reduction of problem behavior and, furthermore, how quickly she now could identify the trends. She shared:

> After seeing how much progress the students made in the first month with these protocols, I am excited to see what's next! I want to see how we can continue to improve their behavior so they can be included in regular education more.

Subquestion 3. What is the relationship between frequency of fidelity checks of behavior protocols and skill acquisition? All three students increased the number of daily acquired target skills. Sally improved from 1 to 13, Tommy from 0 to 5, and Bobby from 0 to 2 (see Table 2).

Staff interviews also indicated an increase in students' skill acquisition. Mary shared:

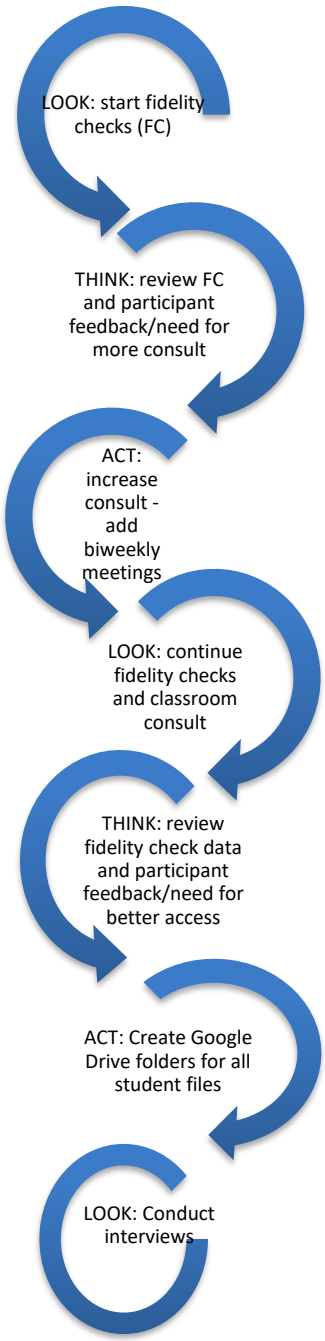
> I can't believe how much Sally is learning! Every day she is gaining new skills, and it is so exciting to see. I am starting to see new interests come out too.

Jackie also commented on the students' skill acquisition. She noted:

> The students' therapy time is so much better now. The students are making so much more progress because we are not spending the whole session dealing with behaviors. I think some of the students may be able to work in dyads soon too! We were never able to do this because there were so many behaviors.

Figure 4 depicts the action research process: The left side of the drawing shows the staff and student changes as they occurred when the Look-Think-Act steps went through several cycles. On the right side is a listing of observed results, at the corresponding times during this study.

The action research cycle of Look, Think, Act demonstrated participant involvement and change throughout the duration of the study. Both actions of (a) formalizing consultation meetings and (b) creating Google Drive folders for each student were instituted as a result of participant involvement.



Staff and Student Changes

→ Think: Students' problem behaviors begin to decrease.

→ Act: Staff report being more comfortable with protocol.

→ Look: All student problem behaviors decreased significantly.

→ Act: Staff competency between 80% and 100%.

Figure 4. Action research steps of *Look, Think, Act* taken throughout the study and the corresponding staff and student changes that occurred.

Chapter Summary

The results of this action research study showed an increase in accuracy of the implementation of the behavioral protocols of all participants. All staff reported a positive experience throughout the study. They felt that the procedures of utilizing fidelity checks were effective and resulted in a significant decrease of problem behaviors for all students. In the next chapter, I further discuss the results, examine how the findings relate to extant literature, consider limitations of the study, and offer recommendations for practical application and further research.

Chapter 5: Discussion and Conclusion

The purpose of this chapter is to discuss the results of this action research study. It begins with a brief introduction, followed by a summary of the findings and a discussion of the results with a view toward the extant literature on the topic—some of it reviewed in Chapter 2, and some even more recent. I then review limitations of this action research study, consider implications of the results for practice, and offer recommendations for future research. In Chapter 4, I presented the information I had collected as factual data. In this chapter, I discuss what these data mean, both for me personally and professionally and for the community of practice. I examine how these data inform the literature and how the information gained expands the knowledge pool of the scholarly community.

Summary of the Results

Research questions. This action research study was guided by the main research question: What are the experiences of professional and support staff at a suburban Philadelphia school district regarding the increased frequency of fidelity checks for behavior protocols? The following subquestions were also researched:

1. What is the relationship between frequency of fidelity checks of behavior protocols and accuracy of intervention implementation?
2. What is the relationship between frequency of fidelity checks of behavior protocols and problem behavior?
3. What is the relationship between frequency of fidelity checks of behavior protocols and skill acquisition?

Theory and significance. This action research study was based on a constructivist approach. Constructivism is a learning theory based on both observation and scientific study regarding how people learn (Pelechand & Pieper, 2010; Schcolnik, Kol, & Abarbanel, 2006). The theory rests on the idea that people construct their own understanding and knowledge throughout their experiences and their reflections on such experiences (Pelechand & Pieper, 2010). This process often includes not only an active learning component by hands-on participants, but also a reflection and discussion of how prior knowledge is expanding or evolving (Pelechand & Pieper, 2010).

