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Evaluating a Rapid Coaching Intervention Delivered Remotely: Teaching Naturalistic Language Strategies to a Parent of Child with Down Syndrome

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EVALUATING A RAPID COACHING INTERVENTION DELIVERED REMOTELY: TEACHING NATURALISTIC LANGUAGE STRATEGIES TO A PARENT OF CHILD WITH DOWN SYNDROME

THESIS

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in the
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By

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ABSTRACT OF THESIS

EVALUATING A RAPID COACHING INTERVENTION DELIVERED REMOTELY: TEACHING NATURALISTIC LANGUAGE STRATEGIES TO PARENT OF CHILD WITH DOWN SYNDROME

Parents of young children play a significant role in their child's communication development during early childhood. Many parents of children with or at risk for disabilities could benefit from learning ways to promote their child's communication. This study implemented a rapid coaching intervention to teach a parent of a child with Down syndrome how to implement naturalistic language strategies such as expanding on their child's play, providing linguistic input during play, and arranging the environment to create an opportunity for their child to communicate.

KEYWORDS: Naturalistic Language Intervention, Down Syndrome, Linguistic Input, Environmental Arrangement

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(Name of Student)

4/22/2024
Date

DEDICATION

To my Grandfather who passed away during my time in Graduate School. Your constant support, love, and belief in me provided me with the determination that I needed during my time in this program. You taught me many things, but you especially taught me that hard work and determination will help me to reach my goals and dreams in life. I love you and am so thankful for all our wonderful times together.

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Introduction

Parents of young children play a significant role in their child's communication development during early childhood and often serve as a child's earliest teacher. Communication involves exchanging information with another person, which can be further divided into understanding (or competence) and expression (American Speech Hearing and Language Association, n/d). Expressive communication includes verbal and non-verbal behaviors to effectively share one's wants, needs, and feelings with another person. Children learn language during interactions, meaning they learn the rules for communicating and are often encouraged to use speech during these exchanges (Owens, 2019).

Parent and child interactions can provide multiple naturally occurring opportunities for learning (Hemmeter & Kaiser, 1994). For example, adults provide examples of how to communicate during early exchanges with their infant (e.g., using speech to name a toy). Encouraging early language development is often part of early childhood, especially for young children with disabilities who may not reliably learn language during early interactions. Children with language delays may exhibit challenging behavior (e.g., tantrums, aggression) if they do not have a reliable way to communicate (Chow & Wehby, 2016). A long-term benefit of increasing communication among young children with or at risk for disabilities is increased independence and aid in

academic success (Fuller & Kaiser, 2020). Because of this, many parents would benefit from receiving tools and training on promoting expression in their children.

There are various methods of encouraging early communication in young children with or at risk for disabilities, and one of those methods is to provide coaching to the child's parent. The coaching process consists of "direct teaching, guided practice with feedback, caregiver practice and reflection with feedback, and the interventionist backing out to increase caregiver independence" (Lane & Brown, 2016, p. 21). Most research studies that have implemented coaching with parents included many hours of coaching for families, with an average of more than 27 hours (Artman-Meeker et al., 2015). There is limited research on using relatively quick coaching methods to train parents (e.g., Lane et al., 2016; Hatcher & Grisham-Brown, 2018).

Rapid coaching consists of quick cycles of providing rationales, modeling, coaching, and feedback to train parents to use strategies to promote their child's expressive communication (Lane et al., 2016). Rapid coaching may be feasible for practitioners who have limited time with families. In Lane et al. (2016), the intervention consisted of providing rationales for each naturalistic strategy, modeling of the implementation of the strategy, coaching during parent-child play interactions, and providing performance-based feedback on the implementation of the strategies. This study also found that the children's initiations and vocal communicative responses increased during the coaching sessions. Rapid coaching was evaluated in clinics (Campbell, 2022; Reiss, 2023) and homes (Zhu et al., 2022), and via distance technologies (Lane 2023a; Mcduffie et al., 2013). Providing coaching to parents via distance technologies can be more feasible for families who may live in geographically

isolated areas, have health concerns, or cannot travel for various reasons (Lane 2023a). In the current study, a rapid-coaching intervention will be used via distance technologies due to how feasible it is for families for the reasons previously provided.

An interdisciplinary approach to increasing expressive communication in young children is highly important. Both Board Certified Behavior Analysts (BCBAs) and Speech-Language Pathologists (SLPs) use naturalistic language interventions and have very similar goals when it comes to working with young children (Lane & Brown, 2023). "The term naturalistic language intervention is an umbrella term used to represent communication-focused instruction that occurs during typical activities and includes age-appropriate materials and corresponding communication targets" (Lane et al., 2022, p. 320). SLPs and BCBAs both follow a code of ethics, are required to use evidence-based practices (EBP) when working with the client and their family. They also both share a common goal of working to provide high-quality care to the client and their family. Because of the differing backgrounds and education of SLPs and BCBAs, there is a lack of collaboration between these two types of practitioners (Lane & Brown, 2023). A few recent studies have included SLP feedback during intervention development (Campbell 2022; Reiss 2023). Because of the importance of increasing the collaboration between the two, a behavior interventionist collaborated with an SLP to develop a naturalistic intervention plan in the current study.

Much of the previous research on naturalistic language interventions occurred with children with or at risk for autism spectrum disorder (e.g., Lane et al., 2016; Lane et al., 2020; McDuffie et al., 2013; Pak et al., 2023), but children without autism also benefit. Similar naturalistic language interventions have applicability for all children,

including children with Down syndrome (Kaiser & Roberts, 2013). Children with Down syndrome experience delays in the acquisition of first words and the development of expressive vocabulary (Paul & Norbury, 2012). “The most consistently reported language profile in DS is one in which expressive language is more severely impaired than receptive language abilities (Laws & Bishop, 2003)” (As cited in Paul & Norbury, 2012, p. 104). Children with Down syndrome often have delayed acquisition of first words and the rate at which their expressive vocabulary grows is slower than expected (Berglund et al., 2001). When working with children with Down syndrome, it is important to focus on teaching early communication. One way is to teach families to aid in the development of early vocalizations, gesture and eye gaze to initiate and respond during conversational exchanges with others (Martin et al., 2009). Parents of children with Down Syndrome experience higher levels of stress than parents of typically developing children (Dabrowska & Pisula, 2010). Since many children with Down syndrome have language delays, giving parents of these children resources and training on how to increase their child’s communication can benefit these families.

Purpose

A common struggle for families, including families with children with Down syndrome, is supporting their child’s expressive communication development. Children without autism are underrepresented in previous studies, especially in the literature related to naturalistic language interventions. The purpose of this study was to replicate and extend work on the rapid coaching intervention based on previous studies conducted by Campbell (2022) (in a clinic, with SLP support), Lane (2023a) (all sessions conducted remotely), and Reiss (2023) (replication of Campbell, 2022). A rapid coaching

intervention was implemented to teach parents of children with Downs Syndrome naturalistic language interventions. All children with Down syndrome are at risk for communication deficits, so this study can apply to many families that have children with Down syndrome.

Research Questions

1. When a rapid coaching intervention is implemented remotely during parent-child play sessions, will the parent implement the naturalistic strategies with fidelity while engaging in play with their child with Down syndrome?
2. After the intervention, will the child display an increase in expressive communication (number of words, number of different words, and mean length of utterance in morphemes [MLU])? Due to the limited amount of child data, this question was expanded after the study ended with the parent and child dyad to include vocal responses and initiations to the parent during baseline and at the end of the study.
3. Will the parent who is not coached on naturalistic strategies have an increase in the use of the strategies solely based on observing the coached parent?
4. After the study is completed, what is the parent's perception of the intervention?

Method

The methods of this study were based on rapid coaching guidelines provided by Lane (2023b), as well as a combination of procedures from previous studies conducted by Campbell (2022) (in a clinic, with SLP support), Lane (2023a) (all sessions conducted remotely), and Reiss (2023) (replication of Campbell, 2022).

