

The Pennsylvania State University

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**COACHING PARENTS OF YOUNG CHILDREN WITH AUTISM AND MINIMAL TO  
NO VOCAL SPEECH IN NATURALISTIC DEVELOPMENTAL BEHAVIORAL  
STRATEGIES USING STRENGTH-BASED VIDEO FEEDBACK**

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by

Ciara Lyn Ousley

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The dissertation of Ciara Lyn Ousley was reviewed and approved by the following:

Tracy J. Raulston  
Former Assistant Professor of Education  
Dissertation Advisor and Chair of Committee

David McNaughton  
Professor of Education

David Lee  
Professor of Education

Jessica Caron  
Assistant Professor of Communication Sciences and Disorders

Pamela Wolfe  
Associate Professor of Education

## ABSTRACT

One out of every 54 children receive a diagnosis of autism spectrum disorder (ASD) and approximately 30% of those children do not develop functional vocal speech by the age of four. Previous research has demonstrated that parents of young children with ASD can be trained to implement naturalistic developmental behavioral intervention strategies with fidelity when follow-up coaching is provided, leading to cascading increases in child social communication skills *and* parent self-efficacy. A concurrent multiple-baseline single case design across five parent-child dyads (i.e., two mothers and three fathers) was employed to evaluate the effects of strength-based video feedback coaching, a coaching tool that capitalizes on Bandura's Social Learning Theory, on (a) parent strategy use, (b) child social communication, and (c) parent self-efficacy. An additional coaching package was introduced to parents who did not meet a predetermined criterion. Visual analysis and supplemental standardized mean difference and nonoverlap analyses revealed a functional relation and strong effects for parent strategy. No functional relation or statistically significant change were present between the intervention on child social communication skills or in parent-reported self-efficacy measures.

*keywords:* parent-implemented interventions, naturalistic developmental behavioral interventions, social communication, autism spectrum disorder

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I hope you let the injustices be fuel to your fire.

## CHAPTER 1

### INTRODUCTION AND LITERATURE REVIEW

According to the most recent data from the Centers for Disease Control, 1 out of every 54 children receive the diagnosis of autism spectrum disorder (ASD; Maenner et al., 2020) and of those children about 30% do not develop functional vocal speech by the age of four (Wodka et al., 2013). ASD is a developmental disability that is characterized by (a) delays in social communication and (b) the presence repetitive and restrictive behaviors (American Psychological Association, 2013). Social communication is the use of language within social contexts, including social interactions, and is required for language expression and perspective taking (The American Speech-Language-Hearing Association, n.d.). Deficits in social communication (e.g., eye contact, verbal and non-verbal communication) that many young children on the autism spectrum experience may lead to cascading problems including the escalation of challenging behaviors (Machalicek et al., 2016) and a lack of reciprocal friendships with peers (Kasari et al., 2011). If left untreated, these challenges may persist into adulthood, resulting in poor outcomes for community inclusion and independent living (Gray et al., 2014). Fortunately, early interventions may result in increases in social communication for children with ASD (Fuller & Kaiser, 2020). In fact, children who receive early intervention demonstrate better outcomes in language (Hampton & Kaiser, 2016), friendships (Freeman et al., 2015), and academic functioning in school (Lang et al., 2016). Training parents to implement early interventions can lead to increases in young children on the autism spectrum's social communication skills (Fuller & Kaiser, 2020) by empowering families to embed evidence-based strategies into their everyday routines (Division for Early Childhood, 2014; National Research Council, 2001). However, it is critical for professionals to provide follow-up parent coaching to

increase generalization of skills to different contexts and partners (Lang et al., 2016) and ensure parents continue to implement interventions with fidelity (Meadan et al., 2016).

### **Early Intervention**

Part C of the Individuals with Disabilities Education Act (IDEA, 2004) requires states to identify and evaluate young children with social communication delays through *Child Find*. Once a child is classified as not meeting developmental milestones, they begin receiving services through early intervention. Early interventions should be delivered as soon as the delay is identified and occur in naturalistic settings, such as the home (Division of Early Childhood, 2014; National Research Council, 2001).

### ***Parental Involvement in Early Intervention***

Given the importance of parent-child playtime interactions, especially during early child development (Bronfenbrenner, 1979), training parents to implement strategies to support their child's social communication skills is paramount to successful early intervention (Hume et al., 2021). Indeed, best practice in early intervention not only involves providing effective intervention for children with delays but includes training the parents of children with disabilities to implement the strategies with fidelity (Campbell & Halbet, 2002). Further, IDEA (2004) and the Division of Early Childhood (DEC, 2014) recommend early interventionists prioritize empowering parents to increase their self-efficacy when working with their child.

**Parent Self-Efficacy and Empowerment.** Consistent with Bandura's theory of self-efficacy, Karst and Van Hecke (2012) suggested that targeting the self-efficacy of parents of children with ASD is critical for long-term intervention success. Specifically, parents who believe in their abilities to effectively work with their child (i.e., self-reported high self-efficacy) are more likely to implement their child's intervention plan with fidelity and see increased results

in their child's behavior (Jones & Prinz, 2005; Sofronoff & Farbotko, 2002). As such, it is recommended that early interventions involving parents are rooted within an empowerment model (Bruinsma et al., 2020; Turnbull & Turnbull, 2001) to increase parental self-efficacy and capitalize on parents being an equal partner within the parent-interventionist relationship.

Empowerment of parents of children with developmental disabilities is a construct that is synergistic in nature (Hsiao et al., 2018). The interventionist and parent must build a partnership with the child at the center of the connection (i.e., mesosystem of a child; Bronfenbrenner, 1979). Together, the parent and interventionist identify where the parent is currently performing and work together and highlight the parent's ability to accomplish and influence their child's performance (Hsiao et al., 2018; Yukl & Becker, 2012).

Dillenburger and colleagues described the impact that applied behavior analysis (ABA), a science with a strong evidence-base of interventions for children with ASD (Hume et al., 2021), had on parents of children with ASD. Their results, deriving from several empirical studies, indicated that training parents to incorporate ABA-based interventions with their child not only increased the child's performance, but also empowered the parent. Specifically, parents described that ABA helped the entire family unit become closer, a critical component of behavioral change (Bronfenbrenner, 1979). Further, one parent shared that ABA had, "given me hope that I can improve my daughter's life without being dependent on professionals and their opinions" (pg. 218; Dillenburger et al., 2002). In summary, research has identified parent-implemented interventions rooted within the science of ABA as an evidence-based practice (Hume et al., 2021) with positive effects on (a) parental wellbeing (e.g., self-efficacy) and (b) child social communication.

## **Naturalistic Developmental Behavioral Interventions**

The term *naturalistic developmental behavioral interventions* (NDBIs) is used to describe strategies based in ABA and developmental psychology that are child-led and occur within natural settings (e.g., homes) to support social communication development in young children with ASD (Schriebman et al., 2015). These interventions have a strong and rapidly growing evidence-base and are becoming more popular within the field of early intervention (Hampton & Sandbank, 2021). NDBIs blend ABA-based (e.g., antecedent manipulation, natural reinforcers) and developmentally-based (e.g., scaffolded supports, language modeling) approaches (Bruinsma et al., 2020). These blended strategies are often embedded into playtime routines and involve following the child's lead (e.g., playing with the toy that the child is interested in); imitating the child's play actions (e.g., rolling a ball after the child rolls a ball); modeling developmentally-appropriate language (e.g., saying "ball" as opposed to complex sentences); and providing natural reinforcement to the child after communication attempts (e.g., giving the child the ball after they say "ball"). Play is a particularly powerful routine in which to intervene because child motivation is high, creating ample learning opportunities for young children (Raulston et al., 2020, 2021). Furthermore, embedding NDBIs into play offers many opportunities for relationship building and bonding between parents and children (Dillenburger et al., 2002).

### **NDBIs Delivered via Telepractice**

Many families of young children with ASD experience a number of barriers to accessing quality parent training. Families have reported (a) receiving less service time than what is recommended (Hebbler et al., 2007; McIntyre & Zemantic, 2017); (b) experiencing financial constraints of costly in-person therapies (Raulston et al., 2019); and (c) navigating through difficulties coordinating multiple schedules (e.g., practitioner, parent, child; Simacek et al.,

2020). Thus, there is a need for a more effective, efficient, and accessible approach in order to provide or supplement parent training.

Telepractice services are those that occur remotely via a secure, online platform and provide several benefits. First, telepractice removes the travel-time required of in-person early intervention practitioners or families of children with ASD resulting in more flexibility with scheduling (Simacek et al., 2020). By removing commute time, early intervention practitioners may become available to more families of children with ASD, resulting in overall greater access to high-quality early intervention services (Marino et al., 2020). Second, early intervention practitioners who deliver their services via telepractice can capitalize on training parents to embed strategies into their existing family routines (Hume et al., 2021). By regularly incorporating services within naturally-occurring routines and activities, children with ASD are able to receive increased intervention time (i.e., parents can implement strategies throughout the day, rather than a restricted window of time an in-person, interventionist-led session would) with natural communication partners (e.g., parents), environments (e.g., home settings), and activities (e.g., playtime; Simacek et al., 2020). Finally, telepractice-based coaching can reduce the cost of early intervention services without sacrificing the effectiveness of those services (Lindgren et al., 2016). Financial concerns are critical to consider as parents of children with ASD often have concerns with the cost of therapy (Raulston et al., 2019).

### ***Training Parents on NDBIs via Telepractice***

Parents can be trained to implement NDBIs within the context of natural play routines (Akemoglu & Meadan, 2018; Raulston et al., 2016, 2020), including when the training occurs online (Akemoglu et al., 2020). When parents implement NDBI strategies proficiently and regularly, improvements in child communication, language, joint attention, and play skills can be

achieved (Hampton et al., 2020, 2021; Roberts & Kaiser, 2011; Rakap & Rakap, 2014). In addition to the aforementioned child improvements, parents often increase their self-efficacy and feel empowered (Meadan et al., 2016).

While interventions that actively involve parents result in better child outcomes when compared to those that do not (Hampton & Kaiser, 2016), follow-up parent coaching (i.e., continued feedback on performance) is necessary to refine skills, increase confidence, and strengthen treatment fidelity (Meadan et al., 2016). Neglecting to train *and* coach parents may result in decreased generalization of communication skills to different contexts and communication partners (Lang et al., 2009). For example, in 2016, Meadan and colleagues evaluated the effects of training parents on implementing three NDBIs (i.e., environmental arrangement, modeling language, mand-models, time-delay) with their young children with ASD. While some parents were able to increase their strategy usage after training, strategy use was variable. As such, the authors introduced additional coaching consisting of: (a) plan development, (b) post-observation feedback, and (c) delayed video feedback. Immediate effects were seen with parental strategy use, and parental sense of empowerment increased.

Both parent training *and* follow-up coaching sessions should involve a synchronous interaction between the coach and parent to encourage reflective, collaborative conversations (Bruinsma et al., 2020). Following initial training on NDBI strategies, parents should be regularly coached to ensure the parent is implementing the targeted strategies with fidelity (Meadan et al., 2016).

### **Video Feedback Coaching**

Following Bandura's Social Learning Theory (Bandura, 1986), *video feedback coaching* is a strength-based approach that accentuates the parent's role during interventions with their

child. This type of coaching involves a parent and coach (e.g., early intervention practitioner) viewing a pre-recorded parent-child interaction together (Balldin et al., 2018). Throughout the viewing, the coach may pause or replay portions of the video to highlight positive interactions and reflect on missed opportunities. First introduced to improve parent-child interactions in the 1970's (Stern, 1971), it is argued that parents are more likely to devote attention to videos displaying themselves as the “positive model” of strategy implementation, as opposed to viewing an expert flawlessly utilizing strategies with an unknown child (Fuller & Manning, 1973). Video feedback coaching has been successful with increasing positive parenting behaviors (e.g., descriptive praise, responsivity; Poslawsky et al., 2015) and decreasing maladaptive parenting behaviors (e.g., intrusiveness during play interactions; Phaneuf & McIntyre, 2007).

### ***Video Feedback Coaching for Parent-Implemented NDBIs***

Traditional parent coaching strategies within parent-implemented NDBIs occurring via distance learning vary greatly (Akemoglu et al., 2020). Akemoglu and colleagues conducted a systematic review of the literature and found that coaching methods included self-directed trainings, joint planning and problem solving, modeling (live and via video modeling), prompting, reflection, goal setting, progress reviewing, written summaries of intervention components, role plays, and feedback. Studies ranged from no coaching method (Douglas et al., 2018) to targeting one (e.g., problem solving; Wainer & Ingersoll, 2015) or several coaching methods (e.g., discussion, progress reviewing, joint planning, role play, video modeling; Vismara et al., 2012). Few studies have included video feedback within a coaching package on parent-implemented NDBIs (Akemoglu et al., 2021; Meadan et al., 2016; Wattanawongwan et al., 2020), yet many utilize videos with experts implementing strategies, requiring parents to

generalize generic examples or expert videos to their own child and environment (Akemoglu et al., 2020).