The constructivist theory anchored this study; it helped to describe the ways in which the participants made meaning of their experiences and their ideas via the participant interview. The participants learned through their hands-on implementation of the protocols and worked collaboratively with the team to provide feedback and suggestions for actions. The staff participants constructed the actions that were taken during the study, based on their experiences. For example, the implementation of biweekly consultation meetings and the development of individual Google Drive folder for students were the actions taken as a result of participant feedback. Each action was initiated and implemented by participants and thereby supported of the constructivist theory.

Constructivism theorist John Dewey called for learning to be based on real experiences. He centered his beliefs on inquiry and on considering alternative possibilities before determining what could be deemed grounded evidence (Schcolnik et al., 2006). Dewey believed that students should be provided with opportunities to think for themselves and arrive at conclusions based on their own experiences. This action research study is congruent with Dewey's beliefs in that the participants in

the study were active members who contributed suggestions for actions to be implemented in order to improve the study.

Vygotsky's (as cited in Pelechand & Pieper, 2010) constructivist theory highlights how people operate with both an independent and an instructional level of performance, and the zone between them was the zone of proximal development. When people are working within the zone of proximal development, they require assistance and guidance to learn new things (Pelechand & Pieper, 2010). This zone was applied to the study when I, as a teacher/evaluator, worked with staff to model and provide feedback regarding the implementation of the protocols. After each fidelity check, I reviewed the accuracy of the implementation, and I specifically reviewed this feedback with the participant. I also modeled accurate implementation and answered questions as needed while gathering participant feedback at this time. This highlighted Vygotsky's zone of proximal development as I provided direct assistance and guidance as participants were learning the new protocol (Pelechand & Pieper, 2010).

This action research study sought "outcomes in ends that are acceptable to stakeholders, rather than those whose degree of success may be measured against some set of fixed criteria" (Stringer, 2007, p. 141). For example, in my study the outcomes benefited stakeholders such as teachers, support staff, parents, and students. The outcomes did not center on benefiting district administration or schoolwide performance scores. The significance of this study lies not only in the improvement of the students' behavior and skill acquisition, but also in its importance for the district in terms of special education funding and resource allocation. Through better managing student behavior, fewer staff would be required, ultimately resulting in lower costs for the district.

Review of recent literature. When working with students with problem behavior, it is essential for staff to utilize evidence-based practices such as applied behavior analysis. The protocols in this study are based on these principles and meet such standards. When evaluating the problem behavior that occurs surrounding the protocols, it is critical to assess whether poor implementation is a factor (Collier-Meek et al., 2017; Owens et al., 2017). In order to effectively assess accurate implementation, observational data measures results more effectively than self-reporting (Gresham, Dart, & Collins, 2017; McKenna & Parenti, 2017). Additional research supports the need and recommends reviewing the collected data with the teams (Pinkelman & Horner, 2016). Pinkelman and Horner (2016) discussed how treatment fidelity and student behavior correlated as a treatment package of (a) observation of fidelity (fidelity checks), (b) collected data on student behavior, (c) fidelity data entered into an online management system, and (d) weekly reviews of data/graphs with the implementing team. Gresham, Dart, and Collins (2017) specifically found that, when observational components of evaluating treatment integrity occurred two times per week, a dependable estimate could be reached after 4 weeks. This suggests that increasing the number of fidelity checks at the start of the intervention would increase implementation accuracy and support a reduction of direct observations as compliance with protocol implementation increases.

Methodology and findings. This study used an action research approach. As the teacher/researcher, I embraced a partnership role with the participants in seeking solutions to a specific problem by taking systemic action (Stringer, 2007). For example, we worked to identify the overall experiences of participants in implementing behavior protocols. Stringer's (2007) model of Look, Think, Act drove this study. The specific problem evaluated was the fidelity of

behavior-protocol implementation. Results indicated that all participants had a positive experience with this action research study. Furthermore, the data showed that, with increased fidelity checks, staff improved their accuracy of protocol implementation. The data also justified the determination that, with more fidelity checks, students' problem behavior decreased and their overall level of skill acquisition increased.

Discussion of the Results

In this section, I first review the big-picture results of the study. These were results that did not specifically answer the research questions posed for the study, but rather provided important insights discovered through this action research. This section will then progress to a discussion of the results and how they answered the main research question and subquestions.

Big picture. Several big picture results emerged from the study. These results included the following topics: college degrees versus training, number of staff required, increased opportunity for inclusion, and potential need for administrator training. Inclusion involves providing students with special needs with an opportunity to learn among their nondisabled age mates within the general education setting.