Participants

The inclusion criteria for the study were that the parent (a) was at least 18 years old, (b) the primary caregiver of a young child who was between 1 and 4 years old, diagnosed with Down syndrome, and displayed delays in expressive language, (c) fluent in spoken and written English, and (e) could access the internet (e.g., smartphone, tablet) to attend virtual sessions. Delays in expressive language included a score below the 10th percentile on the MacArthur Bates Communicative Development Inventory [MCDI] and/or the child uses 20 or fewer spontaneous words during a language sample. A parent would have been excluded if they had previous experience with naturalistic language interventions.

One parent-child dyad was recruited for this study. The parent, Carly, was a 41-year-old White and non-Hispanic female with no previous experience with naturalistic language interventions. The mother was a school counselor, with one other child who was 11 years old and typically developing. The child was Ellie, Carly's biological daughter. At the time of the study, Ellie was 21 months old. Ellie was diagnosed with Down syndrome/Trisomy 21. Ellie received occupational therapy, speech therapy every 2 weeks, and physical therapy weekly. During pre-intervention observations, it was noted that Ellie typically communicated through 1-word approximations, canonical babbling,

sign language, eye gaze, and gestures. Generally, Ellie was socially motivated by adult attention, and often shifted her gaze to ensure that others are looking at her. Ellie's father, Jason, was also recruited for the study as the non-target parent. Jason presented as a white male in similar age to Carly. No further information was gathered for Jason.

The researcher was a 23-year-old White, non-Hispanic female with a bachelor's degree in kinesiology and psychology. The researcher was enrolled in the University of Kentucky's applied behavior analysis master's program. Previously, she worked as a registered behavior technician for two years and is currently a student therapist at a university-based clinic for behavioral support. The researcher served as the primary data collector. The secondary data collectors were also in the University of Kentucky's applied behavior analysis master's program. The first secondary data collector was White, non-Hispanic, and a 25-year-old female. The second secondary data collector was White, non-Hispanic, and a 23-year-old female.

Setting, Format of Sessions, and Materials

Sessions were conducted via Zoom (baseline, intervention, and follow-up conditions), except for one home visit at the beginning of the study. A second home visit was scheduled, but the parent withdrew from the study, and, as such, this did not occur. Before the initial home visit, the parent completed a Demographic form (see Appendix A). During the home visit, the researcher conducted a brief interview (see Appendix B). In addition, the target parent (caregiver who self-nominated to receive training and coaching) played with her child, and later, a research team member conducted a language sample; both interactions were recorded using a handheld digital camera. See Appendix D for the directions used for the Language Sample. The research team used toys like the

Melissa and Doug wooden birthday cake set and animal veterinarian toy set during the language sample. The target parent also filled out the MCDI: Words and Sentences form during this visit.

Online coaching sessions were conducted with the research team, target parent, and child. All sessions were recorded using Zoom technology, with videos saved to a secure cloud-based server. The average duration of coaching sessions was 29.4 minutes, and the visits ranged from 7 min-50 min depending on the number of sessions conducted in the visit. There was a total of 8 visits conducted. The sessions took place during play in the family's home, with toys and activities that the child preferred and selected. Before receiving coaching on a target behavior, the parent completed an asynchronous module, which served as the training. The parent was provided access to asynchronous training modules during the training sessions, which they watched on their personal devices. The training videos ranged from 6-9 min and contained a combination of narrated PowerPoint slides and video models (see Appendix J). During online coaching sessions, the parent used their own personal device (i.e., computer or iPhone) to join the Zoom meeting and materials in their home (e.g., Play-Doh, dolls, cars, etc.). Throughout the coaching sessions, a bank of non-training video models of the procedures were used as needed. There were three team members (i.e., primary researcher and 2 secondary researchers) present during meetings, with their cameras on for the duration of each visit.

Measurement System and Dependent Variables

The primary dependent variable was the parent's fidelity of implementing naturalistic strategies and procedures. Event recording with time stamps was used to capture the parent's behaviors. Time stamps provide increased precision compared to

event recording alone because timestamps allow the researcher to evaluate how often the parent engages in the target behavior and what time they engage in that behavior (Ledford et al., 2018). With the addition of timestamps, "more precise agreement calculations are possible (Yoder & Symons, 2010)" (As cited in Ledford & Gast, 2018, p. 103). Multiple parent behaviors were screened, including (a) imitation and expansion, (b) noticing and responding, (c) providing linguistic input, (d) environmental arrangement, and (e) environmental arrangement + prompting/modeling, (f) open-ended questions + prompting, or (g) environmental arrangement + time delay with prompting. See Appendix C for the definitions of parent behaviors. See Appendix E for the data sheet used to collect data on parent behaviors.

A secondary dependent variable was added to gain insight on the child's levels of communication from baseline to intervention. The secondary dependent variable was the child's expressive communication. Expressive communication included the child's use of vocal responses and initiations to the parent. The measurement system used to assess these behaviors was frequency using time stamps. See Appendix I for the definitions of child expressive communication.

Screening

Parent Behaviors

Parent behaviors were screened via a video recording. A 12-min video was recorded of the parent engaging in play with their child as they normally would. The video was then split into three 4 min videos. If the parent displayed the behavior more than once during each 4 min video, the behavior was not considered a target behavior in the study. If the parent displayed the behavior 1 time or less during each 4 min video, the

behavior was considered a target behavior in the study. Based on the data from screening, the parent behaviors that were selected for Carly were (a) expansion, (b) providing linguistic input, (c) environmental arrangement, and (d) environmental arrangement + prompting.

Child Behaviors

Child behaviors were assessed using the MCDI (Marchman et al., 2023) and the results of a language sample. From the transcription, the following were calculated: total number of words, number of different words, and MLU. The MCDI and language sample were shared with a Speech Language Pathologist for further interpretation and feedback. The behavior interventionist met with the SLP via zoom to discuss the findings from the assessments and develop a plan for the naturalistic language intervention.

Experimental Design

A multiple baseline across behaviors design was used to evaluate the intervention. An A-B comparison is conducted and replicated across multiple behaviors in a multiple baseline across behaviors design. The parent behaviors in this study were potentially non-reversible behaviors, meaning that once the parent acquired the behaviors, the parent would likely maintain the behaviors over time and not return to baseline levels when the intervention was withdrawn (Ledford & Gast, 2018). In this design, the intervention was introduced at different points in time, specifically when the parent met the criterion of displaying a target behavior at least four times per session across three consecutive 4 min sessions. The expectation was that improvements in the parent's behavior would only occur when the intervention was introduced for that behavior. Data were collected concurrently and continuously across all tiers (i.e., parent behaviors).

A multiple baseline design was selected instead of a withdrawal design because a withdrawal design consists of removing and reintroducing an intervention with the expectation that responding will change based on the change in condition. In withdrawal designs, it is anticipated that the behavior measured in the study will be reversible. The behaviors in this study were potentially non-reversible, so a withdrawal design would not align with this. Additionally, removing the intervention could be considered unethical because the intervention aimed to promote communication in young children. A multiple baseline design was selected instead of a multiple probe design because frequent, continuous measurement of the dependent variables (i.e., parent behaviors) during pre-intervention can help detect covariation, which can potentially occur when separately intervening on related behaviors within the context of the design.

Threats to internal validity were controlled for in this study. Since the sessions were conducted one-to-one, the threat of observational learning was eliminated. Adaptation effects were controlled for since the sessions were conducted in-home and via Zoom instead of a novel setting (i.e., a clinic). The threats of maturation and testing were controlled for by conducting a relatively brief study. Coaching studies that have been conducted in the past typically lasted 4-6 weeks. To control for the threat of attrition, I planned to have at least 2 participants in the study. In case a participant was to drop out from the study, there would have still been an additional participant to continue with the study. Unfortunately, only one participant was recruited for this study. The threat of procedural infidelity was controlled by training secondary data collectors to collect procedural fidelity for 20% of sessions throughout the study (Ledford & Gast, 2018). The secondary data collectors were also trained to collect interobserver agreement (IOA) and

collected IOA for at least 20% of sessions in each condition, which detected any observer drift.

