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EFFECTS OF A COACHING INTERVENTION ON TEACHER'S IMPLEMENTATION OF NATURALISTIC STRATEGIES TO PROMOTE COMMUNICATION IN CHILDREN

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EFFECTS OF A COACHING INTERVENTION ON TEACHER'S
IMPLEMENTATION OF NATURALISTIC STRATEGIES TO
PROMOTE COMMUNICATION IN CHILDREN

THESIS

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in
Education in the College of Education
at the University of Kentucky

By

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Lexington, Kentucky

2017

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ABSTRACT OF THESIS

EFFECTS OF A COACHING INTERVENTION ON TEACHER'S IMPLEMENTATION OF NATURALISTIC STRATEGIES TO PROMOTE COMMUNICATION IN CHILDREN

With accountability on the rise, educators are changing their focus to optimizing instructional strategies in the classroom. Their job performance depends upon their ability to show progress on child outcomes. One way teachers advance this process is by executing more evidence-based practices in their classroom. There is a lack of research in early childhood that report treatment integrity of the treatment package. This study utilized a multicomponent coaching intervention to increasing treatment fidelity of teacher implementation of naturalistic teaching strategies in an early childhood classroom. This coaching intervention could prove to be more efficient and practical for educators. This study added to the external validity and generalization of the findings in an early childhood classroom by using one-two year old children with social communication delays. This study found a functional relationship between training early childhood teachers through a multicomponent coaching intervention and the increase in treatment fidelity of implementing naturalistic teaching strategies with children with communication delays. The percentage of child responses per opportunity increased once the teachers implemented the strategies.

KEYWORDS: Coaching, Video Modeling, Treatment Fidelity, Naturalistic Language Strategies, Early Childhood

Kaitlin J. Dick

June 24th, 2017

EFFECTS OF A COACHING INTERVENTION ON TEACHER'S
IMPLEMENTATION OF NATURALISTIC STRATEGIES TO
PROMOTE COMMUNICATION IN CHILDREN

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June 24th, 2017

I would like to dedicate this thesis to my great aunt, Debbie,
for instilling my first love and passion for special education.

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Chapter One: Review of Literature

Introduction

Educators should use evidence-based practices and interventions in the classroom as they work with children from all stages of development. However, educators may lack adequate support to implement recommended interventions with integrity. According to Wilkinson (2007), “treatment integrity (or fidelity) refers to the extent to which an intervention is implemented as intended (or planned)” (p. 420). Training educators to implement evidence-based practices with fidelity is crucial, given that one of the most important responsibilities of a teacher is to improve child outcomes. With accountability on the rise, educators are changing their focus to optimizing instructional strategies in the classroom. Their job performance depends on their ability to show progress on child outcomes. One way teachers advance this process is by executing more evidence-based practices in their classroom. Current research lends some new issues facing implementing evidence-based practices.

Treatment fidelity has become a pressing issue in educational and behavioral research. Gresham, Gansle, and Noell (1993) reviewed applied behavior analysis studies from 1980 to 1990 and found that treatment integrity (fidelity) was not systematically measured in 75% of the studies reviewed. The authors noted that one can only draw conclusions from an experiment if treatment integrity is monitored. Ledford and Wolery (2013) recently systematically analyzed fourteen journals to evaluate if reporting of procedural fidelity had changed over the years and if it was being measured accurately. They found reporting was increasing over time, but was not always clear to the audience. They found that reporting was variable among journals and disciplines.

Ledford and Wolery also noted that one reason to measure fidelity is to ensure the implementers are adhering to the procedures described (Ledford & Wolery, 2013). Changes in the dependent variable could be caused by an ineffective treatment or an effective treatment implemented poorly. In order to be confident in a functional relation (i.e., the independent variable is the cause of change in the dependent variable) between variables, treatment fidelity should be collected and reported. Failure to report treatment fidelity decreases the confidence in your findings (Gast & Ledford, 2014). Gast & Ledford state that to control for this, one must name and measure all variables in your study, in all conditions (2014). Procedural fidelity plays a vital role in internal validity.

Measuring fidelity is important in group design research, but single case experimental designs are commonly used to assess the effectiveness of an intervention, especially for low incidence populations. Early childhood special education has been using single-subject experimental methods since the 1960's (Wolery & Dunlap, 2001). Wolery and Dunlap (2001) emphasized the method in which these studies are described determine their utility to the field and interventions used with young children with disabilities and their families. Wolery's (2011) commentary on intervention research stated the following reasons to measure fidelity in intervention studies:

Measuring fidelity (a) potentially allows investigators to document findings were not due to lack of fidelity in a study; (b) presents information about how transportable interventions are to the real world; (c) provides information for replication studies; and (d) sheds light on the nature of children's experiences in the study. (p. 155)

Kaiser and Hemmeter (2013) indicated that precise measurement of fidelity received is important when analyzing individual child outcomes. A child may have received less quality or quantity of an intervention, which may have impacted results (Kaiser & Hemmeter, 2013).

Odom and Strain (2002) identified and reviewed 184 articles related to the Division of Early Childhood (DEC) Recommended Practices to examine the strength of scientific evidence for recommended practices. The authors found that 50% of the studies measured treatment fidelity of the independent variable. They also found that the degree of fidelity was quite high (Odom & Strain, 2002). Treatment fidelity is becoming more common in early intervention/early childhood special education research.

Documenting procedural fidelity allows researchers to make decisions about which interventions are effective. How can we systematically train teachers to implement strategies with fidelity? Treatment packages are one way to train educators. Although treatment packages have been successful in training educators, a component analysis would be required to determine which aspects of a package is most efficient.

Naturalistic Teaching Strategies

Early childhood professionals use a variety of interventions across all developmental domains. Milieu strategies or naturalistic teaching strategies are one type of language intervention commonly used in early childhood classrooms. Naturalistic teaching strategies occur in natural activities in a child's natural environment and are embedded throughout the day whenever opportunities arise (Collins, 2012). These embedded activities are of interest to the learner and are usually reinforced by a natural consequence (Collins, 2012).

One important aspect of naturalistic teaching strategies is responsive interaction. Two features of responsive interaction are nonverbal mirroring and verbal responding (Kaiser & Trent, 2008). This is a play-based intervention where the adult will follow the child's lead to facilitate reciprocal social interactions between the child and adult. The adult may imitate the child's nonverbal behavior to show interest in the activity and then respond verbally to model language at the target level (Kaiser & Trent, 2008). This strategy is basis of the mirroring and mapping strategy in this study.

Three naturalistic strategies were chosen for this study: (a) mirroring and mapping, (b) mand model, and (c) naturalistic time delay. Mirroring and mapping include imitating a child's nonverbal language and adding verbal language to the actions or materials (McCauley, 2017). Mand model procedure is prompting a child to use language with a non-yes/no question (Collins, 2012). Naturalistic time delay is when an educator pauses during a familiar routine or activity and waits for the child's response (Collins, 2012).

Enhanced Milieu Teaching (EMT) is another evidence-based naturalistic teaching strategy. EMT is a conversational-based teaching strategy that encourages naturalistic communication and enhances language in everyday routines. Kaiser, Roberts, Oetting & Loeb (2013) explain that EMT combines developmentally appropriate interactions with behavioral teaching to increase language outcomes. The strategies include: (a) arranging the environment; (b) teaching specific language targets that are developmentally appropriate; (c) responding to the child with prompts to elaborate language; and (d) reinforcing the child's expressive communication attempts (i.e., giving the child a requested object, continuing adult interaction, and confirming and expanding the

language used). Kaiser et al. (2013) found that when parents were trained to implement EMT strategies at home, child language outcomes increased.

A recent study examined the effects of blending EMT with joint attention, symbolic play, and emotional regulation in expressive language in children with Down syndrome. The authors found a functional relation between the intervention and the children's use of sign language. There was also an increase in verbalizations from the children, but it was not deemed a functional relation (Wright, Kaiser, Reikowsky, Roberts, & Oetting, 2013).

Lane et al. (2016) used a multiple baseline design across behaviors to determine whether a rapid coaching treatment package could increase the treatment fidelity of parent implementation of naturalistic strategies. The participants were two parent-child dyads. Both child participants had a diagnosis of autism and were 31-35 months old. Both parents were able to implement the strategies more effectively. More research is needed to determine if these behaviors are maintained over time.

Moore (2016) examined the effects of a training package on the treatment fidelity of EMT interventions implemented by early childhood educators with children with identified disabilities. A training package is a treatment package composed of different elements used to train a participant. Moore's training package included an initial workshop training and weekly ongoing coaching. She found that a functional relation existed between the training and treatment fidelity. The participants were not able to reach mastery with the workshop training alone. Furthermore, all teachers met criterion after the intervention.