College degrees versus training. The level of education versus the level of training necessary to implement the protocols effectively was one of the big-picture results that emerged from the study. Sam, a participant who demonstrated the higher end of implementation accuracy, had the lowest level of education. Mary, who also performed the protocol with high accuracy, held only a bachelor's degree, compared to the master's and doctorate-level education of other participants. Both Sam and Mary received the most fidelity checks with performance feedback. This suggests that the hands-on training sessions with the protocol are more influential than

prerequisite education. This information is critical for several reasons. If high educational attainment is not a prerequisite factor in the implementation accuracy of the protocol, this fact expands the pool of applicants for this special classroom. This also changes the pay scale for those required in this position. If paraprofessionals can be effectively trained in the implementation of these protocols, especially paraprofessionals with less formal education, the cost for the district would significantly decrease.

Number of staff required. As problem behavior significantly decreased, fewer staff members were required to manage behaviors. Once students increased their compliance in both Accepting No and Wait, a single staff member would be able to intersperse maintenance probes of the protocols throughout the day in order to maintain that instructional control. Staff to student ratios of 1:1 or 2:1 of would not be required, thus significantly reducing the cost for the district.

Increased opportunity for inclusion. The district in which the study took place had invested a considerable amount of time, money, and resources toward an inclusion initiative over the preceding 3 years. The classroom where the study took place was one of the few exceptions to the norm; it was a classroom with students who were not included in a general-education classroom for any academic content, only limited special areas (e.g., art, music, gym, and library). Due to the effectiveness of the protocol and the reduction of problem behavior, the opportunity for these students to participate in the general education setting increased. Including the students more in the general education setting not only aligns better with the district philosophy, but also places the students in the least restrictive environment with their typically developing peers.

Potential need for administrator training. Several staff members noted during their interviews that administration was not supportive of the protocols. Examples of this lack of support

included not providing sufficient staff to implement the protocols, interrupting staff while implementing the protocols, or simply not knowing what the protocols were meant to accomplish. In order to better support staff and administration through this process, providing administration with separate training could be beneficial and effective. This training would focus on a brief overview of what the protocols are, why they are being utilized, and what administration's role should be while the protocols are being implemented. Often, administrators observe a staff member managing problem behavior and intervene because they feel responsible to assist as an administrator. By providing an explicit plan of what their role should be, confusion could be eliminated about who should be doing what, especially while a problem behavior is occurring.

Main Research Question, Subquestions, and Discussion

The main research question asked: What are the experiences of professional and support staff at a suburban Philadelphia school district regarding the increased frequency of fidelity checks for behavior protocols? Each of the seven participants reported positive experiences, as shown by the interview data, and two specific actions that were taken, based on participant feedback.

First Action

The first action resulting from participant feedback during this action research study was the institution of biweekly consultation meetings for all staff servicing students with the identified behavior protocols in their IEPs. This action received positive feedback from staff. Karen noted:

> For the first time in years, I feel like we are making progress with these kids! This level of consultation that is coming from the fidelity checks is amazing! I am excited to come to work because I like working on a team, a team that is making progress with the kids!

Jackie agreed:

> I finally understand what is going on in there [the classroom], and I feel like I can provide better speech therapy because of it. It is all because of the consult that we now have! I totally believe that we could make even more progress with these kids. I want to start doing fidelity checks on the kids' speech goals now, too!

Jinny stated:

> I love having the consult meetings because this gives the assistants a chance to hear everything from others, not just from me. It helps hearing what they need to do from speech or OT. I also feel like sometimes I don't know the answer to their questions on the spot, but now I say, "Let's talk about it at the meeting."

I believe the biweekly meetings allowed for staff to share their concerns with all team members, but they also ensured that all staff members heard the same message. With multiple staff members working with students on a rotating basis, it was imperative to identify a consistent time when everyone was able to sit down and discuss protocols together. Using this time, and only this time, to first review and then implement changes or modifications to behavior plans allowed for more consistent follow-through from staff. Without these consultation meetings, all communication, including modifications to protocols or reinforcements related to such, would need to be individually communicated to each person working within the classroom. Such an approach would not be efficient in terms of time or accuracy of relaying messages. By having all team members present at the same time, feedback could be taken, changes or updates reviewed, and training provided most efficiently.

Second Action

The second action taken in response to participant feedback was the development of individual Google Drive folders for each student. When considering the number of professionals (i.e., special education teacher, general education teacher, multiple paraprofessionals, occupational therapist, speech and language pathologist, physical therapist, behavior analyst, hearing therapist, classroom nurse, and others) who work with the students in this classroom, it is imperative to have an efficient system for identifying only the most current information for each student. Although all students' cumulative records are available to staff, they often include information that is not pertinent to the current year, while specific data sheets or supporting documents such as reinforcement assessments may be lacking. This action involved creating Google Drive folders for each student that contained only their current documents in support of their IEPs. These documents included the behavior protocols, data sheets, and reinforcer assessments. As the study continued, other team members such as the occupational therapist and speech and language pathologist found value in this action and created subfolders within each student's folder for their own discipline. There, they each included strategies and practice sheets for the paraprofessionals to be working on for generalization. I believe this action to be critical for teams to become more efficient and effective in the implementation of the protocol. By allowing quick and easy access to the necessary documents for each student, there was no delay in implementation for lack of materials. Staff had access at all times to the most current draft of all data sheets being used.