The researcher planned to assess changes in child expressive communication in the form of speech using a pre- and post-test language sample. Because the participant withdrew from the study, a post-test language sample was not collected. Since a post-test language sample could not be conducted, the child's behavior was assessed by collecting data on the frequency with timestamps of communicative initiations and responses that the child engaged in during play sessions. Any pre- and post-test results are considered correlational at best because contributing factors outside of the study (e.g., learning from school, therapies, etc.) could have influenced the child's response.

Procedures

Prior to beginning baseline sessions, a behavior interventionist met with an SLP to review data from screening and collaborated to develop a naturalistic language intervention plan. Based on the findings, the SLP and behavior interventionist collaborated to decide on an instructional target. It was decided that during child-parent play sessions, the parent should focus on promoting 1-word statements, with a focus on nouns and verbs.

Baseline

Baseline sessions were conducted via Zoom. The parent placed the child's preferred toys in the family's living room, in which the child and parent typically play together in. The parent was instructed to play with their child (i.e., the researcher said "play with your child as you normally would") with no additional support or information provided by the researcher. Before baseline sessions, parents knew the purpose of the

study (i.e., to teach the parent strategies to promote verbal communication in their child) but not the specific behaviors that were intervened on later. The researcher set a timer for 4 min and allowed the child and adult to play. Baseline sessions continued for at least three sessions or until the data were stable across tiers.

Additionally, one baseline session was conducted via zoom with the non-target parent. The parent was instructed to play with their child with no additional support or information provided by the researcher. The researcher set a timer for 4 min and allowed the child and non-target parent to play.

Intervention

Intervention sessions were conducted on Zoom and scheduled for 1 hr per week. The independent variable was the rapid coaching intervention, which consisted of parent training, parent coaching sessions, and post-session feedback.

1. Asynchronous parent training: The researcher gave the parent access to an asynchronous module for the training using a link to a personalized OneDrive folder hosted by the research team. The folder included subfolders for each target behavior, with the first folder released before introducing coaching for the first target behavior and each additional folder released for each subsequent behavior once the parent met the learning criterion in a previous tier. Each subfolder included a handout that summarized key information from the training video. For each naturalistic language strategy, one parent training was conducted. See Appendix J for screenshots of content from the training folder.
2. Live review of behaviors and coaching sessions: After the adult completed the asynchronous module, coaching for that behavior was conducted virtually. A

review of the training was provided for the first coaching meeting for each behavior. When teaching target behaviors 2-4, the researcher reminded the parent to combine what they have learned in previous sessions with what they are currently learning. The researcher asked if the parent had any questions. The researcher set a timer for 4 min and asked the parent to practice the naturalistic language strategy (including the name of the strategy) with their child. The 4-min session was screen-recorded on Zoom. If the parent engaged in the target behavior, the researcher provided immediate behavior-specific praise (e.g., "I love how you used a silly situation!"). Verbal prompts were provided if the parent did not engage in the target behavior after the first 2 min of a session. A verbal prompt consisted of telling the parent of a moment when they could engage in the target behavior.

3. Post-session Feedback: Immediately after the coaching session on the target behavior, the researcher gave the parent feedback on how the session went. Then, the researcher showed the parent the screen recording (using the built-in screen-recording option on a Mac-Book) that was taken during the coaching session. While watching the video, the researcher provided 1-2 examples of when the parent incorporated the target behavior accurately, and/or provided examples of when the parent could have incorporated the target behavior if needed. The researcher then asked if the parent would like to see a video model (i.e., a novel video model from a bank of video models not included in the training), and if they had any questions. The researcher answered any questions, and then instructed the parent to practice again.

Changes to Method

Due to delayed improvements in the prompting condition, the primary and secondary researchers conducted a live Zoom meeting with the parent to discuss procedures. This meeting occurred a few days after EA + Prompt Session 9, which was the last session conducted with this participant. During this meeting, the researcher provided a brief overview of Tier 3 (Environmental Arrangement) and Tier 4 (Environmental Arrangement + Prompting), discussed the differences between the two procedures, and modeled the procedures for the parent. A visual aid that described the steps for both EA and EA + Prompt procedures was provided and explained to the parent (see Appendix K). This visual aid was intended for the parent to use as a guide in future sessions. Tier 1 (Expansion) and Tier 2 (Providing Linguistic Input) were also reviewed by giving a brief overview and providing examples of how they could be incorporated. A visual aid reviewing Tier 1 (expansion) and Tier 2 (providing linguistic input) was also provided and explained to the parent to use as a guide in future sessions (see Appendix L). The parent was reminded to incorporate all learned behaviors into the play sessions. At the end of the meeting, the researcher asked if the parent had any questions pertaining to the procedures.

Coordination and Maintenance Conditions

Short-term maintenance data were collected on previously learned parent behaviors during sessions 12-29. If previously targeted behaviors were below the criterion during the final intervention session, a booster session would have been conducted where the parent received coaching on coordinating all behaviors in a single session. The coach would have provided praise throughout and feedback at the end

(identical to the earlier intervention condition). If this occurred, a long-term maintenance session would have been scheduled for one week later. In contrast, if behaviors were at the criterion, long-term maintenance sessions would have been conducted one week after the parent met the criteria for all target behaviors. Procedurally, long-term maintenance sessions would have been identical to baseline sessions. Except for monitoring short-term maintenance in previously targeted tiers, no other maintenance data were collected.

Social Validity

At the conclusion of the study, it was planned that a designated person (other than the researcher) would gather parent feedback by conducting a short interview with the parent. This did not occur due to the participant withdrawing from the study. The researcher would have asked the following questions, and would have recorded the parent's answers on a digital form by using their computer:

A. Tell me about your experience in this study.
B. What recommendations do you have for the researcher when conducting this training in the future with other parents?
C. How would you describe your child’s experience during this study?
D. Can you think of times when you have used the skills taught outside of the sessions?
E. What skill that was taught do you believe will be most helpful when playing with your child in the future? Why?

Interobserver Agreement

Two secondary data collectors were selected and trained to collect IOA data. The primary data collector trained the secondary data collectors on collecting the data by

reviewing the definitions of the behaviors, providing examples in person or via video, and conducting a practice session with a sample 4-min video of a child and parent playing until agreement was above 90%. During the study, all sessions were recorded, and the secondary data collector reviewed the videos to collect data on the frequency of the behaviors. IOA was assessed by using the point-by-point method with timestamps. An occurrence counted as an agreement if the time stamps of the primary and secondary data collectors were within 3 s of one another. Throughout the study, IOA had to be at 80% agreement or higher. If IOA fell below 80% agreement for any session, the researcher planned to conduct a re-training with the secondary data collector(s). During the retraining, the researcher would have reviewed the definitions of target behaviors, provided additional examples, and reviewed any questions or concerns the secondary data collector(s) had. IOA data for all behaviors was collected for 20% of the sessions in each study condition. The formula for IOA was as follows: number of agreements (within the 3 s time window) divided by the number of agreements plus disagreements, then multiplied by 100 (Ledford et al., 2018).

IOA data were collected for 33.3% of baseline and 23% of intervention sessions, with 100% agreement. For the baseline condition of the data collected on the non-target parent's behaviors, IOA was 100%. For child behaviors, IOA was collected for 33.3% of sessions in baseline and intervention, 87% agreement in baseline, and 88% agreement in the intervention condition. IOA was collected for the pre-test language sample and there was 100% agreement.

Procedural Fidelity

Secondary data collectors were selected to take procedural fidelity data. The researcher reviewed the procedural fidelity data sheet with the secondary data collector before data collection, and the secondary data collectors practiced collecting procedural fidelity during a practice session. Procedural fidelity data was collected by recording occurrences and non-occurrences of the researcher's behavior, such as providing the parent with the video model and rationale for the target behavior, giving immediate behavior-specific praise during coaching sessions, and providing feedback. Procedural fidelity was collected for at least 20% of the sessions in each condition. To calculate procedural fidelity, the number of observed behaviors were divided by the total number of planned behaviors and multiplied by 100. PF data were collected for 33.3% of baseline and 23% of intervention sessions, with 100% fidelity recorded. See appendix F, G, and H for the data sheets used to collect procedural fidelity on the primary researcher's behaviors.