There is preliminary evidence that video feedback coaching can successfully be integrated within a play-based NDBI and increase parent strategy use. For example, Wattanawongwan and colleagues trained parents to incentivize communication, model, prompt, incorporate a progressive time delay, and expand child communication. Follow-up coaching included written feedback, praise statements, graphs, role-plays, answering questions, and verbal feedback while jointly reviewing parent-recorded videos. All parents demonstrated increases in strategy use, and all children were able to increase their communication. However, given the robust coaching program, it is unknown how video feedback alone may impact parent-implementation of NDBI strategies.

One dissertation study has explicitly evaluated the effects of video feedback coaching during a parent-implemented social communication intervention. Ence (2012) investigated the effects of video feedback coaching with three parents of children with ASD who failed to demonstrate fidelity with a prior NDBI intervention, pivotal response training. In other words, video feedback coaching was utilized as an intensive tier support for parents who were not meeting fidelity criteria. Parent implementation of strategies increased to 100% fidelity following video feedback coaching. This research demonstrated that video feedback alone may be a promising coaching methodology for parents who require additional coaching beyond typical in-vivo verbal feedback.

### **Pilot Study**

A pilot study for the current investigation was conducted from November 2020 to March 2021. Three parents of children with ASD, William's Syndrome, and a speech delay were trained

on 5 NDBIs: (a) follow and imitate; (b) model language; (c) environmental arrangement; (d) wait time; (e) reward and expand. Following a one-hour training, the coach (doctoral student proposing the current dissertation) met with parents and children via Zoom twice weekly during 10-minute play sessions. The coach began each session by showing weekly video feedback highlighting three positive examples of the parent implementing strategies and one area of focus. The coach was quiet for the entirety of the 10-minute session. At the conclusion of each session, the coach asked parents to self-reflect on the session, and encouraged the parents by highlighting a positive interaction that occurred during that session. All three parents were able to increase their strategy use.

### **Filling the Research Gaps**

Parent-implemented NDBI is an evidence-based practice to build social communication skills for young children with ASD (Hume et al., 2021) and can successfully be implemented via telehealth (Akemoglu et al., 2020). Embedding empowerment-based practices within interventions may lead to an increase in fidelity on parent-implemented interventions (Dillenburger et al., 2002; Hsiao et al., 2018). With its robust history (Stern, 1971) and theoretically-sound approach (Bandura, 1986; Bronfenbrenner, 1979; Jones & Prinz, 2005; Kurzok et al., 2021), strength-based video feedback coaching has the potential to be a more efficient and accessible service delivery system for parent-implemented social communication interventions as it capitalizes on empowerment and self-efficacy. Despite this theoretically-sound evidence to support strength-based video feedback coaching, to date, there are no peer-reviewed investigations explicitly evaluating the effects of video feedback coaching (i.e., not a part of a coaching package) on parent-implemented interventions targeting social communication skills, a key area of need for children with ASD.

Most published research on telehealth-based parent-implemented NDBIs have required the parent-child interactions to occur during a “live” meeting with the researcher (i.e., synchronous meeting; Akemolglu et al., 2020), which can pose scheduling challenges. Only one research study has involved parents self-recording interactions between themselves and their child at a time that is convenient for the family throughout the duration of the study (Wattanawongwan et al., 2020). Given the challenges faced by families with children who have ASD, allowing the parent to self-record interactions may allow the early intervention practitioner to capitalize on opportunities during routines when service providers are not typically in the home (e.g., weekend activities, evenings, playdates). Providing feedback on parent-recorded interactions may provide a solution to the scheduling conflicts (Raulston et al., 2019; Simacek et al., 2020) and COVID-19 stressors (Manning et al., 2020) often felt by families who have children with ASD.

### ***Current Study***

The current study was selected for funding by *The Organization of Autism Research* Graduate Student Research grant. The present study seeks to expand the aforementioned pilot study by: (a) evaluating the effects of strength-based video feedback without guided parent self-reflection, and (b) allowing parents to capture play time interactions with their child asynchronously (i.e., without having to meet with the researcher on an online platform). Further, parental self-efficacy will be measured pre- and post-intervention to identify any change in the parent’s confidence in supporting their child’s social communication skills, and parental perception of the effectiveness and social validity of coaching parents using parent-recorded videos of parent-child interactions during play will be evaluated.

Together, it is hypothesized that the training and video feedback coaching will empower parents of children with ASD to implement NDBI strategies during play routines. There are three unique aspects to the project, which are based upon theoretically-sound best-practices for early intervention telehealth services. Each component addresses how the current intervention package can provide a more efficient and accessible service delivery method, respectively:

1. Providing a synchronous, collaborative, and individualized training via telehealth video conference to build parent-coach partnerships
2. Supporting schedule flexibility by allowing parents to self-record parent-child interactions at a convenient time, and
3. Delivering individualized coaching feedback (during telehealth video conferences) using videos uploaded by the parent.

## CHAPTER 2

### METHOD

The purpose of the present project was to evaluate the effectiveness of video feedback coaching, following an initial parent training, on parental implementation of NDBI strategies (see Table 1 below for strategy descriptions) and individualized child social communication learning targets (e.g., word approximations, gestures). A concurrent single-case multiple baseline design was employed across five parent-child dyads. Data were collected using parent-recorded 10-minute play sessions with their child. Visual analysis and standardized effect sizes were calculated on all dependent variables, and social validity data were evaluated with all five parent participants. The current project addressed the following empirical questions:

1. Is there a functional relation between a telepractice-based training and weekly strength-based video feedback coaching on parent-implemented NDBI strategies during home play sessions?
2. Is there a functional relation between a telepractice-based parent-implemented NDBI intervention on child social communication learning targets?
3. Is there a functional relation between an additional coaching package (i.e., self-reflection, goal setting, and scenario-based discussions) on parent implementation of NDBI strategies for parents who do not meet a predetermined criterion?
4. Is there a functional relation between an additional coaching package (i.e., self-reflection, goal setting, and scenario-based discussions) on child social communication learning targets?
5. How will parents perceive the acceptability, feasibility, and effectiveness of the telepractice-based intervention?

6. Will parent reported levels of self-efficacy increase following delivery of the intervention package?

**Table 1**

*Operational Definitions and Examples for the Five NDBI Strategies Targeted*

<b>Strategy</b>	<b>Definition</b>	<b>Example</b>
<i>Follow</i> and imitate the child	Focusing on toys or activities that are of interest to the child and playing in a similar way as the child does	If the child splashes hands in the water, the parent splashes their hands in the water, too.
<i>Model</i> language at the child's communication level	Vocalizing or gesturing (depending on child communication level) vocabulary related to the toys or activities	Parent says, "Splash!" as they pat the water with their hands.
<i>Arrange</i> the environment	Modifying items in environment (e.g., people, toys) that requires communication to access	Parent splashes the water with their hands, then pauses the splashing by hovering their hands over the water.
<i>Wait</i> at least 3 seconds	Looking expectantly (e.g., eyebrows raised, arms/hands up) at child and waiting 3-5 seconds	While hovering their hands over the water and pausing, the parent looks at the child with an expectant look followed by 3-5 seconds of silence.
<i>Reward</i> and expand the child's communication	Providing child with natural reinforcement (e.g., desired item or action) and saying the vocabulary associated with the reinforcer one step-above the child's social communication learning target level.	When the child raises their hands and vocalizes (e.g., "pash") the parent splashes the water again and says, "Splash the water!" with enthusiastic affect.

*Note.* These examples are based upon an example of a parent-child dyad playing together with a rubber pool filled with water and floating animal toys. The child uses communicative gestures and a few word approximations to request items, actions, and their caregiver's attention.

## Participants and Setting

Upon approval from the researchers doctoral committee, university's review board, and granting agency, parent-child dyads were recruited across the United States via social media platforms (e.g., Facebook disability parent groups) and local preschools using a recruitment flyer (See Appendix A). Parent-child play sessions were self-recorded by the parent within their home during naturally occurring play activities (e.g., playing with toys, dancing to music, baking a cake) using a researcher-supplied tablet and tripod (funded by *The Organization from Autism Research* Graduate Research grant). To be eligible to participate in the study, the parent-child dyads were required to (a) have access to the Internet, (b) be able to capture 10-minute play sessions one to three times per week, and (c) be able to commit to the study for 9 to 15 weeks.

Additional parent eligibility criteria included that the parent be (a) 18 years of age or older and (b) the legal parent of a child with an ASD diagnosis who presents with social communication deficits according to the *Vineland Adaptive Behavior Scale-3* (VABS-3; Sparrow et al., 2016). See child criteria below for specificity on what indicated a social communication deficit for the purposes of this study. Further, the parent had to be able to commit to a one-time synchronous 1-hour training as well as one 30-minute synchronous meeting per week for video feedback with the researcher upon entering the intervention phase(s).

Additional child criteria included that the child (a) be between 2 and 5 years old; (b) have a formal medical diagnosis or special education eligibility of ASD or be at-risk for ASD; (c) and score at least 1.5 standard deviations below their aged norm according to the communication composite of the *VABS-3*. Children who used (a) augmentative and alternative communication (AAC; e.g., speech-generating device); (b) few vocal words; or (c) several vocal words were eligible.

Five parents of children with ASD and minimal vocal speech contacted the researcher via e-mail, phone call, or text messaging. All five parents were screened and qualified. See Table 2 for demographic information.

***Dyad 1: Atticus and Jem***

Atticus (father; 35 years old) and Jem (son; 4 years old) contacted the researcher after receiving a recruitment flyer from a friend. Jem lived with his mother and father in the Mid-Atlantic portion of the United States. Atticus was a disabled veteran and worked full-time. Jem received a medical diagnosis of ASD at the age of 2 and communicated using vocal speech that was mostly echoic. Atticus shared that a communication device (i.e., LAMP Words for Life) was used at school and preferred that vocal speech be targeted for the current research study.

***Dyad 2: Danny and DJ***

Danny (father; 45 years old) and DJ (son; 4 years old) contacted the researcher upon seeing the recruitment flyer on a social media group page. DJ lived with his father, mother, and grandmother in the Northeastern portion of the United States. Danny worked full-time. DJ received an ASD diagnosis by a psychiatrist and behavioral psychologist at the age of 2. DJ used minimal gestures and was beginning to use the Picture Exchange Communication System (PECS) to communicate (e.g., exchanging a laminated picture card of a cookie for a cookie after completing a task). Danny shared that DJ had said some word approximations in the past (e.g., “ma” for *more*) but did not use vocal word approximations consistently.

***Dyad 3: Meredith and Bailey***

Meredith (mother; 44 years old) and Bailey (son; 2 years old) contacted the researcher after seeing a flyer on a social media group page. Bailey lived with his mother, father, and two sisters in the Mid-Atlantic portion of the United States. Meredith was a stay-at-home mother.

Bailey received a medical diagnosis six months prior to the beginning of the study at the age of 2. Bailey primarily used gestures (e.g., tapping a letter on an alphabet rug to ask Meredith to say the letter and sound) to communicate. Meredith shared that manual signs were used previously with little success, and Bailey was beginning to use word approximations for letter names and animal sounds.

#### ***Dyad 4: Daetreon and Adrian***

Daetreon (father; 60 years old) and Adrian (son; 4 years old) received a flyer from Adrian's preschool teacher. Adrian lived with his mother, father, brother, and sister in the Mid-Atlantic portion of the United States. Adrian received a medical diagnosis of ASD at the age of 2 and had other medical concerns (e.g., detached retina, feeding tube) due to a very early delivery. Adrian had no functional vocal speech and used an iPad tablet with the LAMP Words for Life application to communicate. Adrian was literate and used both icons and a keyboard on his AAC system to communicate.

#### ***Dyad 5: Diana and Harry***

Diana (mother; 30 years old) and Harry (son; 4 years old) contacted the researcher after receiving a flyer from her master's program. Harry lived with his mother, father, and brother in the Pacific Northwest in the United States. Harry was diagnosed with ASD by a developmental pediatrician at the age of 2. He relied on vocal speech and challenging behavior to communicate. Diana stated that Harry was beginning to imitate words and sounds and had few independent vocal communications (e.g., "nana" for *banana*).

### **Materials**

The researcher mailed each parent a tripod and a Samsung Galaxy Tab A7 tablet that was programmed to be capable of recording and directly uploading 10-minute parent-recorded

interactions to a secure online storage system (i.e., Microsoft OneDrive or Zoom). The tablet, tripod, and postage were funded through *The Organization of Autism Research* Graduate Research Grant. The parent training was created by the lead investigator using PowerPoint™. Video feedback was created using the iMovie (version 10.1.12) application on a MacBook. The researcher sent a self-reflection journal and printed and laminated procedures to all parents. See procedures for additional detail.

### **Research Design**

Given that the aim of the current project was to understand individual behavior change, a single-case multiple-baseline across parent-child dyads design was employed (Ledford et al., 2018). This combined-series design is appropriate when evaluating the same intervention across three or more different participants, as each participant serves as their own control. Best practice for multiple baseline designs were employed. There were three sequential concurrent replications of the intervention effect (i.e., baseline to intervention comparisons), systematically staggered across time, to demonstrate a functional relation and experimental control (Ledford et al., 2018).