Subquestion 1

Subquestion 1 asked: What is the relationship between frequency of fidelity checks of behavior protocols and accuracy of intervention implementation? Data showed that the participants

with the most fidelity checks improved the most. Data further showed that all participants improved when more fidelity checks were performed, regardless of whether the fidelity checks were spread out over time or provided closer together. This suggests that, when first implementing the protocols, one should provide more frequent fidelity checks at the start and decrease as implementation accuracy improves (Collier-Meek et al., 2017). Once implementation accuracy has been achieved, fidelity checks should not be discontinued, but they should be decreased and used for monitoring on a less frequent basis (Gresham et al., 2017; McKenna & Parenti, 2017). The exact frequency could be determined by slowly titrating the fidelity checks, one at a time, to ensure implementation accuracy remains the same. If there is decrease in the implementation accuracy, the frequency of the fidelity checks could be increased again.

Subquestion 2

Subquestion 2 asked: What is the relationship between frequency of fidelity checks of behavior protocols and problem behavior? All data showed a significant decrease in problem behavior throughout the course of the study. All three students showed an initial increase in response to the intervention. This increase would be expected and referred to as the *extinction burst* (Cooper et al., 2007). When first implementing a new protocol that no longer reinforces the problem behavior, the problem behavior will increase before it decreases (Cooper et al., 2007). This occurred with all three students before a significant decrease was noted on Day 5. The data further showed from minimal to no problem behavior at all, by Day 10, for all three students.

Sally demonstrated a small increase in her problem behavior on Days 17 and 18, when it was reported that her mother left town on a business trip. The protocol was implemented as designed, and she returned to her minimal behavioral episodes the following day. These data

suggest: The more intensive the intervention at the start of implementation, the more effective it will be.

When introducing the Accepting No or Wait protocols, more frequent fidelity checks should be performed. As discussed previously with respect to implementation accuracy of staff, titrating the frequency of the fidelity checks could also be performed when the students begin to decrease their problem behavior. Students' behavior change could be another indicator to begin titrating the frequency of fidelity checks. Once student behavior has decreased and stabilized to a moderate goal level in accordance with their IEP, fidelity checks could decrease systematically to monitor less frequently. This would ultimately require fewer staff and reduce costs for the district.

Subquestion 3

Subquestion 3 asked: What is the relationship between frequency of fidelity checks of behavior protocols and skill acquisition? The data indicated that more frequent fidelity checks resulted in more skills acquired. With the students spending less time engaging in problem behavior, they were able to learn more skills (Lindhiem et al., 2014). As students learned more skills, their opportunities to be included with the general education population increased. This opportunity not only aligned better with the district philosophy, but also placed the students in the least restrictive environment. Furthermore, by increasing their level of skill acquisition, the students' learning abilities changed. With more skills, they were able to be grouped differently and could potentially require less frequent one-to-one instruction. This again, would save the district money because fewer staff would be required.

Discussion of the Results in Relation to the Literature

The experiences of the staff implementing behavior reduction protocols with fidelity in a large Philadelphia suburban school district are not commonly known. Specific behavior protocols are designed to be implemented with explicit procedures to change behavior. Deviations from these procedures jeopardize the fidelity of the plan and, ultimately, its effectiveness (Carroll et al., 2013; Collier-Meek et al., 2017; Cooper et al., 2007; Parsons et al., 2012).

This study has significance for various stakeholders. Part of the significance resides in the potential cost savings that could be achieved by the school district. Effective protocol implementation could result in a reduction in staff needs, which ultimately saves the district money.

The study also has significance for the students. The students for whom the behavior protocols were implemented made tremendous behavior gains. All three students reduced the amount of time they engaged in problem behavior, while simultaneously increasing their overall skill acquisition. The reduction of problem behavior allowed for increased learning time and, ultimately, a higher rate of skill acquisition (Lindhiem, 2014).

Current research supports the use of observational components—such as the fidelity checks used in this study—to assess treatment integrity (Gresham et al., 2017; Pinkelman & Horner, 2016). The results of the study suggested that observational fidelity checks were most effective when done more often. This supports the research of Gresham et al. (2017), who specifically found that, when observational components of evaluating treatment integrity occurred two times per week, dependable estimates could be made.

Limitations

The results of the study turned out as expected by me as the teacher/researcher; however, minor adjustments were required during the implementation of the study. These included schedule changes to the intervention timeline. Additional limitations included sample size, educational background of participants in a small sample, population affected by study, time restrictions, staff running fidelity checks, and participant absences.

Schedule changes. There were changes in the intervention time line of this study. The study was planned to extend over a 6-week period, but after 4.5 weeks, saturation was reached in the collected data. The same response was noted repeatedly: The participants were getting the same accuracy on their fidelity checks.