Teacher Training

Teacher preparation programs largely focus on increasing teachers' knowledge and ability to use evidence-based practices in classrooms, however most teachers are not equipped to do so once they enter the work force (Myers, Sugai, Simonsen, & Freeman, 2017). Treatment packages are one way to train educators. The training package in the current study looked at a rapid training and rapid coaching model that included video models.

“Video modeling is a technique that involves demonstration of desired behaviors through video representation of the behavior. A video modeling intervention typically involves an individual watching a video demonstration and then imitating the behavior of the model” (Bellini & Akullian, 2007, pg. 266). The belief is that observers gain skills through watching the video and can replicate the behaviors more accurately. Bellini and Akullian's analysis of video modeling identifies Albert Bandura as a pioneer of this method (2007). The authors state that Bandura found observers could obtain skills through watching others perform the desired skills. He conducted an experiment to see if children would show more aggressive behavior after observing an aggressive model (Bandura, Ross, & Ross, 1961). This experiment showed a correlation and is replicable. These findings also support Bandura's (1977) Social Learning Theory, which is the theory that people learn from observing, imitating, and modeling other's behavior.

There are guidelines for evidence-based practices to assure they meet certain criterion. When working with the Council for Exceptional Children Division for Research (CEC-DR), Horner et al. (2005) outlined the criterion for evidence-based interventions; one being that the practice is implemented with fidelity (as cited in Bellini & Akullian,

2007). In the same article, the authors state video modeling is considered evidence-based under the CEC-DR criterion. Video modeling has effectively increases skill acquisition in children and these skills are generalized and maintained over time.

The advancement of technology brought video modeling into the classrooms setting. Video modeling has been successful in improving social communication in students with Autism Spectrum Disorder (ASD) (Mason, Rispoli, Ganz, Boles, & Orr, 2012). This intervention has shown to reduce some main characteristics of ASD (i.e., deficits in social communication, deficits in language). The goal of using video models with a student is the student will generalize the skills and begin to replicate the observed behavior.

In addition to using video modeling in the classrooms, researchers are now using video modeling to increase the treatment fidelity of their interventions. In one study, teachers attended a 60 min training class on how to implement intervention plans. After baseline data were collected, the teachers watched a video model of the same intervention. After the video, treatment fidelity increased for all implementers. (Digennaro-Reed, Coddling, Catania, & Maguire, 2010). Robinson (2007) found that when paraprofessionals were trained via video modeling, they implemented pivotal response treatment with improved fidelity. Additionally, they were more invested in implementation and reported satisfaction with the training.

Coaching is another way to increase skill acquisition of implementing interventions when training early childhood educators. Coaching is a crucial aspect of the treatment package. Performance feedback (PF) is the most common types of coaching in the literature. Noell et al (2005) defined PF as “monitoring a behavior that is the focus of

concern and providing feedback to the individual regarding that behavior” (as cited in Solomon, Klein, & Politylo, 2012, pg. 160). Solomon et al. (2012) conducted a meta-analysis on single case studies that examined if PF increased treatment integrity in school settings. The authors found that PF had a positive effect of the integrity of interventions. Moreover, the PF was slightly more effective for academic interventions than behavioral interventions.

Moore (2016) and Roberts et al., (2014) found that the most current research on teacher training packages to increase treatment fidelity in naturalistic teaching strategies. Moore (2016) examined the effects of training package on the treatment fidelity of EMT interventions implemented by early childhood educators with children with identified disabilities. Moore’s training package included an initial workshop training and weekly ongoing coaching. Moore’s training package did show a functional relationship with treatment fidelity of naturalistic language strategies.

Roberts, Kaiser, Wolfe, Bryant, and Spidalieri (2014) evaluated the Teach-Model-Coach-Review method of teaching caregivers EMT strategies. This method included a one-hour workshop, the interventionist modeling the interventions, coaching during the intervention session, and reviewing the intervention session. The study found caregivers increased application of EMT strategies and the children gained language skills. Although these finding support the Teach-Model-Coach-Review method, a component analysis is required to determine which parts of the instructional method is most effective. This study focused on rapid training, rapid coaching, and included video models in the training package. This could be a cost effective, efficient, and

technologically advanced way to train educators to deliver naturalistic teaching strategies with fidelity.

Purpose of the Study

The purpose of this study was to evaluate a multicomponent coaching intervention in increasing treatment fidelity of teacher implementation of naturalistic teaching strategies in an early childhood classroom. This study utilized a treatment package that included rapid training and rapid coaching sessions. Most training sessions last 45 minutes to one hour. The training sessions included in this study only lasted 15-20 min. The coaching sessions only lasted 1-2 min, as well. This rapid model could prove to be more efficient and practical for educators. This study added to the literature by measuring the fidelity of teacher implementation of strategies, as well as the specific treatment package to ensure treatment integrity of the independent variable. There is a lack of research in early childhood that report treatment integrity of the treatment package (Odom & Strain, 2002). Most of the research included participants that are two-five years old. This study added to the external validity and generalization of the findings in an early childhood classroom by using one-two year old children with communication delays.

This study evaluated the following research questions: Is there a functional relation between training early childhood teachers through a multicomponent coaching intervention and the increase in treatment fidelity of implementing naturalistic teaching strategies with children with communication delays? Secondly, when an adult provides an opportunity to communicate, within a naturalistic intervention session, will children respond to the adults by using expressive communication in the form of speech?

Chapter Two: Methods

Participants

Four participants were recruited for this study. To be included in this study, the teacher participants expressed interest in participating, agreed to partake in the treatment package, worked at least part time in an early childhood classroom as an assistant teacher, and were pursuing a degree in early childhood education. The participants could not be from another discipline or spend less than 15 hours a week in a child care setting. They could also not currently hold a degree in early childhood education. Demographic data were collected from each participant.

The teacher participants were told to choose a focus child who met the inclusion criteria for the study (i.e., had a delay in social communication). Each child's parents provided consent for the child to participate in the study. In order for children to participate in this study they had to be a student at a university laboratory school, were between the ages of 12 months and 35 months, had a history of attending 80% of school days over the past 60 days, and were below the cut-off in the area of social communication for his/her age on the Assessment, Evaluation, and Programming System for Infants and Children 2nd Edition (AEPS-2) or had a goal on their Individual Family Service Plan (IFSP) related to communication. The AEPS-2 is a curriculum referenced assessment tool used on children birth-6 in order to make informed decisions on their development. This tool is used for assessment, evaluation, program planning and progress monitoring. To be below the cut off score on this tool, suggests a delay in the area of development. This gives test users an indicator for further evaluating and possible

eligibility for special education services. Demographic data were collected on the children.

Dyad 1. Teacher 1 was a 26-year-old African American female pursuing a Bachelor's Degree in Interdisciplinary Early Childhood Education. She had 4 years of teaching experience and taught in a one-year-old room at a university laboratory school. Teacher 1 worked 30 hrs. a week. Child 1 was an 18-month-old boy receiving early intervention services. Child 1 attended the program 5 days a week, for around 8 hrs. a day. Child 1 had attended 90% of school days in the last 60 days. He received speech therapy, occupational therapy, and physical therapy. Child 1 did not have a medical diagnosis, but was eligible for special services under the category of Early Childhood Developmental Delay. The child had an IFSP goal of using 10 words or signs. The child could indicate wants and needs by pointing and vocalizing, but did not use words or signs to communicate.

Dyad 2. Teacher 2 was a 22-year-old African American female pursuing her Bachelor's Degree in Interdisciplinary Early Childhood Education. She had 3 years of teaching experience and taught in a 2 yr old room at the university laboratory school. Teacher 2 worked 40 hrs a week. Child 2 was a 28-month old Caucasian boy. He did not receive any special services, but was below the cut-off score in the area of social communication according to the AEPS-2, which suggests a delay in the area. He had a score of 10 in the area of social communication and the cut off score was 12. He had attended 95% of school days in the last 60 days.

Setting

Sessions were held at a university laboratory school. There were 80 children enrolled in the entire school. The school was accredited by the National Association for the Education of Young Children (NAEYC) and was rated 4 out of 5 stars by STARS for KIDS NOW, a quality rating improvement system for licensed child care facilities. This indicated a highly ranked environment for children that goes beyond licensing requirements.

There were two classrooms involved in this study. The classroom of Dyad 1 had six children with two-three workers. For Dyad 2, the classroom had 14 children with three-five workers. The classrooms shared the following characteristics: (a) the daily schedule consisted of free play time, gross motor time, meal times, and nap time; (b) the program operated Monday through Friday 7:30-5:30; (c) the room was arranged as a typical day care room, with child sized furniture and developmentally appropriate toys (e.g., blocks, dolls, toy cars, dolls, books); (d) materials and toys were switched out frequently; (e) the interventions took place using materials and toys available in the classroom at that specific time.