Results

The first three adult behaviors were taught to criterion. The participant withdrew during Tier 4, so this behavior was not taught to criterion. The graphed results of the parents' behavior are presented in Figure 1. Data were visually analyzed by considering the level, trend, stability/variability, overlap, and immediacy of effect (Ledford & Gast, 2018). The data were analyzed between conditions and across conditions. After evaluating the results, a functional relation was identified as present in the data because there were three basic demonstrations of effect at three different points in time, with one non-effect in the prompting condition (Barton et al., 2018).

Coached Parent Behaviors

Before introducing the intervention, baseline data were collected for three consecutive sessions to ensure there was stability in the data before intervening. The target behavior in Tier 1 was expansion. During the baseline condition, expansion was displayed at a low level with zero instances of the behavior observed. There was no variability and a zero-celerating trend in the data path. Data paths for all remaining baseline conditions were stable, with a low level, zero-celerating trend, and no variability in the data, except Tier 2 (linguistic input). The parent displayed one instance of the behavior when play expansion was introduced, but subsequent sessions remained at zero for the remainder of the condition. Due to the stability of the baseline data across tiers, the intervention was introduced in Tier 1. Between baseline and intervention conditions in Tier 1, there was 100% non-overlap and 0% overlap in the data. The intervention data for Tier 1 were variable along the ordinate, with the data ranging from 1-6 occurrences. The data ranged from a low to medium level. There was an accelerating trend in the

therapeutic direction observed during sessions 4-5 of the intervention condition, with a decelerating trend in the contra-therapeutic direction across sessions 5-7. An accelerating trend was observed and continued from sessions 7-11. A basic demonstration of effect was observed with the first target behavior (expansion).

Short-term maintenance data for Tier 1indicated variable levels of responding, with the data ranging from 0-8 occurrences. The data ranged from a low to high level. There was an accelerating trend in the therapeutic direction from sessions 12-13, and then a decelerating trend in the contra-therapeutic direction from sessions 13-14. There was an accelerating trend in the therapeutic direction from sessions 14-15, and then a decelerating trend in the contra-therapeutic direction from sessions 15-18. There was an accelerating trend in the therapeutic direction from sessions 18-20, and a decelerating trend in the contra-therapeutic direction from sessions 20-21. There was a zero-celerating trend from sessions 21-23, and a decelerating trend in the contra-therapeutic direction from sessions 24-24. From sessions 24-29, there is a zero-celerating trend, and there were zero occurrences of the Tier 1 (i.e., expansion) behavior.

Due to stability across tiers and the parent meeting mastery criterion for Tier 1, the intervention was introduced in Tier 2 (linguistic input). When the intervention was introduced, there was an abrupt and immediate change in level for linguistic input. However, there was an overlap in intervention (session 13) with baseline. The data for intervention in Tier 2 were variable. There was a decelerating trend in the contra-therapeutic direction from sessions 12-13. There was an increasing trend in the therapeutic direction from sessions 13-15. There was a decreasing trend in the contra-therapeutic direction from sessions 15-16. The data ranges from a low to high level- with

the data ranging from 0-10 occurrences. Session 13 may represent a temporary covariation in a single session that did not sustain. A basic demonstration of effect was observed for linguistic input. Short-term maintenance data indicated variable levels of responding, with the data ranging from 0-4 occurrences. The short-term maintenance data for Tier 2 was at a low level and started with an accelerating trend in the therapeutic direction, from sessions 17-19. There was a decreasing trend in the contra-therapeutic direction from sessions 19-21. There was an increasing trend in the therapeutic direction from sessions 22-24, and a decreasing trend in the contra-therapeutic direction from sessions 24-26. From sessions 24-26, there is a zero-celerating trend in the contra-therapeutic direction. From sessions 26-29, there is a zero-celerating trend, and there were zero occurrences of the Tier 2 (i.e., linguistic input) behavior.

Due to the parent reaching mastery criteria for Tier 2, the intervention was introduced to Tier 3 (environmental arrangement). Abrupt and immediate improvements in environmental arrangement were observed when the intervention was introduced. There was 100% non-overlap and 0% overlap between baseline to intervention condition. Data were relatively variable along the ordinate, with the data ranging from 4-7 occurrences. The data ranged from a medium to high level. There was a decreasing trend in the contra-therapeutic direction from sessions 17-18, and an increasing trend in the therapeutic direction from sessions 18-19. A basic demonstration of effect was observed for environmental arrangement. Short term maintenance data indicated variable responding, with an accelerating trend in the therapeutic direction from sessions 20-21 and a decelerating trend in the contra-therapeutic direction from sessions 21 to 23. There was an accelerating trend in the therapeutic direction from sessions 23 to 24, and the data

were stable from sessions 24 to 25. There was a decelerating trend in the contra-therapeutic direction from sessions 25 to 26, and the data were stable from sessions 26 to 27. There was an accelerating trend in the therapeutic direction from sessions 27 to 28, and then a decelerating trend in the contra-therapeutic direction from sessions 28 to 29. Throughout short term maintenance the data remained at a low-medium level, with the data ranging from 0 to 3 occurrences.

Once the parent met mastery criterion for Tier 3 behavior of Environmental Arrangement, intervention was introduced to Tier 4: EA + Prompting. For the parent to meet criterion in this tier, they had to display 4 total occurrences of EA, with at least half of those occurrences including prompting (i.e., 2 or more instances of EA Alone and 2 or more instances of EA + Prompting). The data collected on Tier 4 are variable with no trend. The data is at a low level, with the data ranging from 0-3 occurrences. There is some overlap between baseline and intervention in Tier 4. The participant withdrew from the study at session 29, so data collection was ended. Due to not meeting the criterion and withdrawing from the study, a basic demonstration of effect was not observed for this behavior. See Figure 1 for a visual representation of the data.

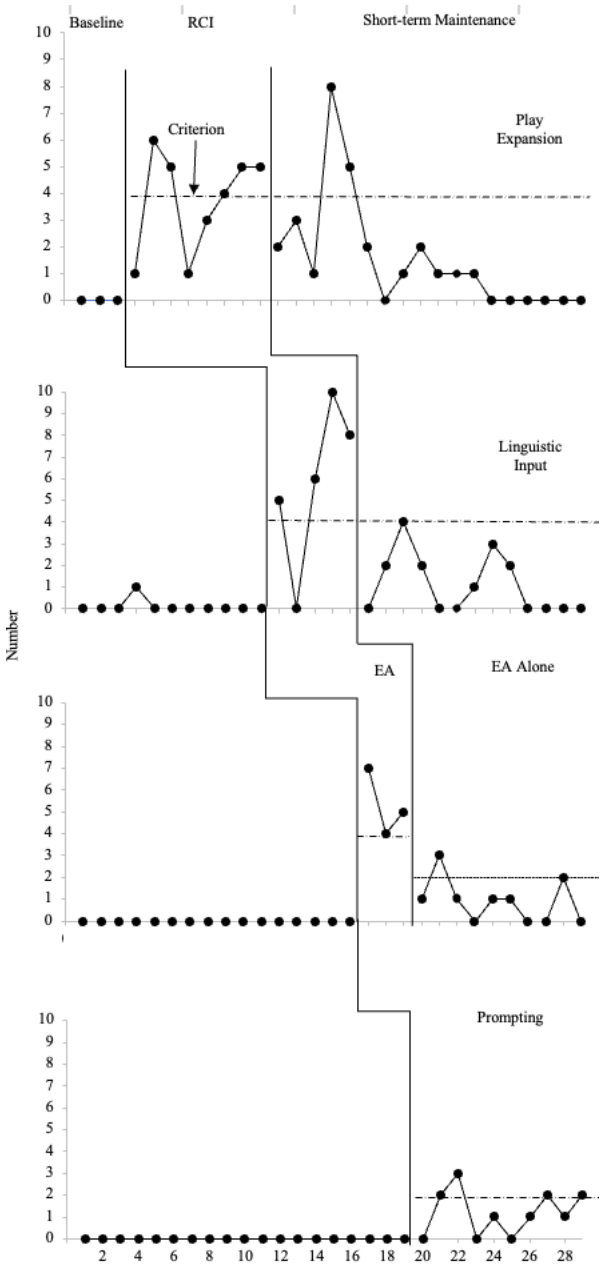


Figure 1 *The Parent's Fidelity of Implementation of Naturalistic Language Strategies*

Note. RCI= rapid coaching intervention, EA alone= environmental arrangement sequence alone, EA + Prompting = environmental arrangement sequence + prompting. The criterion for Tier 4 when prompting was introduced was 2 instances of each of the behaviors (i.e., EA alone and EA + Prompting).