Sample size. The targeted sample size for this study was from six to 10 participants selected through purposeful sampling. Seven participants were secured and participated throughout the study. This purposeful sample was targeted based on their assignments in working with students who had specific behavior protocols identified in their IEPs. Should this study be replicated, an attempt should be made to increase the sample size.

Educational background of the sample. The educational background and prerequisite training of the participants were also a limitation in this study. Backgrounds did vary from associate- to doctoral-level education, but because there was no ample number of participants at each level, generalizability of the conclusions is limited. Future research should include various educational levels within a larger sample.

Population affected by study. All students with whom these protocols were implemented were part of the same class, at the same school, and had the same autism diagnosis. Should this

research be replicated, this limitation should be expanded upon to implement the protocol with students in other classes, other buildings, and outside of autism-support-specific classrooms.

Time restrictions. The definitive time frame of the school day was a limitation. The 6.5-hour school day restricted the availability of how frequently the fidelity checks could be completed. This restriction cannot be modified if the study is replicated in a school environment, but if fidelity checks were examined in home or clinic settings, time restrictions could be removed.

More staff implementing fidelity checks. The time restriction for me, as the teacher/researcher and the only person implementing fidelity check, was also a limitation. With only one person checking fidelity, not only was the number of checks that could be done within 1 day limited, but other job responsibilities were compromised as well. If this study is replicated, it would be most helpful to have multiple staff trained to implement fidelity checks.

Participant absences. The last limitation identified within this study was participant absences. All participants remained active throughout the duration of the study. One participant was absent for two of the originally scheduled fidelity checks.

Implications of the Results for Practice, Policy, and Theory

The results of this action research are presented to the educational community; not only are they supportive of the findings in the existing literature, but they can also be put to practical use for the benefit of students with special needs, their teachers and support staff, and school districts. Additionally, the results support the constructivist theory.

Practice. While I conducted this study in one autism-support classroom, the results could be applied to other environments. The implementation of similar frequencies of fidelity checks could be undertaken in a variety of school, clinic, or home environments, and similar results would

be achieved. Gresham et al. (2017) described a study that was conducted in a clinic setting; it yielded results similar to those obtained in this action research, which was conducted in the school environment. In both studies, the primary dependent variable was the fidelity of protocol implementation; the independent variable was the frequency of direct-observation fidelity checks. The environment in which the studies were conducted, appeared to have little influence on the results. If this study were replicated with the same frequency of fidelity checks and the same protocols, similar results could be expected in other environments.

Policy. During this action research study, the participants who received the most direct-observation fidelity checks achieved the greatest accuracy in protocol implementation. Several authors reported research results indicating that assessment of behavior protocol fidelity was increasingly more effective, the higher the frequency rate of observational data collection (Gresham et al., 2017; McKenna & Parenti, 2017). These results could support the policy of standard fidelity checks for staff. These fidelity checks could also be considered as contributing factors in staff evaluations. Using the fidelity checks as sources of input toward evaluations could motivate staff to perform better. With better implementation, the frequency of fidelity checks could be reduced, and the overall number of staff members required would be decreased. These are both cost-saving factors for the district.

Theory. The results of this study support to the constructivist theory. Constructivism is a learning theory based on both observation and scientific study regarding how people learn (Pelechand & Pieper, 2010; Schcolnik, Kol, & Abarbanel, 2006). The theory centers on the principle that people construct their own understanding and knowledge throughout their experiences and reflections upon such experiences (Pelechand & Pieper, 2010). This study

supported this theory as participants reported overall positive experiences. More significantly, participant feedback drove the actions of the study, which centered on increased collaboration of team members. Specifically, the implementation of biweekly consultation meetings and development of individual Google Drive folders for students were the actions taken as a result of the participant feedback. Each action was initiated and implemented by participants, which supports the constructivist theory.

Recommendations for Further Research

The research in this study should be replicated; I would expect that similar result would be obtained. Recommendations to expand on the existing research include areas of prerequisite training, frequency of fidelity checks, and administrative support training. Each of these areas was addressed throughout this paper as a limitation or as a big-picture result.

Prerequisite training. One of the big-picture results that emerged from this study was insight into how prerequisite training versus college degrees impacted the accuracy of protocol implementation. This study revealed that two participants with the lowest educational level, an associate degree and a bachelor's degree, were able to achieve the highest implementation accuracy scores, after receiving the highest number of fidelity checks. This finding puts into question the significance of college degrees versus prerequisite training, with specific implications for what kind of staff should be hired and whether the district could potentially save substantial sums of money in staff salaries. Further research specific to the background of the staff implementing the protocol should be conducted to examine what is more effective to the overall accuracy of protocol implementation, prerequisite training and a college degree versus protocol-specific training.

Frequency of fidelity checks. The results of the study showed that fidelity checks were effective tools for increasing the accuracy of protocol implementation. Further research should be conducted to examine the best use of fidelity checks, once proficiency in protocol implementation has been reached. This research should specifically try to determine with what frequency fidelity checks need to be used in order to maintain proficiency on an ongoing basis.