Materials

Technology. Various forms of technology were used to create the treatment package and during the intervention.

Video models. Video models were created using the PhotoBooth application on a 2010 model 13 in MacBook Pro laptop. The video models were edited on a MacBook Pro computer with the iMovie software. The videos demonstrated an adult implementing mirroring and mapping, mand model procedure, and naturalistic time delay. The

researcher and another adult demonstrated the behaviors in the video. Video models were completely confidential and only available to the researcher and the teacher during trainings.

Stopwatch application. A stopwatch application on an iPhone 6S Plus was used to time the 4 min sessions.

PowerPoint. A PowerPoint was created for the booster training session. This PowerPoint covered the three targeted strategies: mirroring and mapping, mand model procedures, and naturalistic time delay. The 15 slide PowerPoint included: (a) the purpose of naturalistic teaching strategies; (b) when you would use them; (c) outline of the three strategies; (d) examples of the strategies; (e) video models of the strategies; (f) and discussion questions about the strategies.

Teacher Perception Survey. The teacher perception survey was created using SurveyMonkey®.

Classroom materials. As reported above, classroom materials changed periodically. The teachers used any classroom materials that the children were interested in during implementation. Some examples of classroom materials included playdoh, crayons, toy dolls, or toy cars.

Data Collection

Data were collected on the teacher's behaviors, the child's behaviors, and the teacher's perception of the independent variable. Teacher behaviors included correct implementation of naturalistic strategies during sessions with the participant (i.e., dependent variable). The child's behaviors included the child language outcomes. Also,

the teacher's perception of the independent variable was measured using the teacher's perception survey.

Each session lasted four minutes. The researcher conducted two sessions a day, four days a week. During all conditions, the researcher collected data during the session using a checklist. The researcher prompted the participants by saying, "Work with (child's name) on their expressive communication". The researcher started a stopwatch application directly after this prompt. The researcher placed a checkmark next to the steps the teacher completed correctly within the four minutes. The researcher also collected data using a checklist on the frequency of vocalizations during the session for secondary outcomes.

Teacher Behaviors

Mirroring and mapping. Correct mirroring and mapping (See Appendix C) included the participant noticing the child engaging in an activity, imitating the child's nonverbal behaviors with the same or similar materials, and modeling language at the target language level (i.e., nouns, protoverbs, requesting words) (McCauley, 2017). For example, a meaningful teaching episode included a child feeding a baby doll and the teacher then feeding a baby doll and saying, "feed the baby".

Mand model. Correct mand modeling (See Appendix D) involved (a) the teacher noticed the child needs to communicate, (b) the teacher approached the student, (c) if the student initiated correct response, teacher reinforced the student, (e.g., gave the child the toy they wanted with verbal praise, "Yes! Here's your ball!"), (d) if the student did not initiate a response, teacher provided a mand (i.e., a non-yes/no question) related to the activity, (e) the teacher allowed the student time to respond (e.g., 4 seconds), (f) if the

student made a correct response (i.e., responded with an appropriate response to the stimuli with a vocalization or verbalization), the teacher praised the student and allowed them to continue the activity, (g) if the student made no response or an incorrect response (i.e., responded with vocalization or verbalization obviously unrelated to stimuli), the teacher prompted the student to respond correctly by modeling the correct language (Collins, 2012). An example of a meaningful teaching episode using the mand model was a child looked towards a car on the shelf. The teacher noticed, approached the child, and then interrupted the child and asked, “What do you want?” and the child replied, “car”. The teacher then delivered praise and allowed the child to continue with the activity.

Time delay. A correct time delay episode (See Appendix E) included the following: (a) during a familiar routine or activity the teacher interrupted the activity when there was an opportunity to require student to communicate, (b) teacher paused for 4 seconds, (c) teacher allowed child to respond, (d) depending on child’s response, participant responded with praise and gave child what they want or used an appropriate prompt and provoked the correct response, (e) If the child provided a correct response, the teacher praised the student and gave them the desired materials or assistance (e.g., if child says, “milk” the teacher praised the child and gave them more milk), (f) If the child did not respond or used an incorrect response, the teacher modeled the correct language and gave them desired materials or assistance. Student responses varied and were classified by the following: correct response (i.e., verbalization or vocalization to obtain wants or needs), incorrect response (i.e., unrelated verbalization or vocalization), or no response (Collins, 2012). For example, during mealtime the teacher noticed that the child

needed more snack. The teacher held the snack over the table while looking at the child expectantly. The teacher paused for four seconds and the child said, “more snack”. The teacher then praised the student and gave them more food.

Child Language Outcomes

Data on child language outcomes were collected by the researcher using a data sheet during the four minute sessions. The measure was a frequency count of vocalizations from the child. A vocalization was operationally defined as any utterance or sound from the child’s mouth that was not a cry or scream. Examples of vocalizations included (a) babbling (i.e., ba-ba, da-da), (b) mumbling (i.e., mmm, hmm), (c) words (i.e., ball, mama). A non-example was a child crying or screaming (utterance loud enough to be heard 50 feet away) to express distress. This was then used to calculate a percentage of responses per adult given opportunity. For example, if the child vocalized once and the teacher attempted a naturalistic strategy once, the child responded 100% of opportunities. If the child did not vocalize and the teacher attempted the strategy three times, the child responded 0% of opportunities.

Teacher Perception Survey

The teacher perception survey was conducted after the participant reached criterion on all three naturalistic strategies (see Appendix G). The survey allowed the researcher to assess if procedures and outcomes of the study were considered socially valid by practitioners in the field. Seven items regarded the value of the treatment package, the value of the naturalistic teaching strategies, and how practicable the strategies were in an applied setting. Teachers rated statements strongly agree, agree, neutral, disagree, or strongly disagree.

Procedures

Probe. During the initial probe condition the researcher told the participant to “Work with (child’s name) on their expressive communication”. The researcher did nothing except collected data on the treatment fidelity of the teacher’s implementation of the naturalistic teaching strategies and the child language outcomes for the four-minute session (see Appendix C, D, E, & F for data collection sheets). The participants had no training prior to baseline and used materials present in the classroom. For the first tier, the initial probe condition lasted for four sessions to ensure a stable data trend. For subsequent tiers, probes were collected throughout the study.

Training Sessions

After at least four initial probe sessions occurred, the researcher conducted an individual training session with each participant on the first target naturalistic teaching strategy. Each training sessions included the following components:

- a) Researcher begins by greeting the participant.
- b) Researcher provides purpose of study.
- c) Researcher goes over outline of the naturalistic strategies.
- d) Researcher presents video model to participants.
- e) Researcher goes over examples and non-examples of naturalistic strategies.
- f) Researcher asks participants if they have any questions.

Treatment fidelity of the training sessions was collected by the researcher (see Appendix F). A second observer also collected data on one training session for each participant using the same data sheet. The training sessions were held in a conference room at the university laboratory school. Training sessions took around 15-20 minutes.

During the trainings, the researcher began by greeting the participant and going over the purpose of the study. The researcher then presented materials that included an outline of the strategy, a video model depicting the strategy, and a list of examples and non-examples. The researcher gave feedback on any examples or questions they had. The first training was on mirroring and mapping. The other two strategies were taught during trainings after the participants reached criterion on the previous target strategy. Each participant received a total of three separate training sessions in a time-lagged fashion.

Intervention

During the intervention phase, short coaching sessions occurred before the participant implemented the strategies in the classroom. During this short session (1-2 minutes), the researcher went over examples and non-examples of the naturalistic strategy. The researcher then asked the participant if they had any questions.

Next, the researcher told the participant to “Work with (child’s name) on their expressive communication”. The researcher collected data on the treatment fidelity of the teacher’s implementation of the naturalistic teaching strategies and the child language outcomes for the 4 min session (see Appendix C, D, E, & F). After the four-minute session, the researcher provided specific feedback on performance and suggestions for when they could have used the strategies. Once the participant reached the criterion-level for responding, which was correctly implementing 100% of attempted steps for three consecutive sessions, the second intervention phase began. Once the participant had reached criterion-level for responding on the second behavior, the third intervention phase began.

Booster training. After the three interventions were mastered, a booster training was conducted to train the participants on the three strategies. The participants mastered the skills quickly after the training and coaching phase began, however once the next tier of intervention began the teachers returned to initial probe levels of responding for the previous tier. They were not maintaining the targeted skills once the next intervention began. The booster training was similar to the previous three trainings, but different in that it included a PowerPoint and discussion summarizing all three strategies. Two to three sessions took place after the training to evaluate if participants could complete 100% of steps for all three strategies within a four-minute session. These sessions allowed the researcher to collect additional maintenance data.