Non-Target Parent Behaviors

During the Zoom meeting in which baseline sessions were conducted for the coached parent, Carly, a 4-min video of the non-target parent, Josh, was recorded. This video was then coded for the target parent behaviors. Josh displayed none of the behaviors, meaning he had 0 occurrences of expansion, 0 instances of linguistic input, 0 occurrences of environmental arrangement, and 0 occurrences of environmental arrangement + prompting at baseline. Since the participant withdrew from the study, we could not collect post-intervention data on the non-target parent.

Child Language Sample and MCDI

A language sample was conducted during the screening session to determine the total number of words, novel words, and MLU emitted throughout a 15-min session. During this pre-test, Ellie had 12 total words (all approximations) and 6 novel words (all approximations). The MLU of Ellie's words was 1. I planned to collect a language sample and evaluate it as a post-test after the completion of the intervention, but this did not occur due to the parent withdrawing from the study. After reviewing the MCDI-Words and Sentences form that the parent filled out, it was found that prior to the study, Ellie scored below the fifth percentile on this assessment.

Child Behavior Data

After the intervention was stopped due to the parent's withdrawal, data were collected on child behaviors (initiating and responding) that Ellie engaged in by watching the video recordings in the form of a pre- and post-test. The data was collected from sessions 1-3 of parent behavior sessions (pre-test) and sessions 27-29 of parent behavior sessions (post-test). The data are displayed in Figure 2. For child initiations, the pre-test data were relatively stable and at a low level. In post-test, there was an abrupt and

immediate change in the level of initiation. Data in the post-test condition were at a medium level, with slight variability. There was no trend and 0% overlap between baseline and intervention data. For child responses, the pre-test data are variable and at a low-medium level, with a decreasing trend in the contra-therapeutic direction. In post-test, there was an abrupt and immediate change in level. During post-test, responses occurred at a relatively high level, with slight variability. There was no clear trend in the data path, and there was 0% overlap between pre-test and post-test data. See Figure 2 for a visual representation of the data.

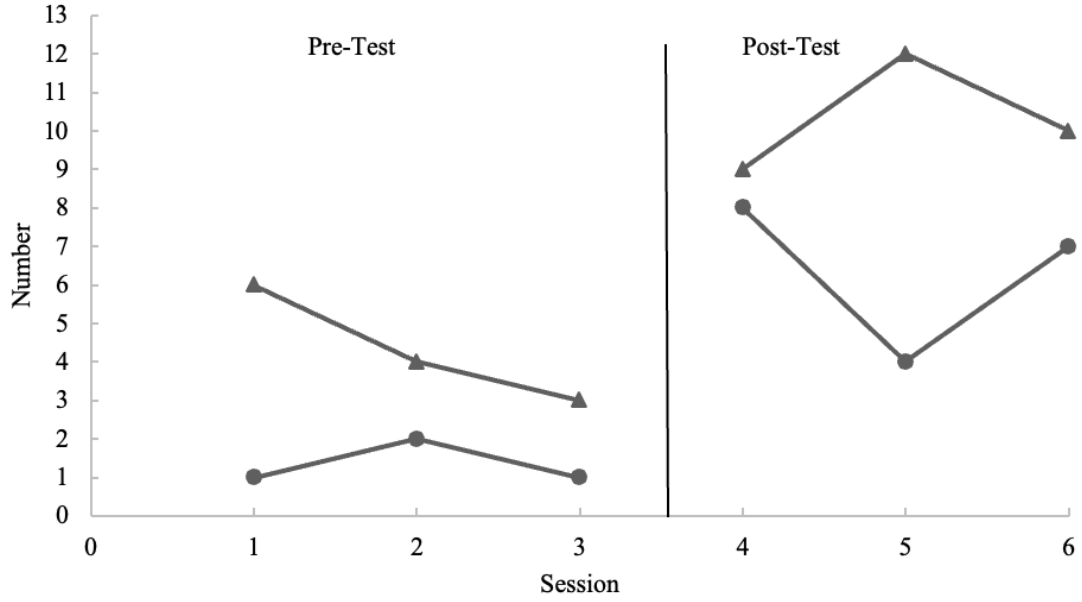


Figure 2 *Occurrences of Child Behavior*

Note. The circles represent initiations, and the triangles represent responses.

Discussion

The purpose of this research study was to extend the work on the rapid coaching intervention based on previous studies conducted by Campbell (2022), Lane (2023a), and Reiss (2023). The research questions were: (1) *When a rapid coaching intervention is implemented during parent-child play sessions, will the parent implement the naturalistic strategies with fidelity while engaging in play with their child with Down syndrome?* (2) *After the intervention, will the child display an increase in expressive communication (number of words, number of different words, and mean length of utterance in morphemes [MLU], as well as responses and initiations)?* (3) *Will the parent who is not coached on naturalistic strategies have an increase in the use of the strategies solely based on observing the coached parent?* (4) *After the study is completed, what is the parent's perception of the intervention?*

The study evaluated the implementation of a rapid coaching intervention to teach a parent of a child with Down syndrome to use naturalistic language strategies throughout parent-child play sessions. The behaviors that were taught to the parent were expanding on her child's play, providing linguistic input, arranging the environment (planning communication opportunities), and arranging the environment + prompting target language (involving contextually relevant nouns and verbs). There were therapeutic improvements in the first three behaviors, with no changes in untreated behaviors until the intervention was introduced. There were three demonstrations of effect at three different points in time, with one non-effect. Despite the parent withdrawing from the study before the fourth and final behavior was mastered, a functional relation was found between the intervention and the parent's implementation of the naturalistic language

strategies. Thus, this study supports previous findings of Campbell (2022), Lane (2023a), and Reiss (2023), except for sustained improvements in prompting. In previous studies, parents displayed relative improvements in prompting and maintained those behaviors once all behaviors were learned. The findings of this study provide insight into how to continue to promote parents' use of naturalistic language strategies, specifically responsive interactions, and environmental arrangement, but warrant additional consideration of teaching prompting.

Child behaviors in the form of vocal expressive communication were measured by evaluating the first three baseline sessions and the last three intervention sessions. The child displayed significant increases in responses and initiations from baseline to intervention. In baseline, the child's total number of initiations ranged from 1-2 occurrences. It significantly increased in intervention, ranging from 4-8 occurrences during intervention. In baseline, the child's total number of responses ranged from 4-6 occurrences and increased during the intervention condition, ranging from 9-12 occurrences along the ordinate. As mentioned before, it cannot be said that the intervention caused the change in the child's behavior. The relationship between the intervention and the child's behavior was correlational at best, but improvements in the child's expressive communication (initiations and responses) were observed in this study.

Additionally, it was planned to evaluate the non-target parent's implementation of the naturalistic language strategies before and after the intervention. This aimed to evaluate if the non-target parent learned any of the naturalistic language strategies through observing the coached parent during play. Unfortunately, only a pre-test was evaluated during this study due to the parent withdrawing from the study. During the pre-

test, the parent displayed none of the target behaviors (i.e., expansion, providing linguistic input, environmental arrangement, and environmental arrangement + prompting). If a post-test was conducted and the non-target parent displayed improvements in the targeted behaviors, the relationship between the coached parent's behaviors and the non-target parent's behaviors would be correlational at best.