Administrative support training. Administrative disruption while implementing protocols was also discussed as an obstacle and potential area for follow-up training. This too could be an area for additional research. Participants reported administrative disruption as a reason for implementation difficulties. Research specific to how this disruption affects protocol implementation and how training for administrators could potentially remedy this dilemma would be beneficial in the overall picture. This information could provide training and guidance for better protocol implementation throughout the district.

Conclusion

Throughout this action research study, the main research question was answered on an ongoing basis. The question examined was: What are the experiences of professional and support staff at a suburban Philadelphia school district regarding the increased frequency of fidelity checks for behavior protocols? Based on participant interviews, all seven participants reported positive experiences throughout this action research study. All seven participants remained involved in the study and provided feedback with respect to the two actions that were taken during the study. The three subquestions examined during this action research study were also answered. Subquestion 1 asked: What is the relationship between frequency of fidelity checks of behavior protocols and accuracy of intervention implementation? The data supported that more frequent fidelity checks

provided to staff led to more accurate protocol implementation. Subquestion 2 asked: What is the relationship between frequency of fidelity checks of behavior protocols and problem behavior? All three students decreased their problem behavior throughout the course of this study. Subquestion 3 asked: What is the relationship between frequency of fidelity checks of behavior protocols and skill acquisition? All three students increased their overall skill acquisition throughout the duration of the study.

This action research study demonstrated that significant benefits derived from the use of fidelity checks with behavior protocols with respect to implementation accuracy. Although further research can be undertaken to assess specific intervals at which these fidelity checks are needed for ongoing supervision, the results of this action research study are clear: Increased frequency of fidelity checks resulted in positive experiences for staff, more accurate implementation of protocols, reduced problem behavior, and higher skill acquisition among the students.

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Appendix A: Qualitative Staff Interview

1. What are your experiences with being trained on the behavior protocol you were asked to implement?
2. What are your experiences with administrative and colleague support in regards to the implementation of the protocol you were asked to utilize?
3. What was your experience with the behavior analyst in the building in terms of availability/accessibility to consult with you regarding questions/concerns you had while being asked to implement this protocol?
4. What was your experience with the behavior analyst in the building in terms of availability/accessibility to consult with you regarding questions/concerns you had outside of direct consult times during the period of the study?
5. What was your overall experience implementing the protocol?

a. Follow-up probes: Was it effective? What do you think it lacked?

Appendix B: Wait Program

1. Tell the student, “You will have to wait,” or similar statement based on skill level.
2. You can count aloud, show the passage of time by using your fingers, or count silently to yourself. For example, say, “Wait, one, two, three...” as you hold up your fingers (count will be predetermined based upon the student).
3. If problem behaviors do not occur during the entire counting interval, deliver reinforcement.
4. If during the counting cycle, problem behavior occurs, stop counting. Wait for the child to be quiet and then restart the count. For example, “wait one, two, three,” etc.
5. Continue this process until you are able to count the entire interval without the student engaging in problem behavior. At this point you can reinforce the student for waiting appropriately.
6. If you repeat the count for many trials and the student continues to engage in problem behavior, you may walk away and the student loses the opportunity to contact reinforcement.
7. If the student moves away from you, make sure he/she remains safe, but do not follow. Simply end your count.
8. If at any point the student re-approaches you, start the procedure over again.
9. Gradually increase the wait interval as the student achieves success.
10. Once the student has had multiple opportunities to practice waiting and has shown success, fade the count and say, “wait” (or something similar) while counting for the required time interval silently.

11. Physically block self-injurious (SIB), aggressive, and property destructive behaviors.
12. Provide an adequate number of wait trials per day.
13. Record the trial-by-trial data and graph daily.

Appendix C: Wait Program Fidelity Checklist

DATE: _____ STAFF: _____ OBSERVER: _____

	YES	NO	N/A
1. When the student requested an item/activity/person were they told "You'll have to wait" or something similar based on skill level?			
2. Immediately following being told to wait, adult hand presented was held up, counting aloud and showing the passage of time by using fingers. Say, "Wait one, two, three…" (count is predetermined based on student).			
3. If problem behavior did not occur throughout entire count interval, reinforcement was delivered immediately upon end of interval?			
4. If problem behavior occurred at any point through counting interval, the count was restarted?			
5. Was the count restarted until an entire interval passed without problem behavior?			
6. If the count was repeated for many trials and the student continued to engage in problem behaviors, did staff walk away if safe to do so?			
7. If the student walked away did the staff make sure student remained staff but did not follow and ended count?			
8. If at any point the student re-approached the staff, was the procedure resumed?			
9. Were self-injurious and aggressive behaviors blocked?			
10. If time dictated was student transitioned to next activity and access to particular reinforcer was lost (preferred)?			
Percent of correct steps:	_____/10		

Appendix D: "Wait" Data Sheet

Name:	Date:	Time: _____ to _____

Behavior Key: Identify individualized abbreviation for problem behavior of student. (e.g. S = screaming, P = pinching, B = biting, etc.)