Maintenance Probe Sessions

Once a tier was mastered, maintenance probe sessions were conducted and were identical to probe conditions. Maintenance data were collected at least once every two weeks on behaviors that have met criterion level for responding.

Interobserver Agreement and Procedural Fidelity

Interobserver Agreement (IOA) data were collected using point-by-point agreement. Mean IOA agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. For both dyads, the second observer coded at least 20% of sessions in each condition. For Dyad 1, the mean agreement for teacher behaviors was 98% (range= 92%-100%). The mean agreement for child behaviors for Dyad 1 was 100% with zero disagreements. For Dyad 1, IOA was above 80% for both teacher and child behaviors. For Dyad 2, the mean agreement for teacher behaviors was 97% (range= 80%-100). The mean agreement for

child behaviors was 81%(range= 13%-100). For Dyad 2, IOA was at or above 80% for all teacher behaviors, but was below 80% for child behaviors (13%).

Procedural fidelity data were collected on the three initial training sessions and the booster training session. The researcher greeted the participant, provided purpose of the study, went over outline of the strategy, presented a video model, went over examples and non-examples, and asked if the participants had any questions for 100% of the training sessions for both dyads. The second observer also coded procedural fidelity on one training session for each participant, which accounts for 25% of training sessions.

Procedural fidelity was also collected on at least 20% of the sessions in each condition by the second observer. The researcher conducted both probe and intervention sessions with 100% fidelity. The second observer collected procedural fidelity on the initial probe sessions after the sessions occurred. The rest of the data were collected during the four-minute session.

Experimental Design

A multiple probe design across behaviors (Gast & Ledford, 2014) replicated across participants was used in this study. Three behaviors that were functionally similar yet independent from one another were selected for this study. Baseline logic was used to determine whether the introduction of the independent variable in a time lagged fashion over three behaviors was functionally related to the dependent variable (i.e., fidelity of implementation by teacher). Once the intervention was introduced there was a change in the level and stability of the data. If intervention did not occur, the data would stay similar to initial probe levels.

Intra-subject replication increased the internal validity of this study. Also, inter-subject replication added to the external validity. This design controls for threats to internal validity. Testing threats were not a concern due to the intermittent probe, instead of a consistent baseline. Also, maturation threats were not a concern due to the short duration of the study. Also, child behaviors were collected within the context of a multiple probe design, but decisions about when to change conditions was based on performance of the teacher.

Chapter Three: Results

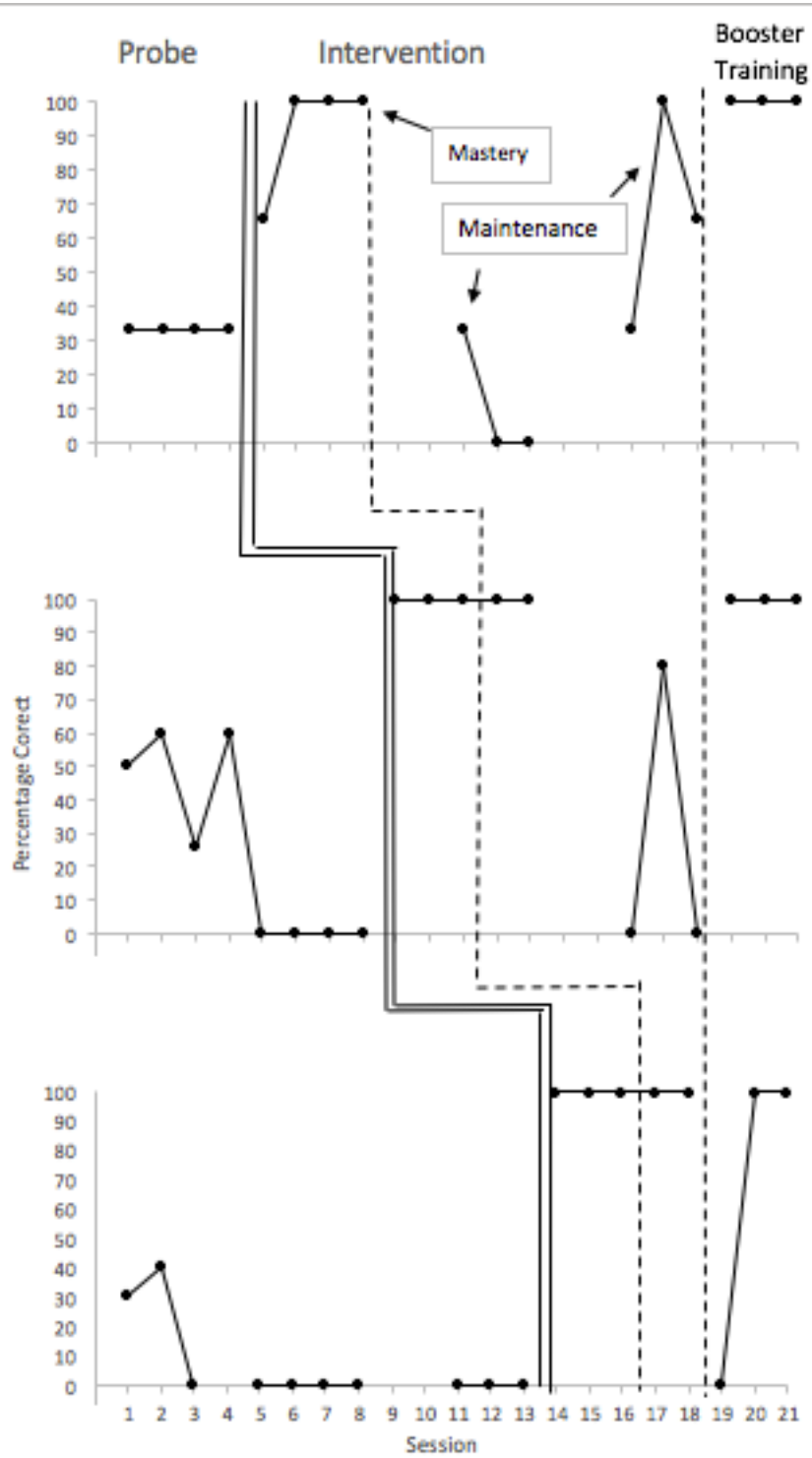
Dyad 1

Teacher behaviors. Stability, trend, and level change were the focus of the visual analyses of the results. During the initial probe condition, Teacher 1 exhibited some of the target behaviors (range= 0-60%), but was not close to criterion for mastery. For mirroring and mapping, Teacher 1 completed 33% of the steps correctly for four sessions. Teacher 1 noticed the child participating in an activity, but did not imitate nonverbal language or model target language. During the initial probe condition, Teacher 1 exhibited 0-60% of steps for mand model procedure for four baseline sessions. She would approach the student and deliver a mand, but did not allow the child time to respond or give the correct consequence for the child's responses. Teacher 1 completed 0-40% of the steps for three sessions for naturalistic time delay. She allowed the child to respond to questions, but did not give the expectant look or give the correct consequence for the child's responses.

After the training for tier 1, the teacher's responses accelerated in a therapeutic direction. There was an immediate absolute change of 33% correctly implemented steps.