The study consisted of four phases, all of which occurred remotely. Three phases were implemented for all dyads: baseline (i.e., no training or coaching); strength-based video feedback coaching (i.e., an initial training followed by weekly virtual coaching meetings between the researcher and parent using strength-based video feedback); and 2-week, 4-week, and 6-week

**Table 2***Demographic Information*

	Relation	Age (years)	Race/Ethnicity	Annual Household Income (number of household members)	Parent Education	Parent Employment Status
Dyad 1						
Atticus	Father and son	35	White/Non-Hispanic	\$70,000 - \$80,000 (3)	Associates degree	Full time
Jem		4	White/Non-Hispanic			
Dyad 2						
Danny	Father and son	45	White/Non-Hispanic	\$90,000 + (4)	Graduate degree	Full time
DJ		4	White/Non-Hispanic			
Dyad 3						
Meredith	Mother and son	44	White/Non-Hispanic	\$40,000 - \$50,000 (5)	Some college	Homemaker
Bailey		2	White/Non-Hispanic			
Dyad 4						
Daetreon	Father and son	60	NR/Hispanic	\$90,000 + (5)	High school	Self-employed
Adrian		4	Asian/Hispanic			
Dyad 5						
Diana	Mother and son	30	White/Non-Hispanic	\$30,000 - \$40,000 (4)	Bachelors degree	Full time
Harry		4	White/Non-Hispanic			

*Note.* NR = no response

maintenance (i.e., no training or coaching). Maintenance data will be reported in peer-reviewed publication of the current study. An additional coaching package was provided to dyads, following the strength-based video feedback coaching phase, who did not meet a predetermined criterion. This additional coaching package included the continuation of strength-based video feedback and addition of weekly goal setting, a session self-reflection journal, and scenario-based discussions on how to embed each strategy within playtime with their child. The predetermined criterion was defined as parental strategy use falling below 65% of intervals for at least 4 out of first 6 consecutive probes. Criterion was determined based upon the pilot study. The mean parental strategy use across all parents in pilot study was 65% of intervals. The criterion of four out of six consecutive probes was chosen to allow for the parent to be able to view 2 to 3 different weeks of strength-based video feedback coaching.

Baseline began concurrently for all parent-child dyads, with a minimum of 5 data points for each tier. Vertical (i.e., comparison of data between parent-child dyads) and horizontal (i.e., comparison of data within the parent-child dyad) analyses occurred to evaluate the stability of the data (i.e., parent behaviors were not increasing nor variable). The parent with the most stable baseline data entered intervention while the other dyads remained in baseline. After a treatment effect was established (i.e., at least three intervention sessions with data consistently above baseline data; Ledford et al., 2018), vertical and horizontal analyses were conducted to evaluate the stability of data within and between tiers. Then, to prevent dyads from experiencing an elongated baseline, the next two parent-child dyads entered the first phase of intervention (i.e., three of the five dyads were in intervention). This process was replicated for the final two parent-child dyads for the third replication of the treatment effect. All dyads received at least four-weeks of intervention.

### *Variables*

The independent variable was a one-hour individualized parent training and weekly strength-based video feedback coaching sessions between the researcher and parent. Video feedback included shorted clips of the previous weeks' 10-minute parent-recorded videos of parent-child interactions during play routines and highlighted three positive examples of parent NDBI strategy usage. An additional coaching package was introduced for parents who did not reach criterion with the first intervention phase (i.e., four out of the first six consecutive sessions with strategy use at 65% or higher percentage of intervals).

The primary dependent variable was parent implementation of NDBI strategies. Data were collected using 10-second partial-interval recording. Partial interval recording is appropriate when collecting data on multiple behaviors (i.e., several strategies) at the same time (Cooper et al., 2020). See Appendix B for parent behavior data collection sheets.

The secondary dependent variable was frequency of individualized child social communication learning targets. The researcher triangulated the assessment data with the child's IFSP or IEP goals and parent goal, to identify an ecologically-valid short-term social communication learning target. The lead researcher collaborated with the parent to identify the child's current communicative zone of proximal development (Vygotsky, 1978) and determined a developmentally appropriate social communication learning target. Further, the topographical mode of communication (i.e., vocal speech or AAC) identified by the parent and the child's IFSP/IEP team (e.g., early interventionist, speech language pathologist) was utilized in the study. See Table 3 for operational definitions of each child's individualized social communication learning target. See Appendix C for child social communication data collection sheets.

**Table 3***Operational Definitions and Examples of Child Social Communication Learning Targets*

Child	Modality(ies)	Definition	Example
Jem	Vocal speech	Vocally says one word or short phrase	“catch!” “1, 2, 3 slide!”
DJ	Gestures	Extends one or both arms toward parent with open palms. Six inches of space must be between parent and child upon reach	Reaches to dad to request high jumps on trampoline
	Vocal speech	Vocally says a word approximation (i.e., at least one correct phoneme of a single word)	“/oo/” for <i>blue</i> “ma” for <i>more</i>
Bailey	Vocal speech	Vocally says word, letter name, animal sound, or word approximation (i.e., at least 1 correct phoneme of a single word)	“b” “ball”
Adrian	AAC use	Independently says word or phrase by activating (i.e., touching) AAC system via icon or keyboard.	“green eyes” “a-l-l d-o-n-e”
Harry	Vocal speech	Vocally says a word or word approximation (i.e., at least 1 correct phoneme of a single word)	“bubu” for <i>bubble</i> “go”

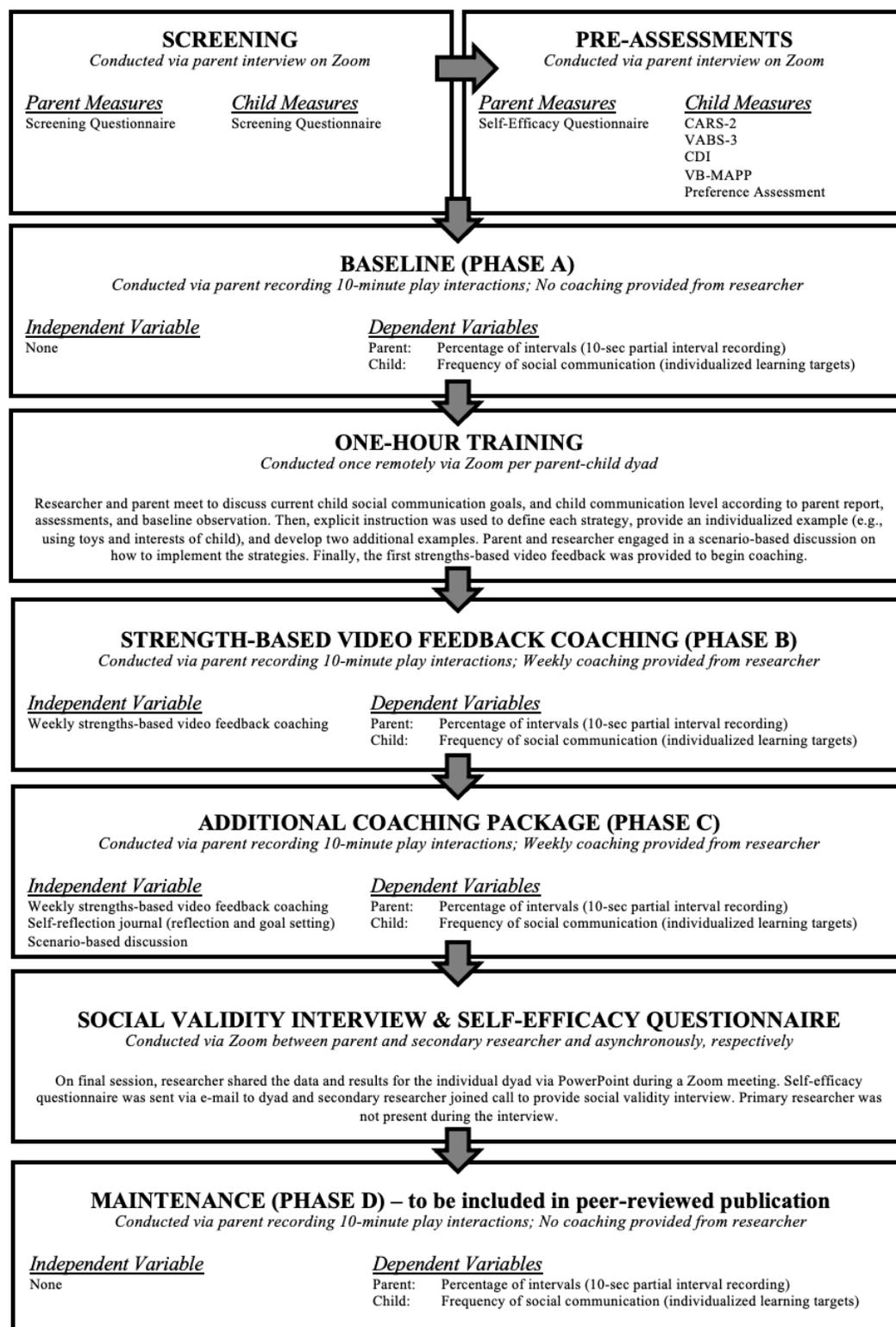
*Note.* Communication modes and learning targets were developed in collaboration with the parent after reviewing current speech goals from their speech services, parent input/preference, and assessment results; AAC = augmentative and alternative communication

**Procedures**

First, parents were screened for eligibility. Next, parents engaged in assessments. Then, the parents participated in three to four phases of the study. Finally, social validity and self-efficacy follow-up questionnaires were conducted. See Figure 1 for a visual representation of all phases in the study.

Figure 1

## Visual Representation of Study Procedures



### ***Screening and Assessment***

The researcher met with parents via Zoom or phone call to screen for eligibility using the screening script outlined in Appendix D. Then, the researcher reviewed the consent form with the parent through screensharing on Zoom. Once consent was provided (i.e., parents signed, dated, and returned the consent form) a follow-up meeting was scheduled via Zoom to discuss the child's current Individualized Family Support Plan (IFSP) or Individualized Education Plan (IEP) and current communication mode (e.g., vocal speech, AAC), and collaborate with parents to develop a short-term goal for their child for the study (e.g., say their first word). Finally, five assessments were conducted via interview over Zoom in the following order: (a) demographic questionnaire, (b) *VABS-3*, (c) *Childhood Autism Rating Scale – 2*, (d) *MacArthur-Bates Communicative Development Inventories*, (e) *Verbal Behavior Milestones and Assessment Placement Program*, and (f) indirect preference assessment. The parent also completed the *Autism-Specific Parent Self-Efficacy Scale – Revised* on their own and sent it back to the researcher via e-mail. See Table 4 for child assessment results.

**Childhood Autism Rating Scale – 2.** The Childhood Autism Rating Scale – 2 (CARS-2) is an assessment tool that categorizes the level of “abnormalities” a child displays. Fifteen areas are evaluated: relating to people; imitation; emotional response; body use; object use; adaptation to change; visual response; listening response; taste, smell, and touch response and use; fear or nervousness; verbal communication; nonverbal communication; activity level; level and consistency of intellectual response; and general impressions. A 7-point Likert rating scale is used, with the possibility for half scores (e.g., 3.5; 1 = *age appropriate*; 2 = *mildly abnormal*; 3 = *moderately abnormal*; 4 = *severely abnormal*). The CARS-2 demonstrates good internal consistency ( $\alpha = 0.94$ ), interrater reliability ( $\alpha = 0.71$ ), test-retest reliability (coefficient

kappa = 0.64), and high criterion related validity ( $r = 0.84$ ; Schopler et al., 2010). This assessment allowed the researcher to ensure the child displayed autistic characteristics and it allowed for a consistent rating of severity of ASD for each participant.

**Table 4***Child Assessment Results*

	CARS-2 (severity)	VABS-3				MCDI	Indirect Preference Assessment
		ABC Score	Communication Standard Score	Receptive AE	Expressive AE		
Jem	47.5 (severe)	68 ( <i>SD</i> = - 2)	64 ( <i>SD</i> = - 2)	1 year 6 months	1 year 8 months	5 words	Basketball Painting Small toys
DJ	46.5 (severe)	53 ( <i>SD</i> = - 3)	40 ( <i>SD</i> = - 3)	1 year 0 months	0 years 5 months	0 words	Trampoline Barrel Swing
Bailey	45.5 (severe)	67 ( <i>SD</i> = - 2)	51 ( <i>SD</i> = - 3)	0 years 11 months	1 year 2 months	0 words	Alphabet letters Ball pit Kinetic sand
Adrian	43.5 (severe)	69 ( <i>SD</i> = - 2)	64 ( <i>SD</i> = - 2)	1 year 5 months	0 years 5 months	0 words	Tablet Painting Links
Harry	49.0 (severe)	45 ( <i>SD</i> = - 3)	32 ( <i>SD</i> = - 3)	0 years 8 months	1 year 4 months	2 words	Trampoline Phone games Singing/Counting

*Note.* CARS-2 = Childhood Autism Rating Scale – 2<sup>nd</sup> Edition; VABS-3 = Vineland Adaptive Behavior Scale – 3<sup>rd</sup> Edition; MCDI =

MacArthur-Bates Communication Development Inventories; ABC = Adaptive Behavior Composite; AE = age equivalence; SD = standard deviation.