Date/ Time	Desired item/ activity/ person	Problem Behavior	Number of times count started over	Time/ Duration to appropriate request	Staff initials

Appendix E: "Accepting No" Procedure

1. As you say "No," present a reinforcer or offer another activity by saying, "You cannot have _____, but you can have _____."
2. If the student does not engage in problem behavior, deliver the reinforcer immediately
3. If the student does engage in problem behavior, put the reinforcer away and remove the alternative reinforcer. Do not attend to the problem behavior.
4. Redirect the student to a neutral activity using prompts as needed.
5. Once at a neutral activity, require student to comply with 2-3 tasks without problem behavior before the delivery of reinforcement, but DO NOT deliver the reinforcement that was originally denied. Use a less valuable reinforcer.
6. Physically block self-injurious, and aggressive behaviors.
7. Intersperse trials of alternative and requested reinforcers.
8. Provide an adequate number of Wait trials per day.

Appendix F: "Accepting No" Treatment Fidelity Checklist

DATE:_____ STAFF: _____OBSERVER: _____

	YES	NO	N/A
1. Were a variety of reinforcers available?			
2. When denying a reinforcer, was an alternative reinforcer simultaneously offered? (e.g. "You can't have ___, but you can have ___ while holding up item)			
3. Was alternative reinforcer immediately delivered if accepted by student?			
4. If problem behavior occurred when told "no," were alternative reinforcers immediately withdrawn and access blocked to other reinforcers?			
5. Was the student redirected to a neutral task or moved away (if safe to do so) if problem behavior occurred?			
6. Was the instructional demand maintained as necessary until the student was cooperating without problem behavior for at least 2-3 easy demands?			
7. Once student is cooperative for 2-3 demands was reinforcement delivered (but less when student is cooperative)?			
8. Were trials of "accepting no" and trials in which the student received the requested reinforcer alternated?			
9. Was the reinforcer used during "accepting no trials" alternated?			
10. Was data collected on each trial to indicate whether or not the student was successful?			
11. Were all occurrences of problem behavior tallied?			
Percent of correct steps:	_____/11		

Appendix G: "Accepting No" Data Sheet

Name:	Date:	Time: _____ to _____

Behavior Key: Identify individualized abbreviation for problem behavior of student. (e.g. S = screaming, P = pinching, B = biting, etc.)

Trial	Reinforcer desired	Alternative reinforcer offered	Problem Behavior	Staff initials

Appendix H: Recruitment E-mail to Potential Participants

Hello,

I'm currently working on my doctorate degree in higher education at Concordia University. For my dissertation, I'm researching the integrity of behavior protocols. I will be researching how fidelity checks and performance feedback impacts the implementation of behavior protocols. The specific behavior protocols I will be looking at will be the Accepting No and Wait protocols. I will be completing my research at xxxx, Assistant Superintendent. I would like to recruit those who currently implement these protocols as part of their everyday job responsibilities to be part of this study.

As part of the study, I will observe and complete fidelity checks regarding the implementation of the protocols. I will then provide you with performance feedback as necessary. At the close of the study, I ask that you participate in a short interview to share your experiences in the study. This interview can occur at your convenience.

Your identity will remain confidential when the research is presented. If you are interested in participating in the study, or have any question about the research, you can email me at kxxxxxxxxxxxxx@gmail.com or call me at xxxx.

Thank you,

Kristy

Appendix I: Site Permission Letter

August 2, 2016

Heather Miller, Ph.D.
Faculty Chair of Doctoral Studies
College of Education
Concordia University
2811 NE Holman Street
Portland, OR 97211

Dear Dr. Miller,

The xxxx School District has conditionally approved Ms. Kristin Johnson's request to conduct research in a large suburban school district on the effects of treatment integrity on skill acquisition. This research will involve the creation of treatment integrity checklists for already existing behavior protocols within student's positive behavior support plans. These integrity checks will be conducted on the implementation of the plan, not the student directly. The purpose of developing integrity checklists will be to assist teams in maintaining the integrity of behavior interventions once the evaluation/FBA portion is complete, ultimately allowing for better progress monitoring of said interventions. It is understood that this research is being conducted for her doctoral study at Concordia University.

Please send the IRB Committee's written approval of Ms. Johnson's research project to the Assistant Superintendent's Office.

Should you have any questions or concerns regarding this, please do not hesitate to contact me.