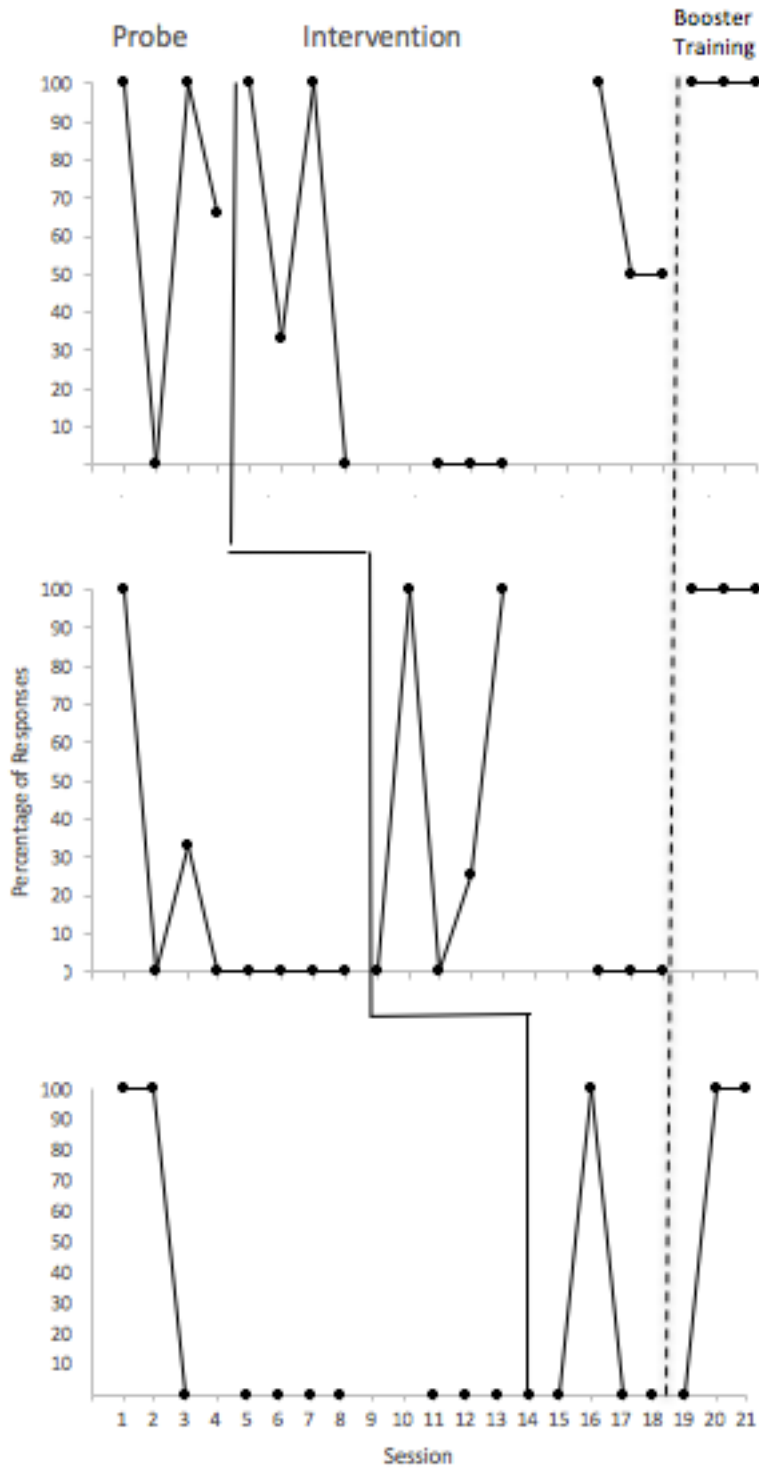
By the next session, session 6, the participant had reached 100% unprompted correct responding and had reached criterion for mastery by the 8th session. After the subsequent training for tier 2, the participant responses had an absolute level change of 100% after the training for mand model procedure. The same results came from the third and last training. The teacher went from 0% to 100% correct responses. Between all A and conditions there was an immediate and abrupt change in level and trend, with data stabilizing at 100%. There was no overlap (POD=0%; PND=100%). Visual analysis also shows a consistency of effect on all three tiers. Teacher 1 met criterion for mastery in all three tiers of intervention, however, they quickly returned to 0% after the subsequent tier was introduced. In tier 1, the teacher returned to initial probe levels (33%) before decelerating to 0%. After the booster training, Teacher 1 correctly implemented 61% of the steps for all three strategies. She did not attempt to implement naturalistic time delay, due to running out of time in the session. Teacher 1 completed 100% of the steps for all three interventions for the next two sessions.

Figure 2.1. Percentage of Correct Responses for Teacher 1



Child behaviors. During the initial probe condition, Child 1 responded by vocalizing an average of 66% of opportunities (range= 0-100%) given by the adult. After the first intervention the data were similar initial probe levels. Probe and maintenance data decelerated to 0% responding once a tier of intervention was introduced. There was no trend or stability in the data, however, after the booster training the child responded to 100% of opportunities for two sessions.

Figure 2.2. Percentage of Responses for Child 1

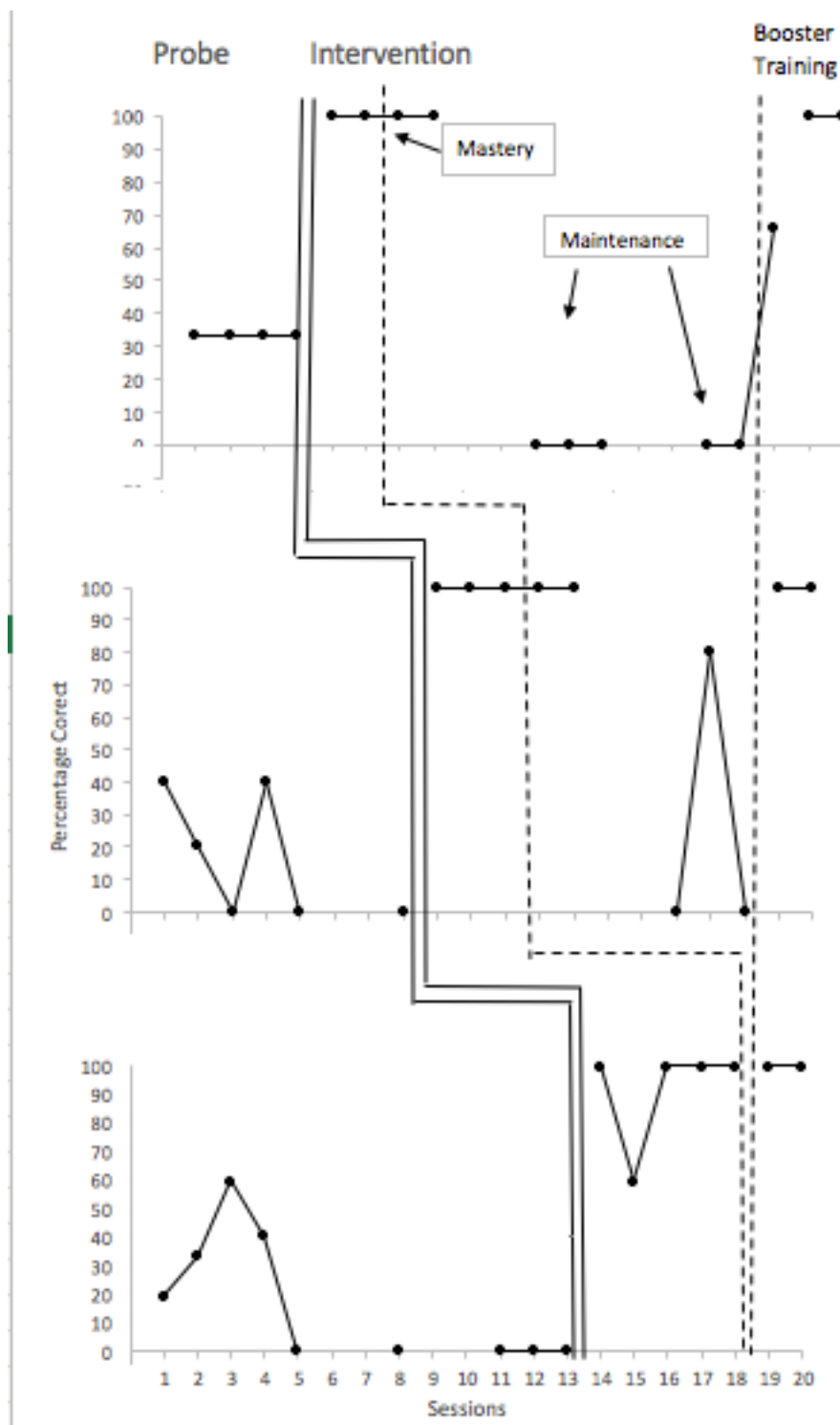


Dyad 2

Teacher behaviors. During the initial probe condition, Teacher 2 correctly implemented one of the steps correctly (33%) for mirroring and mapping. She noticed the child participating in an activity, but did not imitate the child's nonverbal behavior or model target language outcomes. Teacher 2 averaged 25% correctly steps (range= 0%-40%) for the mand model procedure during the four initial probes. She noticed the child engaged and approached the student, but did not deliver a mand or deliver the correct consequences dependent on the child's responses. Teacher 2 averaged 38.3% correct steps (range= 20%-60%) of the naturalistic time delay procedure for the first four probes. She consistently allowed the child to respond and once stopped a familiar activity and delivered an expectant look to the child.