Although not a specific focus of this study nor a research question, this study provides additional examples of pre-intervention behavior analysts learning how to work with an SLP to plan instruction, specifically child instructional targets and feedback on parent behaviors (Lane & Brown, 2023). During this collaboration, a behavior interventionist administered the assessments and shared them with the SLP through a secured system. Once the SLP reviewed the assessment data, the behavior interventionist met with the SLP via Zoom to discuss the findings. Future studies may wish to include the parent(s) in target selection with the SLP and behavior interventionist.

Limitations

There are several limitations that require attention in this study. Attrition occurred due to the parent withdrawing from the study during the final condition while learning prompting. The parent withdrew due to conflicting procedures that she was learning with other professionals. The plan was to recruit at least two child-parent dyads to prevent the risk of attrition. The researchers advertised the study in various ways to recruit additional participants. However, only one child-parent dyad was recruited for this study, and they withdrew during Tier 4 (i.e., the last tier of the intervention). Due to the parent withdrawal, the researchers were unable to (a) observe the full effects of the intervention, (b) gather information on the parent's perception of the study, (c) collect a post-test

language sample of the child, (d) evaluate the non-target parent's behaviors in post-intervention, and (e) collect long-term maintenance data. Another limitation of the study was the lack of inter-participant replication. If an additional child-parent dyad had been recruited, the researchers could better speak to the generality of the findings. There was also a limitation with short-term maintenance results, in which the parent displayed difficulty maintaining previously learned behaviors when learning a new behavior.

Implications for Future Research

The findings of this study have implications for practitioners and researchers. First, practitioners may need to take a different approach to teaching prompting to families who receive various services. The parent in this study shared that it was very difficult to accurately implement the environmental arrangement and environmental arrangement + prompting procedures due to the conflicting procedures she was taught when receiving speech services. Practitioners may need to give parents more time to acquire these skills and/or additional time to practice responsive interaction strategies (e.g., expansion, providing linguistic input) before implementing prompting procedures. Relatedly, prompting may not be a priority for some families or may be perceived as intrusive; this requires further consideration.

Second, practitioners may observe moderate improvements in the child's expressive communication (i.e., initiating/responding) from teaching parents how to implement naturalistic language interventions during play. From this study, we found that there was a correlation between the parent's implementation of naturalistic language strategies and children's expressive communication. Third, practitioners may need to tailor how they approach coaching during the intervention. The participant in this study

shared that they do not prefer feedback often. Relatedly, they did not ask many questions/share many thoughts during coaching sessions. For future research, a pre-intervention survey or interview could be conducted with the parents to determine how they prefer to receive feedback and other preferences regarding the intervention. This ensures that the parent receives services how they prefer, which may increase their motivation throughout the intervention.

Fourth, collecting data live using the Countee app with timestamps may be ideal for understanding how often the parent behaviors occur during sessions. In this study, the researcher did not get to make data-based decisions during the sessions, conducting sessions for the duration of the visit. Fifth, researchers could ask the parents to rotate throughout sessions if the family is a two-parent household. This could prevent the parent(s) from displaying behaviors reflective of "burnout" throughout the intervention. This would also allow both parents to learn the behaviors, which could increase the use of these procedures with their children in the future.

Conclusion

This study extended the findings of Campbell (2022), Lane (2023a), and Reiss (2023), specifically that parents can learn responsive interaction strategies and environmental arrangement. The intervention may be effective for teaching these behaviors to parents but potentially not prompting. Researchers are encouraged to continue evaluating the effects of rapid coaching and to continue to involve SLPs when selecting instructional targets. Researchers are also encouraged to continue to replicate the use of rapid coaching to teach parents of children with Down syndrome to use naturalistic language strategies during play since the research on these types of

interventions with children with Down syndrome is limited. Additional research is needed to learn more about the extent to which this intervention has utility across various contexts and populations.

Appendix A

Demographic Information Form

We ask that you complete the following form to help us learn more about you and your family.

- Your name:
- Your child's name:
- Relationship to the child:
- Anyone else who lives in the home:

- What is your age?
- What is your occupation:
- What is your race/ethnicity?

- What is your child's age (in months)?
- What is your child's race/ethnicity?
- Gender:
- Does your child have a diagnosis? Please describe.

- What services does your child currently receive? Past services?

- Anything else you would like us to know?

Appendix B

Interview Form

*Follow-up on *Demographic Information*, if needed*

1. What are some strengths of (child's name) that you want to share?
2. What about some areas that you feel need increased attention?
3. How does your child typically communicate?
4. *Based on the response, follow-up to learn more about different modes of communication, for what purpose(s) the child communicates, and how often.*
5. What are ways in which your child shares their wants, interests, and feelings with you?
6. What are some words that your child will say on their own?
7. Describe your experience learning about and supporting (child's name) communication.
8. What does your child like to do for fun?
9. What does your child dislike?
10. Anything else you would like us to know?

Appendix C

Imitation and Expansion	Play-focused imitation is when the parent immediately (within 1-3 s) copies their child's play behaviors, and expansion is when the parent copies what the child is doing and then introduces another toy or action (based on the current activity) to the child's play. • Examples of Imitation: The child is pretending to feed a baby doll, so the adult begins pretending to feed a baby doll. • Nonexamples of Imitation: The child engages in challenging behavior (e.g., aggression toward property or others, SIB, etc.) and the parent engages in the same behavior. • Examples of expansion: A child is pretending to feed a baby doll, and the parent pretends to feed the baby doll and then begins to brush the baby's hair. • Nonexamples of expansion: A child is pretending to feed a baby doll, and the parent begins to play with blocks.
Noticing and Responding to Communication	The parent notices and responds to the child's communication within 1-3 s by adding 1-2 meaningful words, recasting what the child said, or providing language for non-verbal communication • Examples: "the dog fell", "the doll is running", "it is a cat" • Nonexamples: "dog fell", "on table"
Providing Linguistic Input: Mapping Language During Play & Narrating During Play	Mapping language during play: The parent adds meaningful language to the child's play by modeling grammatically correct language that the child could potentially use during play or conversation and waits up to 5 s for the child to respond. • Examples: "The dog is jumping" (while the child is bouncing a dog toy), "The car is rolling" (while the child is rolling a car) • Nonexamples: "you are painting, and I am over here drawing!" Narrating own play: The parent uses a verbal model of a brief, grammatically correct sentence to describe their own play that is

	a part of the child's play routine and waits up to 5 s for the child to respond. • Examples: "The babies are sleeping" (while the parent and child are holding a babies), "the frogs are jumping" (while the parent and child are playing with frogs) • Nonexamples: "baby sleeping", "ball bounced"

The following table outlines the teaching procedures that will be selected from to include in the parent behaviors that will be taught. The teaching procedure that will be included during coaching will be based on the child's level and needs.

Environmental Arrangement	The parent arranges the environment (e.g., naturally maintaining access to materials while not taking materials from the child) and waits up to 5 s for the child to express interest and/or respond. The parent will then give the child access to the materials. If the child did not respond but is still interested in the item, the parent will give the child access to the item. • Examples: Parent provides the child with a play-dough container that they will need help opening and waits 5 s to see what the child does, parent places an item on a shelf out of reach and waits 5 s to see what the child does • Non-example: Parent takes an item from child and waits for them to ask for it
Environmental Arrangement + prompting/modeling:	The parent uses an environmental arrangement strategy and waits up to 5 s for the child to show interest. Once the child shows interest, the parent provides a verbal model of an example of what the child could say in that moment. The parent waits 5 s for the child to imitate the model. If the child repeats the model within 5 s, the parent will provide access to the item and expand on the child's language by adding 2-3 meaningful words. If the child did not provide the verbal model but is still interested, the parent will give the child the item and repeat the verbal model. If the child loses interest, the parent ends the trial.
Environmental Arrangement + Time Delay with Prompting:	The parent arranges the environment (e.g., naturally maintaining access to materials while not taking materials from the child) and waits up to 5 s for the child to initiate