**Demographic Questionnaire.** As outlined in Appendix E, the demographic questionnaire was used to better understand the parent, child, and family. The final question regarded the child's current communication goals and communication mode. The researcher requested to continue the use of the current communication mode in addition to vocal speech with each dyad. All but one dyad agreed. Dyad 1 did not want to use the AAC system the school provided because the parent did not believe it was necessary.

**VABS-3.** The VABS-3 is a norm-referenced assessment for individuals ranging from birth through over 90 years of age. There are five domains evaluated: communication (receptive, expressive, and written); daily living skills (personal, domestic, numeric, community, school community); socialization (interpersonal relationships, play and leisure, coping skills); motor skills (gross motor, fine motor); and maladaptive behavior (internalizing, externalizing, critical items). Each of the five domains are given standard scores and age-level comparisons (e.g., 3 years 2 months). All domains except for maladaptive behavior can be combined to create a composite score for the child. The assessment is valid with excellent internal consistency (range 0.94 – 0.99) and test-retest reliability (range 0.64 – 0.94; Pepperdine & McCrimmon, 2018). For the purposes of this study, maladaptive behavior was not evaluated. The information from the VABS-3 was used to provide the researcher with a developmental understanding of the child's social communication, motor, and play skills. Further, the assessment assisted with identifying if the child qualified for the study (i.e., displays a delay in communication).

**MacArthur-Bates Communicative Development Inventories.** *MacArthur-Bates Communicative Development Inventories* (MCDI) is a parent-report assessment that evaluates the child's development of early language (e.g., vocabulary, gestures, production). The second form (MCDI-III) focuses on words the child can vocally produce. All parents were provided with

the MCDI-III form provided that the study was for children with minimal vocal speech. The assessment has excellent internal consistency ( $r_s = 0.95-0.96$ ), test-retest reliability ( $r_s = 0.80-0.90$ ), and concurrent validity ( $r = 0.72$ ; Bates et al., 1988). This assessment served as an additional evaluation to understand the child's vocal social communication skills.

**Verbal Behavior Milestones Assessment and Placement Program.** The *Verbal Behavior Milestones Assessment and Placement Program* (VB-MAPP) is a curriculum-based assessment that is commonly utilized to assist practitioners in choosing social communication targets for children with ASD and other developmental disabilities. It is developed for younger children, as it is targeted toward children performing at the developmental level of typical children aged birth to 48 months. There are 12 domains: mand; tact; echoic; intraverbal; listener; motor imitation; independent play; social and social play; visual-perceptual; matching-to-sample; linguistic structure; and group and classroom skills. For the purposes of this study, the mand, tact, echoic, intraverbal, and social behavior and social play domains were evaluated to understand the social communication skill level of the child.

**Indirect Preference Assessment.** Given the platform of the proposed project was via remote practice (i.e., not in person), an indirect preference assessment was conducted. Specifically, the parents were provided with a list of various toys and play routines and were asked to rank them based on how much their child enjoys that item or activity. At the end, the parent was given the opportunity to recommend other play activities that were not included in the assessment that the child likes (e.g., an alphabet rug). Three to five different types of toys and activities were selected and put into a list and shared with the parent. The list of activities were the only activities the parent and child engaged in for all phases of the study. See Appendix F for indirect preference assessment.

**Autism-Specific Parent Self-Efficacy Scale – Revised.** Kurzrok and colleagues developed a parent self-efficacy scale, geared toward parents of children with ASD. A 5-point Likert scale (1 = *strongly disagree*; 2 = *disagree*; 3 = *neutral*; 4 = *agree*; 5 = *strongly agree*) is used to evaluate various components such as understanding how to help their child and feeling that the parent can advocate for their child. This parent self-efficacy scale was revised for the purposes of this study to specifically discuss supporting their child's social communication skills. See Appendix G for self-efficacy questionnaire.

***Phase A: Baseline***

No training or coaching was provided to the parent before or during the baseline phase. At the beginning of each week, the researcher met with the parents via Zoom for five to ten minutes. During these meetings, the researcher followed the fidelity checklist outlined in Appendix H. Specifically, she: (a) greeted the parent; (b) stated if videos were received or not; (c) provided any necessary guidance on future recordings (e.g., muted volume); (d) asked parents to delete the videos off of the tablet, (e) requested parents to record one to three 10-minute videos for the next week, (f) asked parents if they had any questions, and (g) verified the next meeting date.

For probe sessions, parent's self-recorded 10-minute play sessions between themselves and their child one to three times weekly for 14 weeks using the researcher-provided tablet and tripod. During baseline probes, the parent (a) set up the tablet and tripod in a position that captured the play interaction between themselves and their child, (b) began a 10-minute timer, and (c) played with their child until the timer sounded. Then, the video was automatically uploaded to a secure online platform that was shared with the researcher (i.e., OneDrive, Zoom).

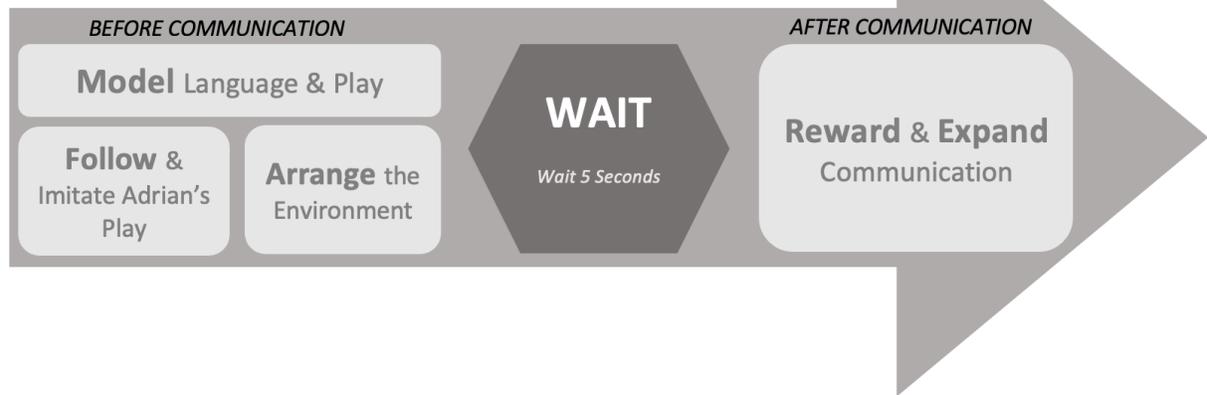
See Appendix I for the parent procedural checklist. The researcher viewed and coded the video upon receiving each 10-minute probe.

### ***Phase B: Strength-based Video Feedback Coaching***

**Parent Training.** The initial one-hour parent training occurred at the conclusion of baseline sessions following the aforementioned guidelines (e.g., parent data is deemed to be stable and not increasing). Each training occurred via telehealth and was individualized to represent individual child interests (i.e., specific toys; Raulston et al., 2019). Following parent training suggestions from Ingersoll and Dvortcsak (2019), the Division of Early Childhood (DEC, 2014), and Bruinsma et al. (2020), the training included: (a) collaborating with the parent to identify examples related to their child's interests, skills, and needs; (b) relating the strategies to the child's social communication learning target level; (c) demonstrating how the strategies could be incorporated into the family's naturally occurring routines; (d) documenting the examples discussed for future reference after the training; (e) engaging in a scenario-based discussion to practice strategies in a remote setting; (f) reflecting on each strategy and discussing any lingering questions or concern; and (g) providing written content before (i.e., strategies; See Figure 2) and after (i.e., examples discussed during the training for each of the strategies) the training. See Table 5 for an outline of the training. Finally, at the conclusion of the training, the parent was shown their first strength-based video feedback, and the researcher shared it with the parent. See Figure 3 below for a screenshot example of video feedback from the pilot study. See Appendix J for researcher fidelity checklist.

**Figure 2**

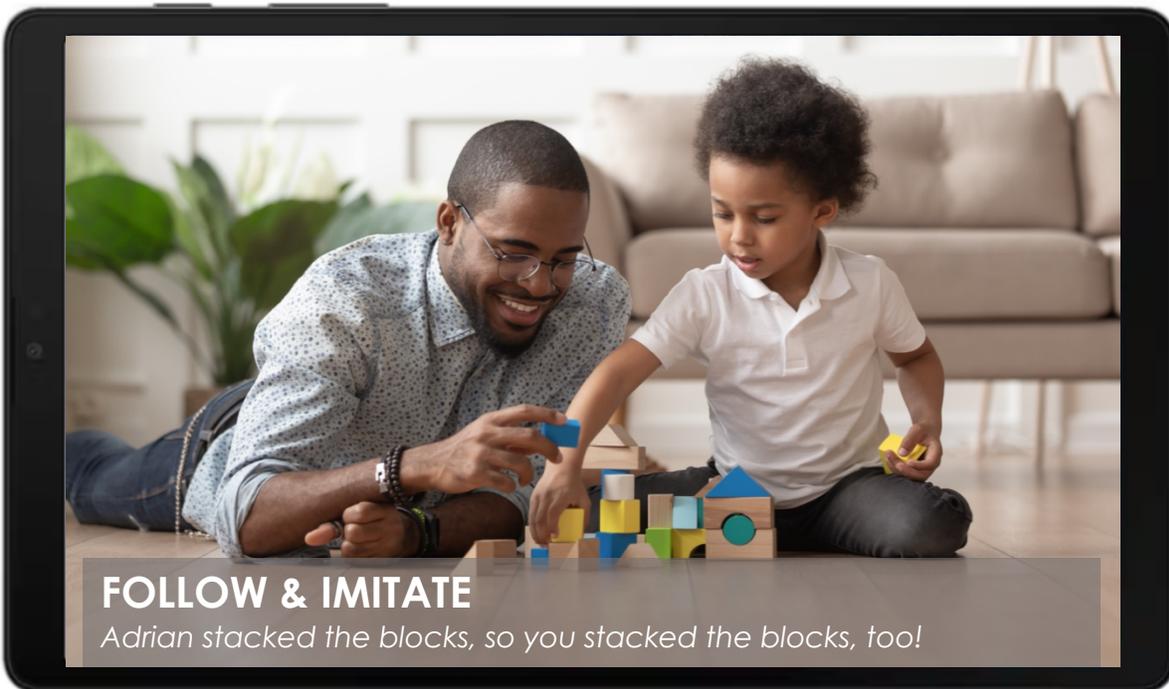
*Example Visual Representation of Five Strategies*



*Note.* The above photograph is a screenshot from the visual arrow for Dyad 4. Adrian is a pseudonym to protect the participants identity

**Figure 3**

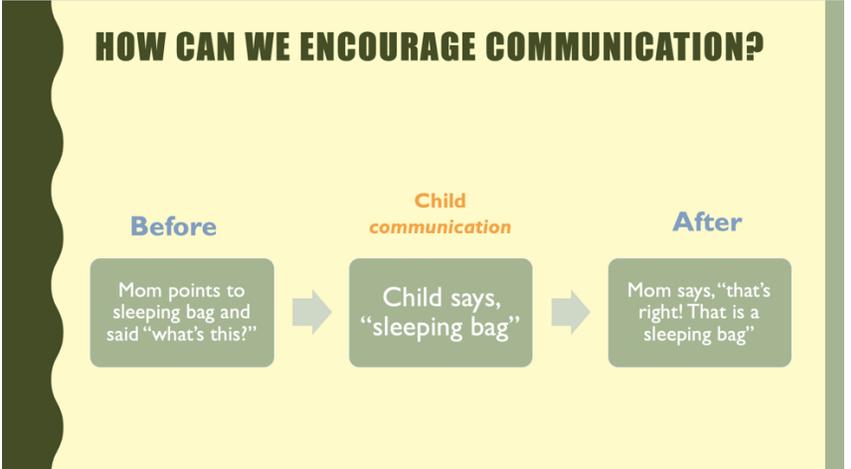
*Screenshot Example of Video Feedback Coaching*



*Note.* The above photograph was purchased through Adobe Stock Photos to maintain participant confidentiality. This serves as a screenshot example (i.e., still image of a video) of video feedback coaching with textual feedback.