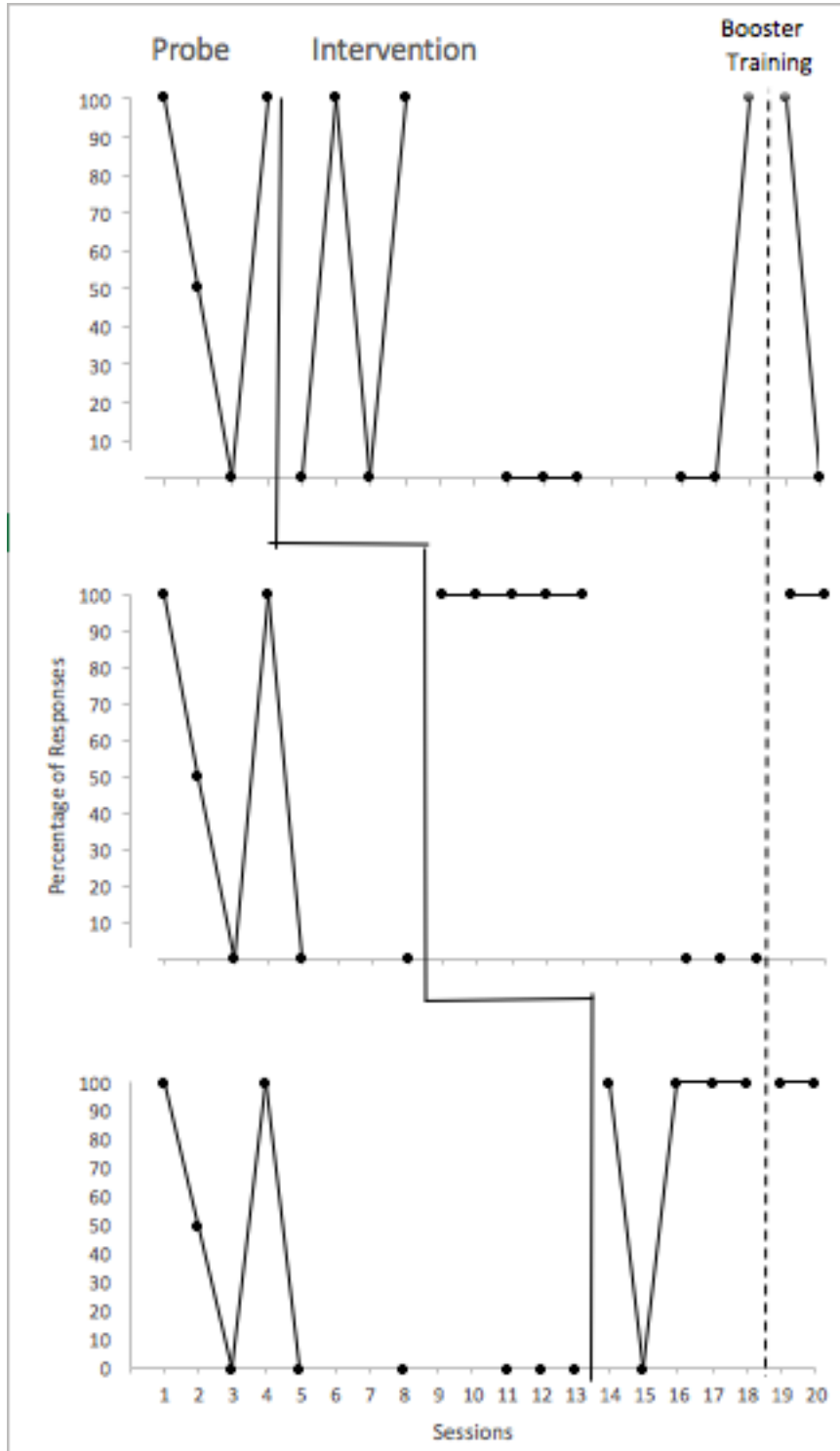
After the trainings, Teacher 2 accelerated in a therapeutic direction and went straight to correctly implementing 100% of steps for all three strategies. During the second session after the naturalistic time delay intervention, the teacher did decelerate to 60% steps completed correctly. During this session, she did not pause or allow the child to respond. After the next coaching session, however, she went back to 100% and reached criterion for mastery. Teacher 2 did not maintain the criterion for mastery once the subsequent interventions were introduced. She did maintain some behaviors, but it was variable and below 80%. After the booster training, Teacher 2 had an absolute level change of 100 and completed 100% of all the steps for all three strategies for two sessions. There was a functional relation between the variables. Between all A and conditions there was an immediate and abrupt change in level and trend, with data stabilizing at 100%. There was no overlap (POD=0%; PND=100%).

Figure 2.3. Percentage of Correct Responses for Teacher 2



Child behaviors. During the initial probe sessions, the child responded with a vocalization an average of 66% of opportunities (range= 0-100%) given by the adult. These results were the same for the initial probe data for the second and third tier. After tier 2 intervention was introduced, the child responded to 100% of opportunities given by an adult with a vocalization. However, probe and maintenance data decelerated to responding 0% of opportunities. Immediately following the introduction of the intervention, the child showed more responses via vocalization. Data were also stable following third session after tier 3. Child data were variable, but some trends suggest more stable responses after intervention occurred.

Figure 2.4. Percentage of Responses for Child 2



Chapter Four: Discussion

The purpose of this study was to evaluate a multicomponent coaching intervention for training teachers to correctly implement naturalistic teaching strategies in an early childhood classroom. The targeted skills were mirroring and mapping, mand model procedure, and naturalistic time delay. Secondly, this study assessed if child language outcomes improved with the increase of adult given opportunities to respond using naturalistic language strategies. The data indicated that the coaching intervention was effective in training the participants to correctly implement the strategies. Both of the teachers reached criterion for mastery on all three targeted skills. However, a booster training was required at the end of the experiment to assist teachers in maintaining and coordinating the targeted skills within a single session.

Child language outcomes were variable; however, this could be due to the manner in which data were collected. Child vocalizations were only collected during an attempt of a meaningful teaching episode. Child outcomes did increase when looking at responding rates per opportunity. Child data became more stable and the child responded more with vocalizations after the interventions and adult given opportunities occurred. This is a demonstration of the responsive interaction aspect of naturalistic teaching strategies. The child responded more once the adult implemented the strategies correctly. Although there was a trend in child language data, the researcher did not have experimental control over the child behaviors.

The current study adds to the current literature by utilizing rapid training and rapid coaching sessions. Most training sessions last 45 minutes to one hour, however, the training sessions in this study only lasted 15-20 minutes. The rapid coaching sessions

only lasted 1-2 minutes. This model could prove to be more efficient and practical. Lane et al., (2016) found that a rapid coaching model was successful in training parents to use naturalistic strategies with their children.

This study also adds to the literature by reporting the treatment fidelity of the coaching intervention. There is a lack of research in early childhood that report treatment integrity of the treatment package (Odom & Strain, 2002). Most of the previous research included participants that are two-five years old. Finally, this study added to the external validity and generalization of the findings in an early childhood classroom by using one-two year old children with communication delays.

Moore (2016) and Roberts et al., (2014) conducted research on teacher/caregiver preparation. Moore (2016) examined the effects of training package on the treatment fidelity of EMT interventions implemented by early childhood educators with children with identified disabilities. Moore's training package included an initial workshop training and weekly ongoing coaching. Moore's training package did show a functional relationship with treatment fidelity of naturalistic language strategies. Roberts, et al., (2014) evaluated the Teach-Model-Coach-Review method of teaching caregivers EMT strategies. This method included a one-hour workshop, the interventionist modeling the interventions, coaching during the intervention session, and reviewing the intervention session. The study found caregivers increased application of EMT strategies and the children gained language skills.

Results show that the participants were able to demonstrate some of the targeted behaviors during the initial probe. This is to be expected from this population. When prompted to work on communication, the educators would often deliver a mand or ask

the child to label an object. However, once the first tier of intervention began, the teachers did not exhibit any of the targeted behaviors for the other two tiers. The author credits this to the participants attempting to execute the targeted skill only. For example, during the initial probe sessions the participants would often deliver a mand (e.g., “What’s this? What color is this?”) or pause to let the child respond. Once the mirroring and mapping intervention took place, the participants simply modeled the nonverbal behavior and added target language.

Social validity was measured using the Teacher Perception Survey (See Appendix E). Both teachers rated the seven items as strongly agree (100%). The results indicate that both teachers found the strategies useful and beneficial for their students. Both teachers reported being highly satisfied with their trainings, as well as with the video models and performance feedback before and after sessions. The survey results indicate the teachers will continue to use these strategies in their classrooms.

Implications

The results show that a multicomponent coaching intervention may be effective in training early childhood educators to use naturalistic language strategies with children who have social communication delays. This coaching intervention included rapid training sessions, which are both efficient and effective in training educators. Trainings and classes are expensive. This research could have implications for training educators in a way that is more feasible, especially when conducting sessions in typical environments such as classrooms.

Some early childhood teachers working with young children do not have a degree in early childhood (Saluja, Early, & Clifford, 2002). It is crucial to find a way to train

these educators on best practice. Rapid training and coaching sessions would help these educators better improve children's long term outcomes. Implementing evidence-based practices with fidelity is important and powerful in improving child outcomes. It is urgent that we are training early childhood educators in a way that will allow them to apply evidence-based strategies in real life situations.

Limitations

Although there was a functional relation found between variables, there is a limitation to this study. Adequate probe data were not collected before implementing the second intervention with dyad 2. Only one probe session occurred immediately before implementing the second intervention, however the probe session did show a similar trend as the initial probe data and the behaviors could not have been learned without direct instruction.