	interest. The parent will then wait 5 s to see if the child will communicate in any way (e.g., reaches for the item, vocalization). If the child does not provide the intended verbal communication, the parent will then provide a model of what the child can say and wait 5 s to see if the child imitates the verbal model. Once the child provides the verbal model independently (i.e., before the prompt) or after the prompt, the parent will provide access to the item and expand on the child's language by adding 2-3 meaningful words. If the child did not provide the verbal model but is still interested, the parent will give the child the item and repeat the verbal model. If the child loses interest, the parent ends the trial. • Examples: Parent provides the child with a play-dough container that they will need help opening and within 5 s, the child reaches for the container. The parent says "open" and waits 5 for the child to respond. The child repeats the verbal model, so the parent opens the container and gives it to the child while saying "open the play dough" • Nonexamples: Parent takes a teddy bear away from the child. Within 5 s, the child whines and the parent provides a verbal model by saying "give". The parent waits 5 s for the child to respond, and the child repeats the model "give". The parent gives the child the teddy bear.
Asking Open-Ended Questions + Prompting:	The parent asks the child a question that they cannot respond "yes/no" to and then waits up to 5 s for the child to respond using verbal communication. If the child responds with verbal communication within those 5 s, the parent responds with an expansion on the child's language. Examples: • Parent asks child, "What should we play with next?". The child responds with "cars" within 5 s. The parent responds with "Let's play with cars". • Parent asks child, "What should we make?". The child responds with "cake" within 5 s. The parent responds with "Let's make vanilla cake."

	Nonexamples: • Parent asks child, “Do you want this?”, and the child responds with “no” within 5 s. • Parent asks child, “Do you like this game?”, and the child responds with “yes” within 5 s. The parent then replies with, “okay, let’s play!”

Appendix D

Language Sample Guidelines

Implementation

General: Conduct the language sample for 15 minutes. Record the language sample. The language sample should begin once the child is engaged and interested in playing with you. Provide descriptive praise every 1-2 minutes to encourage continued engagement. Rotate materials as needed.

Part 1: Provide 3-5 sets of age-appropriate materials (e.g., blocks, books) and activities (e.g., set up game) around the room (based on family input and/or observations). Allow the child to engage with any materials/items. Follow the child's lead (no demands and engage in the same or similar behaviors as the child). The goal is to learn how the child typically communicates without adult support or prompts. Respond to all attempts to communicate by repeating the child and any other communicative behavior the child displays. This portion should last approximately 5 minutes depending on the child's interest.

Part 2: Repeat the above steps – during play model language the child can use during play. Use words, gestures, and body orientation (and AAC if used by the child). Respond to all attempts to communicate by repeating the child and any other communicative behavior the child displayed. This portion should last approximately 5 minutes.

Part 3: Repeat the above steps – during play provide 3-5 opportunities for the child to communicate using environmental arrangement strategies and wait up to 5 s for the child to communicate (longer if needed). This portion should last approximately 5 minutes. Respond to all attempts to communicate by repeating the child and any other communicative behavior the child displayed.

Transcription

When transcribing a language sample, record all verbal behaviors displayed by the child. In addition, transcribe the adult's verbal behavior too. Prior to recording child- and adult-level verbal behavior, record the context/activity (e.g., building blocks) then record what occurred during that interaction. If/when the activity shifts, record the new context/activity. Repeat this throughout. Using an Excel file or Word table, on each line for each utterance or sentence record the verbal behavior of the child or adult. Note "C" for child and "A" for adult before each utterance. When you cannot understand what was said record "xx" or if you only hear part of what was said and cannot understand the rest, write what you heard and use xx for any other part of the utterance or sentence. Record intelligible words or phrases/sentences (includes phonetic approximations of words).

Thus, if a word contains at least one sound or multiple sounds and you understand what the child said, record that word. Also, if clear, note if the child imitated (used part or all of a contextually-relevant word or phrase/sentence), echoed (repeated exactly, with no modifications [e.g., "I'm Justin" and child echoes the exact same sentence and says "Imjustin"]), or scripted (e.g., phrase or sentence that is from some form of media) to communicate. Any singing, animal sounds, or other environmental sounds should be noted but bracketed.

Analysis of Transcription

Use the transcription to gather relevant assessment information for the child.

- Count the total number of words that were intelligible.
- From that total, record the number of different words said (the first time a word is used).
- Calculate the mean length of utterance in morphemes and in words.
    - Morphemes: Total number of morphemes divided by the total number of utterances/sentences during the language sample.
    - Words: Total number of words divided by the total number of utterances/sentences during the language sample.
- Hadley and colleagues (2018, 2020, 2022, 2023) and Kaiser (2023) recommended recording the number of subjects, verbs, nouns, descriptive words, and other words (e.g., articles, conjunctions), as well as different early sentence combinations (i.e., *subject + main verb* and *subject + main verb + object*). Such information can influence our understanding of diversity of a child's language.

During the language sample, not how the child engages with toys (i.e., what does their play look like).

Appendix E

Data Sheet - Parent

Directions: Time stamp successes and attempts. For multi-step behaviors, mark time stamp at end.

Participant Initials: Condition: Session #: Data Collector:

	Occurrence of Behavior									
	1	2	3	4	5	6	7	8	9	10
Set 1										
Imitation: Engaged in the same or similar action as the child										
Time Stamp										
Expansion: Added toys or actions to the child's play within 1-3 s after the child engaged in a play behavior (related to the theme or context)										
Time Stamp										
Set 2										
Noticing and Responding										
Responded to communication within 1- 3 s										
Waited up to 5 s for a response										
Response was related to the context or activity										
Response was a grammatically correct sentence, unless responding to the child's question (could label)										
Time Stamp										
Set 3										
Describing the Child's Play										
Provided verbal model in the form of a relatively brief and grammatically correct sentence that described the child's play/actions										
Waited up to 5 s for the child to respond										
Time Stamp										
Describing Their Own Play										
Provided a verbal model in the form of a relatively brief and grammatically correct sentence that their own play/actions										
Waited up to 5 s for the child to respond										
The parent took a turn during the child's play routine, not simply did their own unrelated activity, and talked about it.										
NOTE: For both behaviors, we will accept anywhere between 3 and 5 s to allow for flexibility with how people count 5 s during a session.										
Time Stamp										
Set 4 Part 1 and 2										
EA (Part 1) & Teaching (Part 2)										
Provided appropriate EA										
If needed, provided a prompt (Part 2 only) - modeling procedure										
Waited up to 5 s for the child to express interest or respond to EA or Prompt										
If needed, provided a prompt after a delay (Part 2 only) - open-ended or time delay										
If needed, waited for the child to respond to the prompt (Part 2 only)										
Appropriate response: EA alone: If the child verbally communicated, the parent should respond appropriately (dependent on the EA the parent selected) by giving them the toy/item/engaging in an activity and/or verbally responding to the child's comment/statement, as appropriate OR discontinue if the child lost interest. EA + Procedure: Responded with expansion or recasted and gave the child access to the item/activity or discontinued if the child lost interest.										
NOTE: We will accept anywhere between 3 and 5 s to allow for flexibility with how people count 5 s during a session.										
Time Stamp										

NOTE: For multi-step behaviors, mark time stamp at end.

Appendix F

Online Parent Data and Fidelity of Sessions: Baseline and Maintenance

Parent/Caregiver & Child: _____

Date: _____ Time of Session: _ _ to _____

Condition: _____ Session #: _____

Preparation (check box to indicate this occurred)	
Started recording session via Zoom.	