**Table 5**

*Outline of Parent Training*

Component	Reasoning	Estimated Time	Example Slide from Pilot Investigation
Background of <i>why</i> social communication interventions are important	Encourages “buy-in” from the parent, noting the importance of the training.	2 minutes	 <p><b>INFLUENCING COMMUNICATION</b></p> <ul style="list-style-type: none"> <li>• Communication is social in nature           <ul style="list-style-type: none"> <li>– Driven by the <b>interactions</b> with others</li> </ul> </li> <li>• Play is important for language development           <ul style="list-style-type: none"> <li>– Motivating activity for the child</li> <li>– Linked to emotional development (feelings, etc.)</li> <li>– Influence future friendships</li> </ul> </li> </ul>
Demonstration of <i>how</i> the parent is already positively intervening with their child to encourage communication via video from baseline	Systematically breaks down interactions between the parent and the child. This positive example helps build confidence and empower the parent in believing they can intervene with their child.	5 minutes	 <p><b>HOW CAN WE ENCOURAGE COMMUNICATION?</b></p> <p><b>Before</b> → <b>Child communication</b> → <b>After</b></p> <p>Mom points to sleeping bag and said “what’s this?” → Child says, “sleeping bag” → Mom says, “that’s right! That is a sleeping bag”</p>

Collaboration between coach and parent to determine *what* the child's social communication goal should be

Explicitly encourages parents to share their valuable input and perspectives on what they would like to see with their child's social communication.

8 minutes



**CHILD'S GOAL**

Child does a wonderful job labeling the objects he sees while he is playing (e.g., "sleeping bag!").

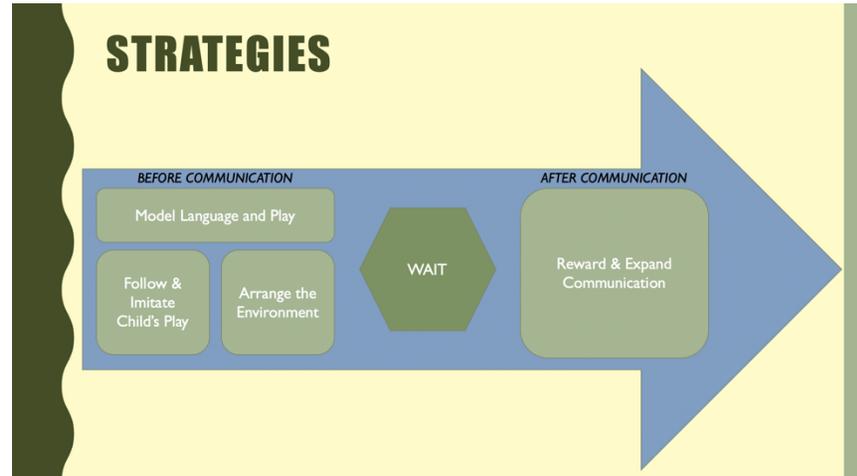
Let's add verbs and adjectives to his communication.

Refrigerator → refrigerator opens  
 Bristol → Bristol sits  
 Super wings → Super wings fly

Introduction of the *five strategies* that will be taught to the parent

Consistently introduces visual arrow, which is identical to the written content that was provided to the parent at the beginning of the training, is used to outline what strategies will be discussed.

5 minutes



Breakdown of each strategy using examples *on how the parent incorporated the strategy* from baseline videos, targeting routines already present in the child's environment

Empowers parent to believe that they can incorporate the strategies within their already-existing routines.

15 minutes

## FOLLOW & IMITATE CHILD'S PLAY

**Focus on what Child is playing with, and play with it, too!**

- Let Child decide on what to play with
  - Play with similar items in a similar way

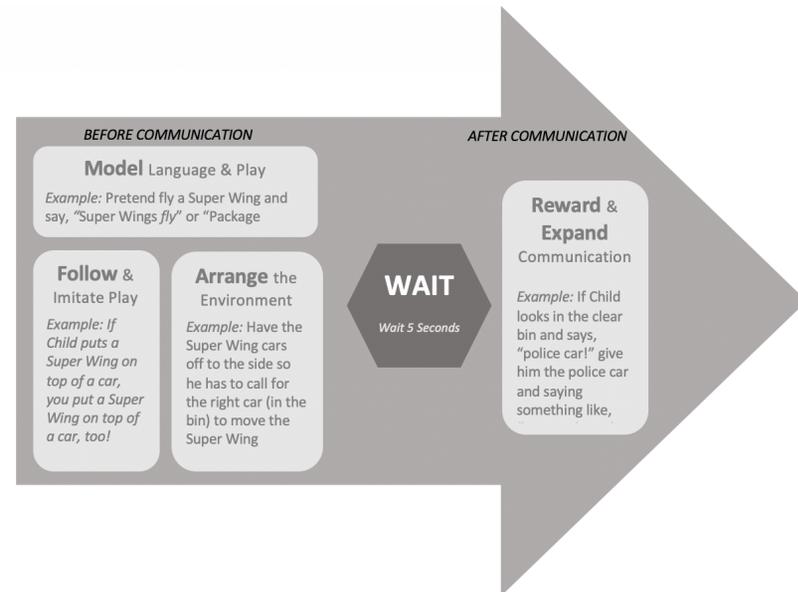
Child flies plane in the air

Mom imitates and flies plane in the air

Reflection and discussion of strategies and how they can be incorporated with *other routines* the parent and child have engaged in during baseline

Individualizes the instruction to be applicable to the parent and child's skills, environment, and activities. Parents are involved with developing the examples.

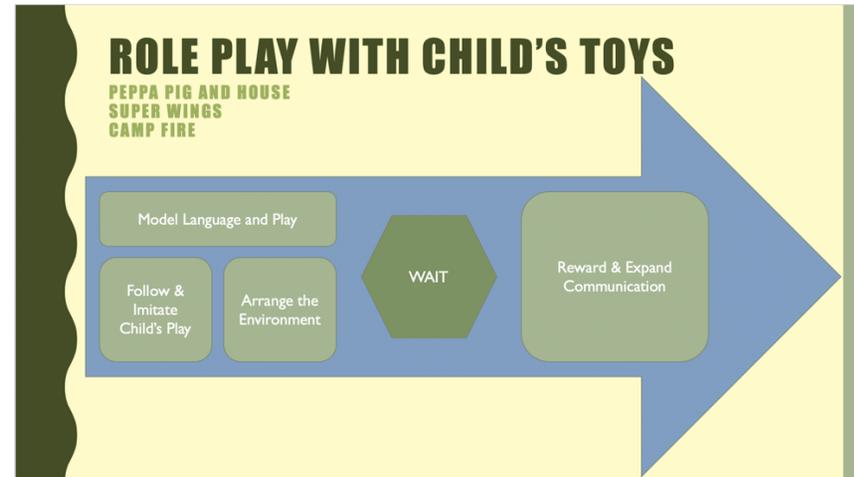
10 minutes



*Role play* between the parent and the coach with coach pretending to be the child and the parent playing the role of themselves, using least to most prompting on parent strategy use.

Provides individualized explicit practice with the coach present to give immediate guidance and feedback. Parents are empowered through strengths-focused feedback and prompts to utilize the strategies discussed between the coach and parent.

15 minutes



*Note.* Each component of the training was developed based upon parent training suggestions from Ingersoll and Dvortcsak (2019) and Bruinsma et al., 2020, as well as best practices from the Division of Early Childhood (DEC, 2014). Individuals within the photographs have granted permission to share for educational purposes. Any copying and/or use is strictly prohibited.

**Developing Video Feedback.** Prior to the researcher and parent weekly strength-based video feedback coaching session, the researcher developed video feedback. Video feedback was individualized for each parent (Raulston et al., 2019) and focused on three positive examples from the previous week to empower the parent. No constructive feedback was provided. To create the video feedback, the researcher uploaded short segments of the previous week's recordings onto *iMovie* (version 10.1.12) using her *MacBook* laptop. Then, she added textual feedback as an overlay on the video (e.g., "Model Language; You say, 'smoosh' while pushing the kinetic sand"). See Figure 3 for an example. Titles (e.g., "Example 1") and a visual highlighting what strategies were included in the clip preceded each shortened video clip. No voice over or additional coaching (e.g., highlighting missed opportunities) were included. Video feedback averaged 2 minutes and 28 seconds and ranged from 1 minute and 38 seconds to 3 minutes and 10 seconds in length, total.

**Strength-based Video Feedback Coaching Sessions.** The parent and the researcher met for approximately 30-minutes once per week for strength-based video feedback coaching. Each session began with a brief social interaction between the researcher and parent (Bruinsma et al., 2020). Next, the researcher asked how the video capturing and technical process went within the previous week. The researcher then highlighted one specific interaction, using praise to empower parents, build confidence, and follow best practice with parent coaching (Bruinsma et al., 2020; DEC, 2014). Then, the researcher asked the parent if they had any questions regarding the previous week or strategies. Finally, the researcher shared their screen and audio with the parent to display the strength-based video feedback. The researcher periodically provided praise, highlighting strong examples of how the parent-implemented the various strategies (e.g., "You did an *excellent* job imitating DJ by drumming along with him!"). At the conclusion of the

meeting, the researcher and parent verified the next meeting date, and the researcher encouraged the parent to (a) watch the video feedback immediately prior to playing with their child, and (b) continue incorporating the strategies with their child. See Appendix K for procedural fidelity checklist for strength-based video feedback coaching sessions.

***Parent Procedures.*** Similar to baseline, the parent set up the tablet and tripod in a position that captured the video and audio of the parent and child playing. However, the parent viewed the video feedback immediately before playing with their child. Next, the parent adjusted the video camera as needed and set a 10-minute timer. After playing with their child for 10-minutes, the parent ended the recording. The video was automatically uploaded to a shared online platform for the researcher to review. See Appendix L for the procedural fidelity checklist.

### ***Phase C: Additional Coaching Package***

An additional coaching package was provided for parents who did not meet criterion (i.e., the parent-implemented strategies in less than 65% of intervals for 4 out of the first 6 consecutive sessions). Additional coaching (i.e., self-reflection, goal setting, and scenario discussions) were incorporated into the weekly meetings. Self-reflection was chosen to encourage reflection on positive examples, capitalizing on Social Learning Theory (Bandura, 1986). Each session began with a brief social interaction between the researcher and parent (Bruinsma et al., 2020). Next, the researcher asked the parent to reflect upon the previous week and identify what went well and what was difficult for each session. See Appendix M for an example of the self-reflection journal page. Next, the researcher and parent collaborated to identify a goal for the upcoming week (e.g., following the child's lead). The researcher would discuss various ways that the parent could address the goal (e.g., if the child switches activities/toys, the parent could switch their

attention to the new activity/too, too). Then, the parent and the researcher engaged in a scenario-based discussion about to practice the goal. Finally, the researcher shared her screen to show the parent the new video feedback. Video feedback followed the same procedures as in Phase B. At the conclusion of the meeting, the researcher and parent verified the next meeting date. Then, the researcher encouraged the parent to (a) review the goal developed that day and (b) watch the video feedback immediately prior to playing with their child that upcoming week. After intervention concluded, the researcher met individually with the parents to show their corresponding data and graphs. See Appendix N for researcher fidelity checklist for additional coaching sessions.

**Parent Procedures.** Parents set up the tablet and tripod into a position that captured the parent reviewing the goal in the reflection journal. Similar to the video feedback phase, the parent continued to record themselves while they viewed the video feedback. Immediately after viewing video feedback, the parent adjusted the video camera as needed and set the 10-minute timer. Immediately after playing with their child for 10-minutes, the parent ended the recording. The parent was asked to complete the self-reflection journal immediately after the session. See Appendix O for a procedural fidelity checklist.

### ***Data Analysis***

Data were assessed through visual analysis and a standardized effect size. For visual analysis, the graph was assessed to evaluate increases in level and trend within each participant's data. In addition, variability, immediacy, and consistency of data were visually assessed for all phases of the study. Given that current recommendations for single-case design research include an effect size estimate for multiple-baseline designs to assess the magnitude of effects and nonoverlapping data, visual analysis was supplemented with standardized mean difference (i.e.,

scdhlms) and nonoverlap (i.e., Tau- $U$ ) effect sizes. Statistical analyses were run between baseline and the strength-based video feedback coaching phase (i.e., not the additional coaching phase). For the standardized mean difference effect size, the researcher used a web-based calculator at <https://jepusto.shinyapps.io/scdhlms> (Pustejovsky, 2021) which is appropriate for concurrent multiple-baseline single-case designs and is calculated using a hierarchical model. For the Tau- $U$  effect size calculation, the researcher used a web-based calculator with baseline trend correction at <https://jepusto.shinyapps.io/SCD-effect-sizes/> (Pustejovsky et al., 2021).

### ***Social Validity & Parent Self-Efficacy Assessments***

At the conclusion of intervention, all five parents were interviewed following the *Treatment and Acceptability Rating Form-Revised* (TARF-R). There were 25 questions regarding the intervention. Twenty-four were Likert-scale questions (Scale of 1 – 5) and one was an optional open-ended question. A second researcher who is not involved with the intervention conducted the interviews to avoid bias. Interviews occurred via Zoom and were recorded. Interviews ranged from 9 minutes and 35 seconds to 40 minutes and 29 seconds. See Appendix P for the questions.

In addition to measuring social validity, parents completed the same self-efficacy form that they completed at the beginning of the study (See Appendix G). Ratings range from one (i.e., strongly disagree) to five (strongly agree). Answers from pre- and post-intervention were compared using a paired samples  $t$  test to investigate the presence of a statistically significant change in parent's self-efficacy from the intervention by each parent and by each question.