Future Research

Future studies might include a reminder for participants to continue usage of the previous skills once the subsequent skills are introduced. This could assist in maintenance. Also, future studies should be conducted on larger sample sizes and varying populations. The teachers in this study were working towards their bachelor's degree in early childhood education. It is important to see if these results are replicable with teachers who are not pursuing a degree in early childhood education. Some teaching assistants' may only have a high school degree. It would also be beneficial to replicate this study across populations with varying socioeconomic statuses. This would add to the external validity of these findings. Future research could use this coaching intervention to teach other types of teacher skills, such as behavior support skills, or academic skills.

Although this research did not utilize a web-based coaching intervention, it is the researchers hope that this study will give insight on how to train educators around the world. Impoverished countries have children that we need to reach. These countries have educators that want to improve outcomes for their children, but do not have the resources needed. If we combine this rapid, multicomponent coaching intervention, video models, and web-based coaching, we could train more educators around the world. Future studies should combine these teacher preparation strategies with a web-based coaching model.

APPENDIX A

Consent to Participate in a Research Study for Child Participants

Effects of a Coaching Intervention on Teacher's Implementation of Naturalistic Strategies to Promote Communication in Children

WHY ARE YOU BEING INVITED TO TAKE PART IN THIS RESEARCH?

You are being invited to take part in a research study about teachers using naturalistic language strategies to promote language in young children. Naturalistic language strategies are language strategies that teachers can use in the child's natural environment. In this study, the natural environment will be the classroom. These strategies are used during daily routines such as snack time or free play time. The teacher may ask the child a question or wait for the child to communicate. One example of this could involve the teacher noticing the child needs more crackers at snack time. Instead of the teacher giving the child more food right away, the teacher may ask the child, "What do you want?" If the child still does not respond, the teacher would model the correct response by saying, "Cracker. You want a cracker." and give the child more crackers. Your child is being asked to participate because he or she displays a delay in the area of social communication. If you agreed that your children can take part in this study, he or she will be one of two children to do so.

WHO IS DOING THE STUDY?

The person in charge of this study is Kaitlin Dick of University of Kentucky Department of Early Childhood, Special Education, and Rehabilitation Sciences. She is being guided in this research by Jennifer Grisham-Brown, a professor in the University of Kentucky Department of Early Childhood, Special Education, and Rehabilitation Sciences. There may be other people on the research team assisting at different times during the study.

WHAT IS THE PURPOSE OF THIS STUDY?

By doing this study, we hope to learn whether a multicomponent coaching intervention will assist early childhood educators in using naturalistic language interventions correctly in the classroom. We will also assess if child language outcomes increase as the teachers implement these strategies with fidelity.

ARE THERE REASONS WHY YOU SHOULD NOT TAKE PART IN THIS STUDY?

There are no known negative effects if you and your child participate in this study. Standard instructional procedures will be used that are proven to be successful with other children.

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST?

The research procedures will be conducted at the UK Early Childhood Lab. Each session will take about 4 minutes. Sessions will be conducted 5 days per week for no more than 4 months.

WHAT WILL YOU BE ASKED TO DO?

Your child will be encouraged to communicate throughout their daily routines at school. Your child's teacher will use naturalistic language strategies to prompt your child to communicate.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?

To the best of our knowledge, the things your child will be doing have no more risk of harm than he or she would experience in everyday life.

WILL YOU BENEFIT FROM TAKING PART IN THIS STUDY?

There is no guarantee that your child will get any benefit from taking part in this study. However, some children have experienced increases in expressive communication when instructors use naturalistic language strategies correctly. Your willingness to let your child take part may, in the future, help society as a whole better understand this research topic.

DO YOU HAVE TO TAKE PART IN THE STUDY?

If you decide to let your child take part in the study, it should be because you really want to volunteer. Your child will not lose any benefits or rights he or she would normally have if you choose not to volunteer. Your child can stop at any time during the study and still keep the benefits and rights he or she had before volunteering.

IF YOU DON'T WANT TO TAKE PART IN THE STUDY, ARE THERE OTHER CHOICES?

If you do not want your child to be in the study, there are no other choices except not to take part in the study.

WHAT WILL IT COST YOU TO PARTICIPATE?

There are no costs associated with taking part in the study.

WILL YOU RECEIVE ANY REWARDS FOR TAKING PART IN THIS STUDY?

You and your child will not receive any rewards or payment for taking part in the study.

WHO WILL SEE THE INFORMATION THAT YOU GIVE?

We will make every effort to keep confidential all research records that identify you to the extent allowed by law.

Your information will be combined with information from other people taking part in the study. When we write about the study to share it with other researchers, we will write about the combined information we have gathered. You will not be personally identified in these written materials. We may publish the results of this study; however, we will keep your name and other identifying information private.

We will make every effort to prevent anyone who is not on the research team from knowing that you gave us information, or what that information is. Only initials or a fictitious name will be used

to identify your child during the study and data will be stored in the office of Dr. Jennifer Grisham-Brown at the University of Kentucky.

We will keep private all research records that identify you to the extent allowed by law. Also, we may be required to show information which identifies you to people who need to be sure we have done the research correctly; these would be people from the University of Kentucky.

CAN YOUR TAKING PART IN THE STUDY END EARLY?

If you decide to let your child take part in the study you still have the right to decide at any time that you no longer want he or she to continue. Your child will not be treated differently if you decide he or she should stop taking part in the study.

The individuals conducting the study may need to withdraw your child from the study. This may occur if your child misses too many days or masters the material related to the study.

ARE YOU PARTICIPATING OR CAN YOU PARTICIPATE IN ANOTHER RESEARCH STUDY AT THE SAME TIME AS PARTICIPATING IN THIS ONE?

Your child may take part in this study if you are currently involved in another research study. It is important to let the investigator know if your child is in another research study. You should also discuss with the investigator before you agree to participate in another research study while your child is enrolled in this study.

WHAT IF NEW INFORMATION IS LEARNED DURING THE STUDY THAT MIGHT AFFECT YOUR DECISION TO PARTICIPATE?

If the researcher learns of new information in regards to this study, and it might change your willingness to stay in this study, the information will be provided to you. You may be asked to sign a new informed consent form if the information is provided to you after you have joined the study.

WHAT ELSE DO YOU NEED TO KNOW?

There is a possibility that the data collected from you may be shared with other investigators in the future. If that is the case the data will not contain information that can identify you unless you give your consent or the UK Institutional Review Board (IRB) approves the research. The IRB is a committee that reviews ethical issues, according to federal, state and local regulations on research with human subjects, to make sure the study complies with these before approval of a research study is issued.

WHAT IF YOU HAVE QUESTIONS, SUGGESTIONS, CONCERNS, OR COMPLAINTS?

Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions, suggestions, concerns, or complaints about the study, you can contact the investigator, Katie Dick at 606-425-1576 or Dr. Jennifer Grisham-Brown at 859-257-8943 or email at Jennifer.grisham-brown@uky.edu. If you have any questions about your rights as a volunteer in this research, contact the staff in the Office of Research Integrity at the University of Kentucky between the business hours of 8am and 5pm EST, Mon-Fri. at 859-257-9428 or toll free at 1-866-400-9428. We will give you a signed copy of this consent form to take with you.

Signature of person agreeing to take part in the study

Date

Printed name of person agreeing to take part in the study

Name of (authorized) person obtaining informed consent

Date

APPENDIX B

Consent to Participate in a Research Study for Teacher Participants

Effects of a Coaching Intervention on Teacher's Implementation of Naturalistic Strategies to Promote Communication in Children

WHY ARE YOU BEING INVITED TO TAKE PART IN THIS RESEARCH?

You are being invited to take part in a research study about teachers using naturalistic language strategies to promote language in young children. Naturalistic language strategies are practices that include manipulating the child's environment and responsive intervention techniques to promote the development and use of language skills. These strategies are naturalistic because they can be used across settings and throughout daily routines with children. You are being asked to participate because you are pursuing an undergraduate degree in early childhood education and are currently working at least part time at the UK Early Childhood Laboratory. If you volunteer to take part in this study, you will be one of two people to do so.

WHO IS DOING THE STUDY?

The person in charge of this study is Kaitlin Dick of University of Kentucky Department of Early Childhood, Special Education, and Rehabilitation Sciences. She is being guided in this research by Jennifer Grisham-Brown, a professor in the University of Kentucky Department of Early Childhood, Special Education, and Rehabilitation Sciences. There may be other people on the research team assisting at different times during the study.

WHAT IS THE PURPOSE OF THIS STUDY?