Adult Response Codes	
Trainer	+ implemented, - did not implement

Trainer Fidelity	Correct Implementation				
Baseline Sessions					
Trainer explains that they want to see the parent play with the child as they normally would (or some variation of the phrase).					
Trainer provides no prompts or support to engage in target behaviors.					
Trainer answers any questions (outside of how to engage in behaviors) the parent asks.					
Parent engages with the child for 4 minutes.					
Number of training steps performed by trainer:					
Number of training steps not performed by trainer:					
Percentage of training implementation fidelity:					

Informal Tracking of Target Parent Behaviors- Tally by 4-min Session

Behavior 1:	**Behavior 2:**	**Behavior 3:**	**Behavior 4:**

Appendix G

Parent Data and Fidelity of Coaching Sessions: Asynchronous Training and Online Coaching

Parent/Caregiver & Child: _____
Trainer: _____
Date: _____ Time of Session: _____ to _____
Condition: _____ Session #: _____

Adult Response Codes	
Trainer	+ implemented, - did not implement

Preparation (check box to indicate this occurred)	
Ensured family had room/toys arranged for the session.	
Started recording session via Zoom.	
Parent confirmed they watched the training and reviewed materials	

Trainer Fidelity	Correct Implementation					
Initial Introduction and Modeling of Procedures						
Trainer briefly reviews the content of the asynchronous module.						
If teaching Set 2-4, remind the parent to combine what they have learned with what they are learning.						
Trainer asks parent if there are questions (answers/offers support accordingly).						
Parent practices procedures with child (4 minutes) – this process repeats for the remainder of the visit. Secondary team member is recording the session and noting successes and areas of growth (can occur on MacBook, iPhone, or iPad) - will share their screen in step two below.						
Primary trainer provides behavior specific praise for observed target behaviors and secondary trainer records practice session. This occurs throughout the 4-minute session.						
Secondary observer records session, notes examples and non-examples, and then shows the parent the video and provides 1-2 examples of what went well (adhered to plan) and, if needed, 1-2 examples of areas for improvement (2-3 minutes max).						
Primary trainer asks if the parent would like to see a live or video model (brief; 1 min max) and if they have any questions (answer based on plan, as needed) (1-2 minutes max).						
Primary trainer tells parent to practice again.						
End of Visit/Wrap Up - Primary Trainer						
Primary/Secondary discuss parent's progress.						
Primary/Secondary discuss next steps with parent.						
Number of training steps performed by trainer:						
Number of training steps not performed by trainer:						
Percentage of training implementation fidelity:						

Informal Tracking of Target Parent Behaviors- Tally by 4-min Session

Behavior 1:	**Behavior 2:**	**Behavior 3:**	**Behavior 4:**

Note: If an online check-in session occurred after this appointment, note the date and time what was discussed, as well as the length of the visit.

Appendix H

Parent Data and Fidelity of Sessions: Coordination of Skills

Parent/Caregiver & Child: _____

Date: _____ Time of Session: _ _ to _____

Condition: _____ Session #: _____

Preparation (check box to indicate this occurred)	
Started recording session.	

Adult Response Codes	
Trainer	+ implemented, - did not implement

Trainer Fidelity	Correct Implementation					
Parent practices procedures with child (4 minutes) – this process repeats for the remainder of the visit. Record the session and note successes and areas of growth (can occur on MacBook, iPhone, or iPad). Also, can provide parent a handout they can refer to during the session.						
No coaching provided during the 4-min session.						
At end of session, the trainer shows the parent the video and, if needed, provides 1-2 examples of what went well (adhered to plan) and 1-2 examples of areas for improvement (2-3 minutes max).						
The trainer asks if the parent would like to see a live or video model (brief; 1 min max) and if they have any questions (answer based on plan, as needed) (1-2 minutes max).						
Primary trainer tells parent to practice again (if needed).						
End of Visit/Wrap Up - Primary Trainer						
Discuss parent's progress.						
Discuss next steps with parent.						
Number of training steps performed by trainer:						
Number of training steps not performed by trainer:						
Percentage of training implementation fidelity:						

Informal Tracking of Target Parent Behaviors- Tally by 4-min Session

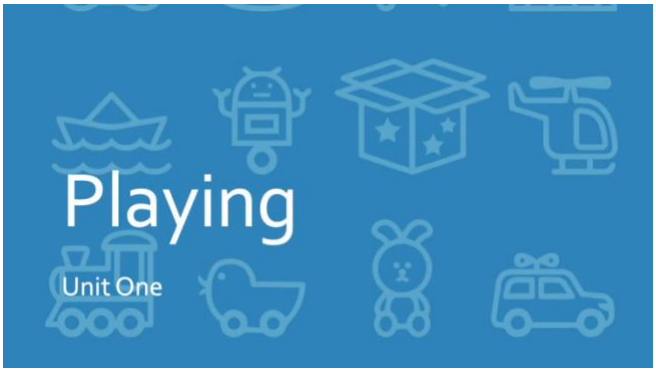
Behavior 1:	**Behavior 2:**	**Behavior 3:**	**Behavior 4:**

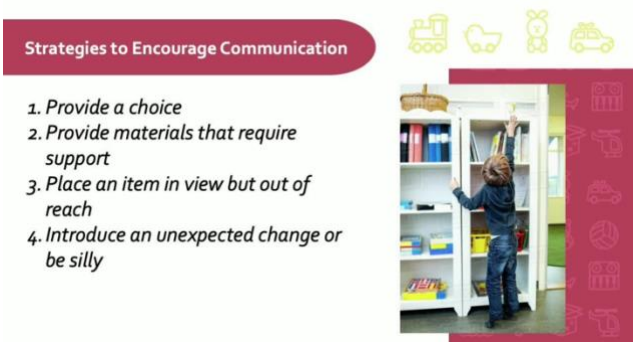
Appendix I

Child-level Behavior Definitions

Responding to Parent
General/Context: Responses are child-level verbal communication that occurs within 5 s of a parent's question, cue, or prompt to communicate. If a parent provides the same question, cue, or prompt multiple times in rapid succession within a 5 s window, it is functionally treated as one opportunity (e.g., repeated same question within a 0.5 to 1 s until the child noticed). At least 5 s must elapse before a parent's communication counts as a separate instance or opportunity for the child. The exception to this was when the parent and child are engaged in a conversation (e.g., parent asked a question, child responded, repeated); during a conversation each parent question, cue, or prompted is treated as separate opportunities for the child to respond. ***Verbal Communication***: Refers to any isolated consonant or vowel sounds, single words or word approximations, or word combinations. This includes protesting (e.g., child kept item and said, "I do [it]") at a typical conversational tone or volume. False starts and repetitions are counted as a single response (counted the first instance) unless there are at least 4 s between the ending of one word or phrase and the beginning of another. A non-example is the child screaming or yelling.
Initiating to Parent
General/Context: Initiations are child-level verbal communication independent of a parent's question, cue, or prompt for the child to communicate. An initiation is recorded if more than 5 s elapsed between the parent's previous question, cue, or prompt and the child's communication. If the parent and child are not engaged in the same activity (e.g., parent is oriented away from the child and/or not watching the child play) and the child verbally communicates (e.g., isolated vowel sound), the child must orient part or all of their face or body toward the parent within 3 seconds. Communication (without orientation toward parent) is recorded if the parent and child are engaged in the same activity, using the same or similar materials in proximity of one another. ***Verbal Communication***: Identical to the information provided in the *Responding to Parent* section: Count as a single response (count the first instance) unless there is at least 4 s between the ending of one word or phrase and the beginning of another.

Appendix J


Playing
Unit One


Strategies to Encourage Communication
1. Provide a choice
2. Provide materials that require support
3. Place an item in view but out of reach
4. Introduce an unexpected change or be silly


"Want Baby"
"Ba Ba"

Appendix K


CREATE an opportunity for communication.
WAIT a few seconds for Adelia to use a word.
RESPOND by repeating what she said or by adding words to what she said.
If she does not but is still interested, provide continued attention and give the item or begin the activity.
CREATE an opportunity for communication.
*DEMONSTRATE as soon as Adelia is interested - say one word you would like her to copy, like the name of a toy or an action word.
WAIT a few seconds for Adelia to copy what you said.
RESPOND by repeating what she said or by adding words to what she said.
If she does not but is still interested, provide continued attention and give the item or begin the activity.

Appendix L


PLAY
Copy Adelia's play
Add to her play
DESCRIBE
When Adelia is playing...
Describe the play by naming the toy or activity and the action with the toy.
Wait for a few seconds for a response.

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