### **Procedural Fidelity**

A second researcher, a doctoral candidate, served as the primary coder for the fidelity of the treatment for both parent and researcher behavior. She applied a checklist to evaluate the

fidelity of parent implementation on 100% of all probe sessions (See Appendix I, L, and O). Dyads 1, 2, 3, and 5 implemented all sessions with 100% fidelity. Dyad 4 implemented baseline sessions with 65% fidelity (range 33%–67%), strength-based video feedback phase with 56% fidelity (range 50%–75%), and all probes within the additional coaching phase with 40% fidelity. Additionally, the second researcher evaluated the fidelity of each training ( $n = 5$ ), following the task list in Appendix J, indicating that the lead investigator adhered to the training task analysis with 100% fidelity for all five dyads. Finally, at least 20% of randomly selected parent-researcher meetings for all phases and dyads were evaluated for researcher behavior (See Appendix I, K, and N, respectively). The researcher performed at 100% fidelity for all dyads.

### **Interobserver Agreement**

The lead investigator trained the second researcher to perform interobserver agreement (IOA). Time-stamped IOA were evaluated on at least 20% of data for both parent and child data (Kratochwill et al., 2014) for all phases and dyads by dividing the total number of agreements by the total number of agreements and disagreements. The number was then multiplied by 100 to create a percentage of agreement (Ledford et al., 2018). Agreement for parent behavior for Dyad 1 was 93% (no range) for baseline, 96% (range 93%–98%) for strength-based video feedback, and 95% (range 92%–98%) for the additional coaching phase. Agreement for child social communication for Dyad 1 was 100%, 92% (range 89%–95%), and 96% (range 94%–98%) for baseline, strength-based video feedback, and additional coaching phases, respectively. For Dyad 2, IOA was 97% (range 95%–98%) for baseline, 94% (range 93%–95%) for the strength-based video feedback phase, and 92% (no range) for the additional coaching phase. Agreement for child social communication for Dyad 2 was 100% (no range) for baseline, 95% for strength-based video feedback phase (range 89%–100%), and 100% (no range) for the additional

coaching phase. Agreement for parent behavior for Dyad 3 was 95% (no range) for baseline and 94% (range 90%–98%) for the strength-based video feedback phase. Agreement for child social communication for Dyad 3 was 100% (no range) for baseline and 96% (range 91%–100%) for the strength-based video feedback phase. For Dyad 4, IOA was 97% (range 93%–100%) for baseline, 95% (no range) for the strength-based video feedback phase, and 93% (range 93%–95%) for the additional coaching phase. Agreement for child social communication for Dyad 4 was 100% (no range) for baseline, 100% (no range) for strength-based video feedback, and 95% (range 90%–100%) for the additional coaching phase. Agreement for parent behavior for Dyad 5 was 95% (range 90%–98%) for baseline and 96% (range 95%–97%) for the strength-based video feedback phase. Agreement for child social communication for Dyad 5 was 94% (range 91%–100%) for baseline and 98% (range 96%–100%) for the strength-based video feedback phase.

## CHAPTER 3

### RESULTS

The current research study evaluated the effects of a one-hour training followed by weekly strength-based video feedback delivered via telepractice on parent strategy use and child social communication. Seven empirical research questions were evaluated in the current study via a (a) concurrent multiple-baseline single-case design employed across five parent-child dyads, (b) social validity questionnaire, and (c) self-efficacy assessments.

Upon visual analysis of the graph, there were four basic effects from baseline to intervention (i.e., Dyad 1, Dyad 2, Dyad 3, and Dyad 4), demonstrating a functional relation between strength-based video feedback coaching and parent strategy use. The between cases standardized effect size for parent strategy use was 2.294,  $SE = 0.475$ , 95% CI [1.286, 3.303]. Given that the scdhlms effect size is analogous to a Cohen's  $d$  by correct for small sample sizes, this indicated a large (above 0.8) effect size (Cohen, 1988). Tau- $U$  nonoverlap calculations were 1.00, 1.00, 1.00, 1.00, and 0.29 for each baseline to strength-based video feedback coaching phase comparison across all parents' strategy use, respectively. See Table 6 for Tau- $U$  calculations. Visual inspection of graphed child revealed two demonstrations of effects (i.e., Dyad 1 and Dyad 2). Therefore, no functional relation between baseline and strength-based video feedback coaching was present. The standardized mean difference calculation for child social communication suggests a small effect (below 0.5; Cohen, 1988) with an effect size of 0.440,  $SE = 0.170$ , 95% CI [0.070, 0.810]. Nonoverlap comparison of baseline to the strength-based video feedback coaching phase calculations (i.e., Tau- $U$ ) for child behavior were 1.00, 0.85, 0.84, 0.88, and - 0.24 respectively. Three of the five parents did not meet criterion within the strength-based video feedback phase and received an additional coaching package. There are

no demonstrations of basic effect from strength-based video feedback coaching to the additional coaching package for parent strategy use. Tau-*U* calculations comparing the strength-based video feedback coaching to the additional coaching phase were See Figure 4 for a graphical representation of percentage of intervals with parent strategy use and total frequency of child social communication learning targets. See Tables 7 and 8 for a tabular depiction of the means and ranges for each individual strategy and total strategy use for all five parents and social communication for each child, respectively.

**Table 6**

*Tau-U Calculations: Baseline to Strength-based Video Feedback Comparison*

	Tau- <i>U</i> (size)	Standard Error	95% Confidence Interval	
			Lower	Upper
Dyad 1				
Atticus	1.00 (very large)	0.06	1.00	1.00
Jem	1.00 (very large)	0.06	1.00	1.00
Dyad 2				
Danny	1.00 (very large)	0.03	1.00	1.00
DJ	0.85 (very large)	0.15	0.27	0.97
Dyad 3				
Meredith	1.00 (very large)	0.02	1.00	1.00
Bailey	0.84 (very large)	0.11	0.35	0.97
Dyad 4				
Daetreon	1.00 (very large)	0.03	1.00	1.00
Adrian	0.88 (very large)	0.10	0.25	0.98
Dyad 5				
Diana	0.29 (moderate)	0.25	-0.26	0.68
Harry	- 0.24 (small negative)	0.30	-0.65	0.30

*Note.* Tau-*U* calculations accounted for baseline corrections and measured nonoverlap from baseline to the strength-based video feedback coaching phase; effect size estimates are according to Vannest & Ninci (2015)

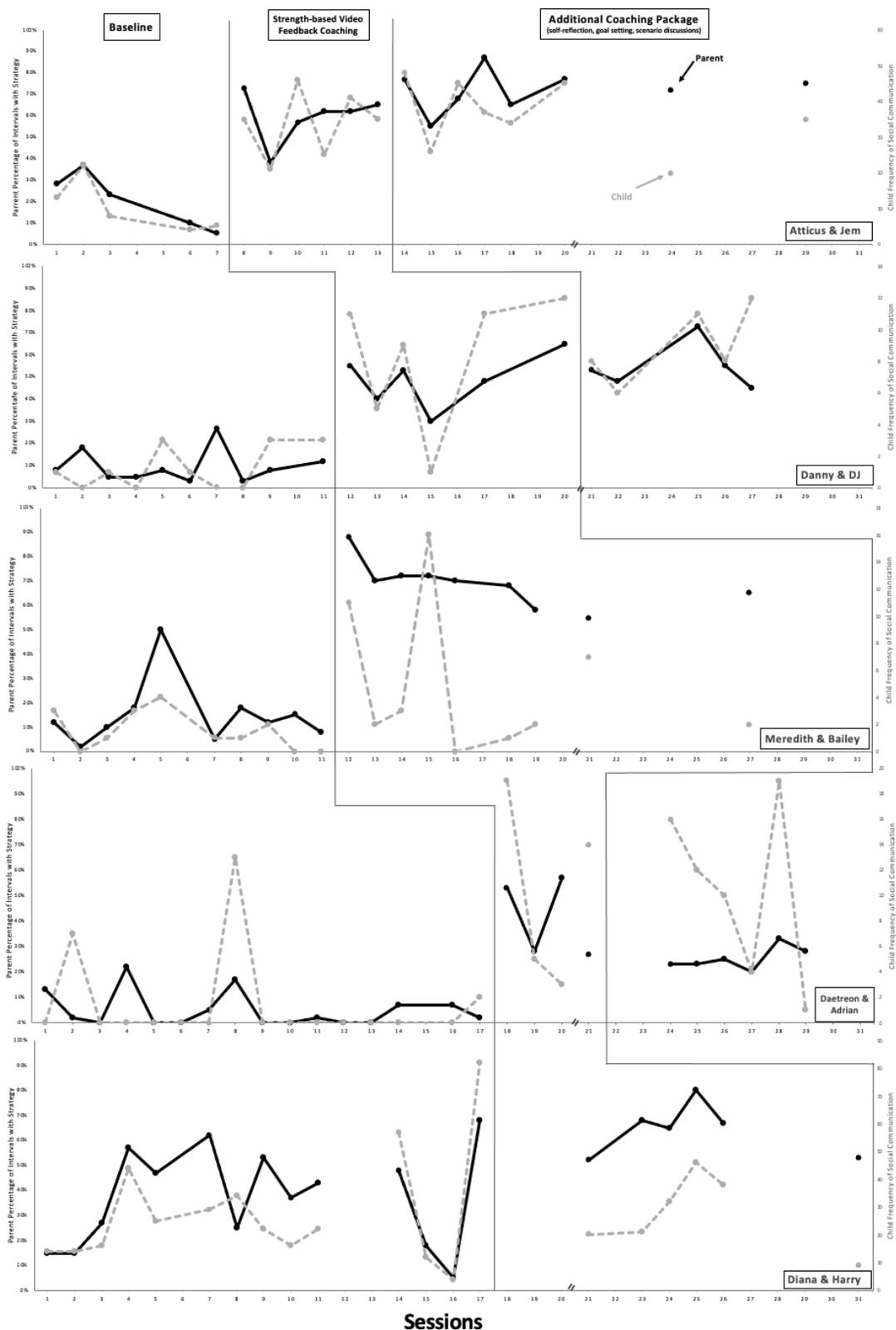
**Table 7***Tau-U Calculations: Strength-based Video Feedback Coaching to Additional Coaching Comparison*

	Tau-U (size)	Standard Error	95% Confidence Interval	
			Lower	Upper
Dyad 1				
Atticus	0.65 (large)	0.23	0.03	0.90
Jem	0.12 (small)	0.32	-0.43	0.61
Dyad 2				
Danny	0.23 (moderate)	0.36	-0.41	0.71
DJ	0.03 (small)	0.39	-0.55	0.59
Dyad 4				
Daetreon	-0.71 (large negative)	0.23	-0.94	0.06
Adrian	-0.04 (small negative)	0.41	-0.62	0.57

*Note.* Tau-U calculations accounted for phase one corrections and measured nonoverlap from strength-based video feedback coaching to addition coaching phases; effect size estimates are according to Vannest & Ninci (2015)

**Figure 4**

*Percentage of Intervals with Parent Strategy Use and Frequency of Child Social Communication*



**Table 8***Means and Ranges of the Percentage of Intervals on Parent Strategy Use*

	Strategy					
	Follow & Imitate	Arrange Environment	Model Language	Wait Time	Reward & Expand	Total
<b>Atticus</b>						
Baseline						
<i>M</i>	1%	1%	10%	3%	8%	21%
(range)	(0%-5%)	(0%-5%)	(0%-17%)	(0%-8%)	(0%-20%)	(5%-37%)
Intervention 1						
<i>M</i>	20%	15%	23%	14%	27%	60%
(range)	(5%-32%)	(12%-18%)	(13%-32%)	(10%-17%)	(15%-38%)	(38%-73%)
Intervention 2						
<i>M</i>	28%	13%	39%	6%	31%	72%
(range)	(5%-48%)	(0%-27%)	(30%-45%)	(0%-23%)	(12%-50%)	(55%-87%)
<b>Danny</b>						
Baseline						
<i>M</i>	4%	2%	5%	1%	2%	10%
(range)	(0%-22%)	(0%-5%)	(0%-12%)	(0%-3%)	(0%-5%)	(3%-27%)
Intervention 1						
<i>M</i>	14%	16%	26%	16%	11%	49%
(range)	(8%-23%)	(5%-30%)	(17%-37%)	(5%-28%)	(2%-18%)	(30%-65%)
Intervention 2						
<i>M</i>	20%	14%	35%	7%	12%	55%
(range)	(12%-27%)	(10%-18%)	(30%-48%)	(2%-13%)	(8%-17%)	(45%-73%)

Meredith						
Baseline	3%	2%	9%	2%	2%	15%
<i>M</i>	(0%-7%)	(0%-8%)	(2%-45%)	(0%-12%)	(0%-5%)	(2%-50%)
(range)						
Intervention 1						
<i>M</i>	30%	6%	46%	7%	5%	69%
(range)	(7%-52%)	(2%-13%)	(30%-66%)	(2%-17%)	(0%-12%)	(55%-88%)
Daetreon						
Baseline						
<i>M</i>	3%	0%	1%	0%	1%	5%
(range)	(0%-20%)	(0%-2%)	(0%-7%)	NA	(0%-15%)	(0%-22%)
Intervention 1						
<i>M</i>	11%	9%	8%	12%	13%	41%
(range)	(0%-37%)	(0%-25%)	(3%-13%)	(0%-17%)	(7%-28%)	(27%-57%)
Intervention 2						
<i>M</i>	5%	3%	10%	0%	11%	25%
(range)	(0%-8%)	(0%-8%)	(2%-23%)	(0%-2%)	(0%-18%)	(20%-33%)
Diana						
Baseline						
<i>M</i>	3%	5%	15%	2%	23%	37%
(range)	(0%-15%)	(0%-25%)	(3%-48%)	(0%-8%)	(3%-57%)	(5%-68%)
Intervention 1						
<i>M</i>	16%	13%	29%	22%	23%	64%
(range)	(3%-37%)	(8%-18%)	(15%-48%)	(0%-38%)	(13%-37%)	(52%-80%)

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*Note.* NA = not applicable.