By doing this study, we hope to learn whether a multicomponent coaching intervention will assist early childhood educators in using naturalistic language interventions correctly in the classroom. We will also assess if student language outcomes increase as the teachers implement these strategies with fidelity.

ARE THERE REASONS WHY YOU SHOULD NOT TAKE PART IN THIS STUDY?

There are no known negative effects if you participate in this study other than those encountered in day-to-day life.

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST?

The research procedures will be conducted at the UK Early Childhood Lab. You will participate in three 30 to 45-minute training sessions in the conference room. After the trainings, sessions inside the classroom will take about 6 minutes to complete. Sessions will be conducted 5 days per week for no more than 4 months.

WHAT WILL YOU BE ASKED TO DO?

During the training sessions, you will be asked to watch a short video and participate in a one on one training session with the researcher. During the sessions in the classroom, you will be asked to work on communication skills with a focus student for a short amount of time.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?

To the best of our knowledge, the things you will be doing have no more risk of harm than you would experience in everyday life.

WILL YOU BENEFIT FROM TAKING PART IN THIS STUDY?

There is no guarantee that you will get any benefit from taking part in this study. However, some people have experienced increased ability to implement naturalistic language strategies in the classroom when trained using a multicomponent coaching intervention to do so. Your willingness to take part, however, may, in the future, help society as a whole better understand this research topic.

DO YOU HAVE TO TAKE PART IN THE STUDY?

If you decide to take part in the study, it should be because you really want to volunteer. You will not lose any benefits or rights you would normally have if you choose not to volunteer. You can stop at any time during the study and still keep the benefits and rights you had before volunteering.

IF YOU DON'T WANT TO TAKE PART IN THE STUDY, ARE THERE OTHER CHOICES?

If you do not want to be in the study, there are no other choices except not to take part in the study.

WHAT WILL IT COST YOU TO PARTICIPATE?

There are no costs associated with taking part in the study.

WILL YOU RECEIVE ANY REWARDS FOR TAKING PART IN THIS STUDY?

You will not receive any rewards or payment for taking part in the study.

WHO WILL SEE THE INFORMATION THAT YOU GIVE?

We will make every effort to keep confidential all research records that identify you to the extent allowed by law.

Your information will be combined with information from other people taking part in the study. When we write about the study to share it with other researchers, we will write about the combined information we have gathered. You will not be personally identified in these written materials. We may publish the results of this study; however, we will keep your name and other identifying information private.

We will make every effort to prevent anyone who is not on the research team from knowing that you gave us information, or what that information is. Only initials or a fictitious name will be used to identify you and your student during the study and data will be stored in the office of Dr. Jennifer Grisham-Brown at the University of Kentucky.

We will keep private all research records that identify you to the extent allowed by law. Also, we may be required to show information which identifies you to people who need to be sure we have done the research correctly; these would be people from the University of Kentucky.

CAN YOUR TAKING PART IN THE STUDY END EARLY?

If you decide to take part in the study you still have the right to decide at any time that you no longer want to continue. You will not be treated differently if you decide to stop taking part in the study.

The individuals conducting the study may need to withdraw you from the study. This may occur if you decide to quit working at the UK Early Childhood Lab or miss too many days.

ARE YOU PARTICIPATING OR CAN YOU PARTICIPATE IN ANOTHER RESEARCH STUDY AT THE SAME TIME AS PARTICIPATING IN THIS ONE?

You may take part in this study if you are currently involved in another research study. It is important to let the investigator/your doctor know if you are in another research study. You should also discuss with the investigator before you agree to participate in another research study while you are enrolled in this study.

WHAT IF NEW INFORMATION IS LEARNED DURING THE STUDY THAT MIGHT AFFECT YOUR DECISION TO PARTICIPATE?

If the researcher learns of new information in regards to this study, and it might change your willingness to stay in this study, the information will be provided to you. You may be asked to sign a new informed consent form if the information is provided to you after you have joined the study.

WHAT ELSE DO YOU NEED TO KNOW?

There is a possibility that the data collected from you may be shared with other investigators in the future. If that is the case the data will not contain information that can identify you unless you give your consent or the UK Institutional Review Board (IRB) approves the research. The IRB is a committee that reviews ethical issues, according to federal, state and local regulations on research with human subjects, to make sure the study complies with these before approval of a research study is issued.

WHAT IF YOU HAVE QUESTIONS, SUGGESTIONS, CONCERNS, OR COMPLAINTS?

Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions, suggestions, concerns, or complaints about the study, you can contact the investigator, Katie Dick at 606-425-1576 or Dr. Jennifer Grisham-Brown at 859-257-8943 or email at Jennifer.grisham-brown@uky.edu. If you have any questions about your rights as a volunteer in this research, contact the staff in the Office of Research Integrity at the University of Kentucky between the business hours of 8am and 5pm EST, Mon-Fri. at 859-257-9428 or toll free at 1-866-400-9428. We will give you a signed copy of this consent form to take with you.

Signature of person agreeing to take part in the study

Date

Printed name of person agreeing to take part in the study

Name of (authorized) person obtaining informed consent

Date

APPENDIX C

Mirroring and Mapping Treatment Fidelity

Observer: _____ Participant: _____ Date: _____

Time Start: _____ Time Stop: _____ Setting: _____

Steps	Conducted Correctly (indicate with a check mark)					
	Trials					
	1	2	3	4	5	6
Participant notices the child is engaging in an activity						
Participant imitates the child’s nonverbal behaviors with the same or similar materials						
Participant models language at the target language level (i.e., nouns, protoverbs, requesting words)						
Complete Meaningful Teaching Episode (all steps completed)						
	Frequency of Child Vocalizations Within Trials					
	1	2	3	4	5	6
Vocalization						
Total Vocalizations						

Total number of meaningful teaching episodes: _____

APPENDIX D

Mand Model Treatment Fidelity

Observer: _____ Participant: _____ Date: _____

Time Start: _____ Time Stop: _____ Setting: _____

Steps	Conducted Correctly (indicate with a check mark)					
	Trials					
	1	2	3	4	5	6
Participant notices the child engaging in an activity						
Participant approaches student						
Participant interrupts the student’s activity and delivers a mand (i.e., a non-yes/no question) related to the activity						
Participant allows the student time to respond (3 seconds)						
If student makes a correct response(i.e., responds w/ appropriate response to the stimuli with a vocalization or verbalization), participant praises the student to continue w/ activity						
If the student makes no response or an incorrect response(i.e., responds with vocalization or verbalization obviously unrelated to stimuli), participant will model correct language						
Complete Meaningful Teaching Episode (all steps completed)						
	Frequency of Child Vocalizations Within Trials					
	1	2	3	4	5	6
Vocalization						
Total Vocalizations						

Total number of meaningful teaching episodes: _____

APPENDIX E

Naturalistic Time Delay Treatment Fidelity

Observer: _____ Participant: _____ Date: _____

Time Start: _____ Time Stop: _____ Setting: _____

Steps	Conducted Correctly (indicate with a check mark)					
	Trials					
	1	2	3	4	5	6
During a familiar routine or activity the teacher stops and looks at the student expectantly						
Participant pauses for 4 seconds						
Participant allows child to respond						
Depending on child’s response, participant responds with praise and gives child what they want or Uses an appropriate prompt to provoke the correct response						
If the child elicits a correct response, the teacher will praise the student and give them the desired materials or assistance.						
If the child does not respond or uses an incorrect response, the teacher will model the correct language.						
Complete Meaningful Teaching Episode (all steps completed)						
	Frequency of Child Vocalizations Within Trials					
	1	2	3	4	5	6
Child 1						
Total Vocalizations						

Total number of meaningful teaching episodes: _____

Student behaviors

Correct response: verbalization or vocalization to obtain wants or needs

Incorrect response: unrelated verbalization or vocalization

No response.

APPENDIX F

Fidelity of Treatment Package

Training Session Checklist

Observer: _____ Participant: _____ Date: _____

Time Start: _____ Time Stop: _____ Setting: _____

Steps	Task Completion (indicate with a checkmark)	
	Completed	Did Not Complete
Researcher begins by greeting the participant.		
Researcher provides purpose of study.		
Researcher goes over outline of the naturalistic strategies		
Researcher presents video model to participants.		
Researcher goes over examples and non-examples of naturalistic strategies.		
Researcher asks participants if they have any questions.		

APPENDIX G
Teacher Perception Survey

Please rate each statement using the rating scale below. Indicate selected answer using a checkmark.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The strategies I was trained on positively impact children in the classroom					
The strategies are applicable and easy to implement					
The video models helped me learn how to implement the strategies					
The verbal feedback before and after sessions helped me to implement the strategies					
I will continue to use these strategies in the classroom					
The training I received was helpful					
This study has impacted my instructional strategies in					

a positive way					
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Vita

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