Sincerely,

[signature]

Dr. xxxxxx
Assistant Superintendent

cc: Ms. Kristin Johnson

Appendix J: Consent Form

Research Study Title: Procedural Integrity: A Study of Implementation Integrity Utilizing Fidelity Checks and Performance Feedback

Principal Investigator: Kristin Johnson

Research Institution: Concordia University

Faculty Advisor: Dr. Heather Miller

Purpose and What You Will Be Doing:

The purpose of this action research study is to examine the experiences of professional and support staff at a suburban Philadelphia school district regarding the increased frequency of fidelity checks for behavior protocols. I expect approximately 6 volunteer participants. All participants will be staff assigned to an autism support classroom within the xxxx School District. No one will be paid to be in the study. I will begin enrollment on September 5, 2017, and end enrollment on October 13, 2017. To be in the study, you will be observed in during your normal workday activities of implementing behavior protocols. During this time fidelity checks will be completed on the accuracy of the implementation and consultation will be provided. This will not take any additional time from your already required job duties. At the end of the study you will be asked to complete an interview that will take approximately 1 hour of your time.

Risks:

There are no risks to participating in this study other than providing your information. However, I will protect your information. Any personal information you provide will be coded so it cannot be linked to you. Any name or identifying information you give will be kept securely via electronic encryption or locked inside a filing cabinet or password safe computer. When I, or any

of our investigators look at the data, none of the data will have your name or identifying information. I will refer to your data with a code that only the principal investigator knows links to you. This way, your identifiable information will not be stored with the data. I will not identify you in any publication or report. Your information will be kept private at all times and then all study documents will be destroyed 3 years after I conclude this study.

Benefits:

Information you provide will help evaluate the impact of fidelity checks on the treatment integrity of behavior protocol implementation. You could benefit from this by gaining knowledge and training in their job expectations such as the implementation of the behavior protocols they are required to utilize on a daily basis.

Confidentiality:

This information will not be distributed to any other agency and will be kept private and confidential. The only exception to this is if you tell me abuse or neglect that makes me seriously concerned for your immediate health and safety.

Right to Withdraw:

Your participation is greatly appreciated. You are free at any point to choose not to engage with or stop the study. You may skip any questions you do not wish to answer. This study is not required and there is no penalty for not participating. If at any time you experience a negative emotion from answering the questions, I will stop asking you questions.

Contact Information:

You will receive a copy of this consent form. If you have questions you can talk to or write the principal investigator, Kristin Johnson at email kxxxxxxxxxxxxx@gmail.com. If you want to

talk with a participant advocate other than the investigator, you can write or call the director of our institutional review board, Dr. OraLee Branch (email obranch@cu-portland.edu or call 503-555-6390).

Your Statement of Consent

I have read the above information. I asked questions if I had them, and my questions were answered. I volunteer my consent for this study.

_____	_____
Participant Name	Date
_____	_____
Participant Signature	Date
__Kristin Johnson _____	_____
Investigator Name	Date
__Kristin Johnson _____	_____
Investigator Signature	Date

Investigator: Kristin Johnson; email: kristyriley910@xxx.com;

c/o: Professor Dr. Heather Miller;

Concordia University–Portland

2811 NE Holman Street

Portland, Oregon 97221

Appendix K: Intervention Timeline

This grid served to detail, during each week of this action research study, how many observations I performed of each participant. At the close of each observation, I provided performance feedback to the participant by reviewing the fidelity check, which I completed during the observation. Additionally, I asked the participants for their feedback to improve the process of the action research.

	Participants									
Week	1	2	3	4	5	6	7	8	9	10
1	2x	1x	1x	-	2x	1x	1x	-	1x	-
2	2x	1x	-	1x	2x	1x	-	1x	1x	1x
3	2x	1x	1x	-	2x	1x	1x	-	1x	-
4	2x	1x	-	-	2x	1x	-	-	1x	-
5	2x	1x	1x	-	2x	1x	1x	-	1x	-
6	2x	1x	-	1x	2x	1x	-	1x	1x	1x
7	Complete interviews									
8	Finish interviews if needed – begin analysis									

Appendix L: Themes and Codes

Theme 1: Overall Experience

(a) positive experience
(b) request for fidelity checks
(c) request for consult

Theme 2: Behavior Analyst Support

(a) comfortable asking questions
(b) class consult helpful
(c) modeling/hands-on helpful
(d) review of fidelity check helpful
(e) formal meetings helpful
(f) Google Drive helpful

Theme 3: Effectiveness

(a) report as effective protocol
(b) kids' problem behavior reduced
(c) staff more confident
(d) using fidelity check as self-monitoring tool
(e) protocol not lacking

Theme 4: Limitations

(a) not enough staff
(b) not enough consult time
(c) lack of administrative support
(d) lack of colleague support

Appendix M: Statement of Original Work

I attest that:

1. I have read, understood, and complied with all aspects of the Concordia University-Portland Academic Integrity Policy during the development and writing of this dissertation.
2. Where information and/or materials from outside sources has been used in the production of this dissertation, all information and/or materials from outside sources has been properly referenced and all permissions required for use of the information and/or materials have been obtained, in accordance with research standards outlined in the *Publication Manual of The American Psychological Association*

Kristin Johnson

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Digital Signature

Kristin Johnson

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Name (Typed)

11/20/17

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Date