**Table 9***Means and Ranges of Frequency of Child Social Communication*

Child	Baseline	Intervention 1	Intervention 2
Jem	$M = 10$ Range (4–22)	$M = 34$ Range (21–46)	$M = 36$ Range (20–48)
DJ	$M = 1$ Range (0–3)	$M = 8$ Range (1–12)	$M = 9$ Range (6–12)
Bailey	$M = 2$ Range (0–4)	$M = 5$ Range (0–16)	NA
Adrian	$M = 1$ Range (0–13)	$M = 10$ Range (3–19)	$M = 10$ Range (1–19)
Harry	$M = 28$ Range (4–82)	$M = 28$ Range (9–46)	NA

*Note.* NA = not applicable

### **Parent Strategy Use and Child Social Communication**

#### ***Dyad 1: Atticus and Jem***

Prior to receiving training and strength-based video feedback, Atticus implemented the strategies for an average of 21% of intervals (range 5%–37%). Visual inspection of Atticus' strategy use illustrated low levels with no variability and a decreasing trend. The most commonly used strategy was Model Language ( $M = 10\%$ ; range 0%–17%), and the least commonly used strategies were Follow and Imitate and Arrange the Environment ( $M = 1\%$ ; range 0%–5% for

both). During baseline, Jem said an average of 10 words or phrases (range 4–22). Visual inspection of Jem’s baseline data indicates low levels with no variability and a decreasing trend.

Upon entering the first phase of intervention, Atticus’ implemented the strategies for an average of 60% of intervals (range 38%–73%). Visual analysis of Atticus’ strategy use indicates an immediate change in level with minimal variability (i.e., first data point) and a gradually increasing stable trend demonstrating a basic effect. Tau-*U* calculations suggest very large effects ( $ES = 1.00$ ,  $SE = 0.06$ , 95% CI [1.00, 1.00]) on parent strategy use. The strategy used most was Reward and Expand ( $M = 27%$ ; range 15%–38%) and least commonly used strategy was Wait Time ( $M = 14%$ ; range 10%–17%). In the first intervention, Jem said an average of 34 words or phrases (range 21–46). Visual interpretation of Jem’s social communication demonstrates an immediate change in level with zero trend and moderate levels of variability demonstrating a basic effect. Tau-*U* calculations suggest very large effects ( $ES = 1.00$ ,  $SE = 0.06$ , 95% CI [1.00, 1.00]) on child social communication.

In the additional coaching intervention phase, Atticus implemented strategies for an average of 72% of intervals (range 55%–87%). A visual inspection of Atticus’ strategy use reveals no change in level (i.e., no demonstration of effect) with a slightly increasing and variable trend. Tau-*U* calculations suggest large additive effect ( $ES = 0.65$ ,  $SE = 0.23$ , 95% CI [0.03, 0.90]) on parent strategy use when additional coaching was provided. The most incorporated strategy was Model Language ( $M = 39%$ ; range 30%–45%) and the least commonly used strategy was Wait Time ( $M = 6%$ ; range 0%–23%). Jem said an average of 36 words or phrases (range 26–48). Visual analysis of Jem’s social communication reveals moderate variability with a slightly increasing trend, followed by high variability and with no trend at the end of the phase. There was no change in level, therefore there is no demonstrate of a basic

effect. Tau-*U* calculations suggest small additive effects ( $ES = 0.12$ ,  $SE = 0.32$ , 95% CI [-0.43, 0.61]) on child social communication when additional coaching was provided to the parent.

### ***Dyad 2: Danny and DJ***

During baseline, Danny incorporated strategies within routines an average of 10% of intervals (range 3%–27%). Visual interpretation of the graph indicates low levels of parent strategy use with little variability. The strategy incorporated most often was Model Language ( $M = 5\%$ ; range 0%–12%). The strategy used the least was Wait Time ( $M = 1\%$ ; range 0%–3%). DJ averaged one word approximation or gesture (range 0–3). Visual inspection of DJ's data illustrates low levels of social communication with little variability prior to intervention.

In the first intervention phase, Danny used strategies for an average of 49% of intervals (range 30%–65%). Upon visual analysis of the graph, there was an immediate change in level, with moderate variability and an increasing trend demonstrating a basic effect. Tau-*U* calculations suggest very large effects ( $ES = 1.00$ ,  $SE = 0.03$ , 95% CI [1.00, 1.00]) on parent strategy use. The most incorporated strategy was Model Language ( $M = 26\%$ ; range 17%–37%) and the least commonly used strategy was Reward and Expand ( $M = 11\%$ ; range 2%–18%). DJ averaged eight word approximations or gestures (range 1–12). Visual inspection of DJ's data reveals an immediate change in level with large variability and a slightly increasing trend demonstrating a basic effect. Tau-*U* calculations suggest very large effects ( $ES = 0.85$ ,  $SE = 0.15$ , 95% CI [0.27, 0.97]) on child social communication.

Upon entering the second intervention phase, Danny incorporated strategies in an average of 55% of intervals (range 45%–73%). Visual analysis of indicates no change in level (i.e., no demonstration of a basic effect) with moderately variable data and no trend. Tau-*U* calculations suggest moderate additive effects ( $ES = 0.23$ ,  $SE = 0.36$ , 95% CI [-0.41, 0.71]) on parent

strategy use when additional coaching was provided. Model Language was the strategy incorporated most often ( $M = 35\%$ ; range 30%–48%). The least commonly used strategy was Wait Time, occurring an average of 7% of intervals (range 2%–13%). DJ averaged nine word approximations or gestures (range 6–12). Visual analysis of DJ's data illustrates a variable but increasing trend with no change in level (i.e., no demonstration of a basic effect). Tau- $U$  calculations suggest small additive effects ( $ES = 0.03$ ,  $SE = 0.39$ , 95% CI [-0.55, 0.59]) on child social communication when addition coaching was provided to the parent.

### ***Dyad 3: Meredith and Bailey***

Before training and strength-based video feedback, Meredith implemented the strategies for an average of 15% of intervals (range 2%–50%). A visual inspection of Meredith's baseline data indicates low to moderate levels of strategy use with little variability and no trend. Model Language ( $M = 9\%$ ; range 2%–45%) was the most incorporated strategy, and the least commonly used strategy was Reward and Expand ( $M = 2\%$ ; range 0%–5%). During baseline, Bailey said an average of 1 word approximation each session (range 0–3). Bailey's baseline data, upon visual analysis, demonstrate low levels of social communication with little variability and no trend.

Upon entering the first phase of intervention, Meredith implemented the strategies for an average of 69% of intervals (range 55%–88%). Visual analysis of Meredith's data indicates an immediate change in level (i.e., demonstration of a basic effect) with a slight decreasing trend and no variability. Tau- $U$  calculations suggest very large effects ( $ES = 1.00$ ,  $SE = 0.02$ , 95% CI [1.00, 1.00]) on parent strategy use. The strategy used most was Model Language ( $M = 46\%$ ; range 30%–66%) and least commonly used strategy was Reward and Expand ( $M = 5\%$ ; range 0%–12%). Bailey said an average of five word approximations (range 0–16). Visual inspection of Bailey's data indicates large variability, no trend, and no change in level (i.e., no

demonstration of a basic effect). Tau-*U* calculations suggest very large effects ( $ES = 0.84$ ,  $SE = 0.11$ , 95% CI [0.35, 0.97]) on child social communication.

#### ***Dyad 4: Daetreon and Adrian***

During baseline, Daetreon incorporated strategies within routines an average of 5% of intervals (range 0%–22%). Visual interpretation of the graph illustrates low levels of parent strategy use with little variability. The strategy incorporated most often was Follow and Imitate ( $M = 3\%$ ; range 0%–20%). The strategy used the least was Wait Time, which never occurred. Adrian averaged one communication attempt using his AAC system (range 0–13). Visual inspection of Adrian's data indicates low or moderate levels, with small variability and no trend.

In the first intervention phase, Daetreon used strategies for an average of 41% of intervals (range 27%–57%). Upon visual analysis of the graph, there was an immediate change in level, demonstrating a basic effect with moderate variability and no trend. Tau-*U* calculations suggest very large effects ( $ES = 1.00$ ,  $SE = 0.03$ , 95% CI [1.00, 1.00]) on parent strategy use. The most incorporated strategy was Reward and Expand ( $M = 13\%$ ; range 7%–28%) and the least commonly used strategy was Model Language ( $M = 8\%$ ; range 3%–13%). Adrian averaged ten communication attempts using his AAC system (range 3–19). Visual inspection of Adrian's data illustrates no clear change in level (i.e., no demonstration of effect) with large variability and no clear trend. Tau-*U* calculations suggest very large effects ( $ES = 0.88$ ,  $SE = 0.10$ , 95% CI [0.25, 0.98]) on child social communication.

Upon entering the second intervention phase, Daetreon incorporated strategies in an average of 25% of intervals (range 20%–23%). Visual analysis of the graph indicates no clear demonstration of effect with moderate levels of parent strategy use, small variability, and no trend. Tau-*U* calculations suggest large negative additive effects ( $ES = -0.71$ ,  $SE = 0.23$ , 95%

CI [-0.94, 0.06]) on parent strategy use when an additional coaching package was introduced. Reward and Expand was the strategy incorporated most often ( $M = 11\%$ ; range 0%–18%). The least commonly used strategy was Wait Time, occurring an average of 0% of intervals (range 0%–8%). Adrian communicated an average of ten times using his AAC system (range 1–19). Visual interpretation of Adrian's data illustrates low to high levels of social communication with no change in level (i.e., no demonstration of effect) and large variability. Tau- $U$  calculations suggest small negative additive effects ( $ES = -0.04$ ,  $SE = 0.41$ , 95% CI [-0.62, 0.57]) on child social communication when an additional coaching package was introduced.

#### ***Dyad 5: Diana and Harry***

Prior to receiving training and strength-based video feedback, Diana implemented the strategies for an average of 37% of intervals (range 5%–68%). Visual inspection of Diana's baseline data indicates moderate to high levels of parent strategy use with a high degree of variability and no trend. The most commonly used strategy was Reward and Expand ( $M = 23\%$ ; range 3%–57%), and the least commonly used strategy was Wait Time ( $M = 2\%$ ; range 0%–8%). During baseline, Harry said an average of 28 words or phrases (range 4–82). There was a similar trend in Harry's baseline data upon visual analysis, with moderate to high levels of child social communication, with high levels of variability and no trend.

Upon entering the first phase of intervention, Diana implemented the strategies for an average of 64% of intervals (range 52%–80%). Visual analysis of her data indicates no demonstration of a basic effect with high levels of strategy use with a increasing trend. Tau- $U$  calculations suggest moderate effects ( $ES = 0.29$ ,  $SE = 0.25$ , 95% CI [-0.26, 0.68]) on parent strategy use. The strategy used most was Model Language ( $M = 29\%$ ; range 15%–48%) and least commonly used strategy was Arrange Environment ( $M = 13\%$ ; range 8%–18%). Harry said an

average of 28 words or phrases (range 9–46). Visual inspection of his data illustrates no demonstration of effect with low to moderate levels of social communication and a slightly increasing trend. Tau-*U* calculations suggest small effects ( $ES = -0.24$ ,  $SE = 0.30$ , 95% CI [-0.65, 0.30]) on child social communication.

### Social Validity

All five parents completed the social validity interviews to evaluate how parents perceived the intervention. All parents provided the highest rating for the acceptability of the intervention and the likelihood of continuing the use of the strategies within their home routines. Further, all parents provided the highest rating for how much they enjoyed being able to record the play sessions asynchronously, and all parents stated that there were no undesirable side effects or discomfort felt by the child during the intervention. Other perceptions varied from parent to parent. See Table 10 for an overview of the averages and ranges for each of the questions asked.

**Table 10**

*Social Validity Questions and Averages*

Question	Mean (range)
1. How acceptable did you find the intervention?	5 (NA)
2. How willing were you to carry out the strategies?	4.8 (4–5)
3. To what extent do you think there might have been disadvantages by following the intervention?	1.4 (1–2)*
4. How confident are you that the intervention was effective for your child?	4.4 (4–5)
5. How likely is this intervention to make permanent improvements in your	4.4 (4–5)

child's communication?	
6. How disruptive was it to carry out this intervention?	1.6 (1–2)*
7. How willing were other family members to help carry out the intervention? (if applicable)	4.6 (4–5)**
8. To what extent did you notice undesirable side-effects?	1 (NA)*
9. How much discomfort did you child experience?	1 (NA)*
10. How willing would you be to change your routines to continue this intervention?	4.8 (4–5)
11. How well will carrying out this intervention fit into your existing play time routines?	4.8 (4–5)
12. How well did the goal of the intervention fit within your goals for your child?	4.8 (4–5)
13. How effective was the intervention in teaching you how to communicate with your child?	4.6 (4–5)
14. What is the likelihood that you will continue using the strategies?	5 (NA)
15. Rate your feelings about each specific component of the intervention:	
1-hour training	4.6 (4–5)
Visual arrow with examples	4.2 (1–5)
Video feedback	4.8 (4–5)
Self-reflection journal	4.3 (4–5)**
Capturing and uploading videos on your own time/schedule	5 (NA)
16. Rate your feelings about each specific strategy:	
Model Language and Play	5 (NA)

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Follow and Imitate Child	4.8 (4–5)
Arrange Environment	4.2 (2–5)
Wait Time	4.6 (3–5)
Reward and Expand Child Communication	4.8 (4–5)

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*Note.* \* indicates and inverted question; \*\* indicates that the question was not applicable to all participants; NA = not applicable.

### *Atticus*

Atticus provided the highest rating (i.e., five out of five) for (a) acceptability of the intervention, (b) willingness to carry out the strategies, (c) willingness to change routines at home to continue use of the intervention, (d) ease in which the intervention fit into existing play time routines, (e) alignment of the intervention with his child’s goals, and (f) likelihood of continuing the intervention. In addition, Atticus shared that no negative side effects or discomfort were likely during the intervention (i.e., one out of five; inverted score). Atticus rated the visual arrow, video feedback, and ability to capture videos asynchronously with the highest rating. Finally, the strategies that received the highest rating from Atticus included Model Language, Follow and Imitate, Arrange Environment, and Wait Time.

The second highest rating (i.e., four out of five) was provided by Atticus for (a) confidence that the intervention was effective, (b) likelihood that the intervention made permanent changes in his child’s communication abilities, and (c) effectiveness of the intervention teaching him how to communicate with his child. Atticus rated the one-hour training, self-reflection journal, and the Reward and Expand strategy a four out of five. Finally, Atticus rated a two out of five on two inverted scoring questions: (a) extent that there were

disadvantages to the intervention, and (b) how disruptive the intervention was to carry out.

Atticus did not provide any additional feedback.

### ***Danny***

Danny provided the highest rating (i.e., five out of five) for (a) acceptability of the intervention; (b) willingness to carry out the strategies; (c) willingness of other family members (i.e., DJ's mother and grandmother) to carry out the intervention; (d) ease in which the intervention fit into existing play time routines, (e) likelihood of continuing the intervention. In addition, Danny shared that no disadvantages, negative side effects, or discomfort were likely during the intervention (i.e., one out of five; inverted score). Danny rated the one hour training, visual arrow, video feedback, and ability to capture videos asynchronously with the highest rating. Finally, the strategies that received the highest rating from Danny included Model Language, Wait Time, and Reward and Expand.

The second highest rating (i.e., four out of five) was provided by Danny for (a) confidence that the intervention was effective, (b) likelihood that the intervention made permanent changes in his child's communication abilities, and (c) willingness to change routines at home to continue the intervention, (d) how well the intervention aligned with his child's goals, and (e) effectiveness of the intervention teaching him how to communicate with his child. Danny rated the self-reflection journal, as well as the Follow and Imitate and Arrange Environment strategies a four out of five. Finally, Danny rated a two out of five on the inverted scoring question regarding how disruptive it was to carry out the intervention. Danny did not provide any additional feedback.

### ***Meredith***

Meredith provided the highest rating (i.e., five out of five) for (a) acceptability of the intervention, (b) willingness to change routines at home to continue use of the intervention, (c) alignment of the intervention with his child's goals (d) effectiveness of the intervention in teaching her how to communicate with her son, (e) and likelihood of continuing the intervention. In addition, Meredith shared that no disadvantages, undesirable side effects, or discomfort were likely during the intervention (i.e., one out of five; inverted score). Meredith rated the ability to capture videos asynchronously with the highest rating. Finally, the strategies that received the highest rating from Meredith included Model Language, Follow and Imitate, and Reward and Expand.

The second highest rating (i.e., four out of five) was provided by Meredith for (a) willingness to carry out the intervention strategies, (b) confidence that the intervention was effective, (c) likelihood that the intervention made permanent changes in her child's communication abilities, and (d) how well the intervention fit within existing playtime routines. Meredith rated the one-hour training and video feedback a four out of five. Meredith did not answer if other family members were willing to incorporate the intervention within their interactions with the child nor did she answer about the self-reflection journal as she did not enter into the additional coaching phase.

Finally, Meredith rated a two out of five on the inverted scoring question regarding how disruptive the intervention was to carry out. She rated the visual arrow a one out of five (i.e., did not like at all), Arrange the Environment strategy a two out of five (i.e., between "did not like at all" and "neutral"), and Wait Time a three out of five (i.e., neutral). Meredith did not provide any additional feedback.

***Daetreon***

Daetreon provided the highest rating (i.e., five out of five) for all (a) non-inverted questions, (b) study components, and (c) strategies. He shared that his wife had also began incorporating the strategies in playtime interactions with Adrian. Daetreon provided the lowest rating (i.e., one out of five) on all inverted questions. Daetreon did not include any additional feedback.

***Diana***

Diana provided the highest rating (i.e., five out of five) for (a) acceptability of the intervention, (b) willingness to carry out the strategies, (c) confidence that the intervention was effective, (d) likelihood of the intervention making permanent improvements with her child's communication abilities, (e) willingness to change routines at home to continue use of the intervention, (f) ease in which the intervention fit into existing play time routines, (g) alignment of the intervention with her child's goals, (h) effectiveness of teaching her how to communicate with her child, and (i) likelihood of continuing the intervention. In addition, Diana shared that the intervention was not disruptive, and it was unlikely that there were undesirable side effects or discomfort felt during the intervention (i.e., one out of five; inverted score). Diana provided the highest rating for all components (i.e., one hour training, visual arrow, video feedback, and ability to capture videos asynchronously) and strategies (i.e., Model Language, Follow and Imitate, Arrange Environment, Wait Time, and Reward and Expand) within the intervention.

The second highest rating (i.e., four out of five) was provided by Diana for the willingness of other family members carrying out the intervention. Diana shared that her husband had incorporated the strategies during his interactions with their child. Diana rated a two out of

five on the inverted scoring question regarding any disadvantages that may have occurred by following the intervention. In addition to the Likert-Scale questions, the parents were asked if there was anything else they would like to share. Diana shared:

*“I felt like I became more confident and comfortable when playing with my son... Throughout his life it’s been difficult to feel like I’m playing with him at times. This made me feel more like I’m playing with him in a way that he enjoys.”*

### **Parent Self-Efficacy**

All five parents completed the self-efficacy assessment prior to beginning baseline and four parents completed the assessment at the conclusion of intervention. Diana completed the pre-assessment but did not complete the post-assessment. See Table 10 for pre- and post-answers for each participant. An exploratory paired *t*-test determined there was not a statistical significance between pre and post intervention measures for any dyad. Similarly, paired *t*-test scores determined there was not a statistically significant change between pre- and post- answers when evaluated by question. At the conclusion of the self-efficacy assessment, parents were provided with an optional open-ended question: *Tell us about one memorable experience you have had while interacting with your child during this intervention that has influenced your confidence in your own parenting skills.* Three of the five parents responded (i.e., Daetreon did not answer the optional question). See Tables 11 and 12 for results of the paired *t* tests, respectively.

### ***Open-ended Question***

Three of the four participants who completed the post-self-efficacy assessment answered the optional open-ended question regarding a memorable experience they had during the intervention. Quotes from each are outlined below:

*“After seeing the data and actually being able to see in charts the progress we made was crucial in believing my interventions are working despite maybe not always being it in the moment.” – Atticus (Dyad 1)*

*“Hearing him repeat ‘blue’ and ‘green’ when we were doing the obstacle course. I didn’t even hear it while it was happening but I’ve since tried to listen more closely and heard him do it one other time.” - Danny (Dyad 2)*

*“The first two times I tried out the intervention techniques I was stunned at the utter joy and delight on my child’s face when I simply imitated him and followed him around. I was missing this puzzle piece before. And I’m so grateful that I’ve been able to utilize this simple technique to connect with him.” - Meredith (Dyad 3)*

**Table 11***Results of Pre and Post Self-Efficacy Assessments by Parent and Question*

Question	Atticus		Danny		Meredith		Daetreon		Diana	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1. I feel confident that I understand the elements of an ASD diagnosis and how that diagnosis relates to my child's social communication.	2	4	5	5	5	5	2	3	5	NR
2. I feel I am able to actively participate in my child's social communication therapy program.	4	4	5	5	4	5	5	4	5	NR
3. I feel confident that I can seek additional resources on social communication beyond what is provided to me.	3	3	4	4	4	4	3	2	5	NR
4. I feel confident that I understand the social communication goals and process of my child's intervention.	1	4	2	4	5	3	3	4	5	NR
5. I feel confident that I can incorporate aspects of my child's social communication interventions at home.	4	4	4	4	4	5	4	4	5	NR
6. I am confident that I can put things into a realistic perspective as I raise my child with ASD.	4	4	4	4	4	4	2	5	5	NR
7. I feel confident that I can accept both my child's social communication strengths and weaknesses as they pertain to their ASD diagnosis.	5	4	4	4	4	5	2	2	5	NR

8. I am confident that I can advocate for my priorities when speaking with professionals.	5	5	5	5	4	5	5	5	5	NR
9. I am confident that I can make realistic assessments of what will benefit my child most.	2	4	4	4	3	5	4	5	5	NR
10. I feel confident that I can navigate communication with my child's intervention team.	2	5	5	5	5	5	5	5	5	NR
11. I feel confident that I can handle difficult moments with my child when it comes to social communication.	3	4	5	5	3	4	4	5	5	NR
12. I feel confident that I have skills or qualities necessary to connect with my child with ASD.	4	4	5	5	4	5	2	3	5	NR

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*Note.* Diana did not complete the post-assessment; NR = not reported.

**Table 11***Results of Paired-Sample t Test for Pre and Post Self-Efficacy Assessments by Parent*

Parent	Mean difference	Standard error	95% confidence interval		<i>t</i>	<i>df</i>	Sig. (2-tailed)
			Lower	Upper			
Dyad 1: Atticus	-0.833	0.386	-1.683	0.16	-2.159	11	0.54
Dyad 2: Danny	-0.167	0.167	-0.533	0.200	-1.000	11	0.339
Dyad 3: Meredith	-0.500	0.289	-1.135	0.135	-1.732	11	0.111
Dyad 4: Daetreon	-0.500	0.314	-1.191	0.191	-1.593	11	0.139
Dyad 5: Diana	NA	NA	NA	NA	NA	NA	NA

*Note.* Diana did not complete the post-assessment; NA = not applicable.

**Table 12**

*Results of Paired-Sample t Test for Pre and Post Self-Efficacy Assessments by Question*

Question	Mean difference	Standard error	95% confidence interval		<i>t</i>	Sig. (2-tailed)
			Lower	Upper		
1. I feel confident that I understand the elements of an ASD diagnosis and how that diagnosis relates to my child's social communication.	- 0.750	0.479	-2.273	0.773	-1.567	0.215
2. I feel I am able to actively participate in my child's social communication therapy program.	0.000	0.408	-1.230	1.230	0.000	1.000
3. I feel confident that I can seek additional resources on social communication beyond what is provided to me.	0.250	0.250	-0.546	1.046	1.000	0.391
4. I feel confident that I understand the social communication goals and process of my child's intervention.	- 1.000	1.080	-4.44	2.437	-0.926	0.423
5. I feel confident that I can incorporate aspects of my child's social communication interventions at home.	- 0.250	0.250	- 1.05	0.546	-1.000	0.391
6. I am confident that I can put things into a realistic perspective as I raise my child with ASD.	- 0.750	0.750	- 3.137	1.637	-1.000	0.391
7. I feel confident that I can accept both my child's social communication strengths and weaknesses as they pertain to their ASD diagnosis.	0.000	0.408	-1.230	1.230	0.000	1.000

8. I am confident that I can advocate for my priorities when speaking with professionals.	- 0.250	0.250	-1.046	0.546	-1.000	0.391
9. I am confident that I can make realistic assessments of what will benefit my child most.	- 1.250	0.479	- 2.773	0.273	-2.611	0.080
10. I feel confident that I can navigate communication with my child's intervention team.	- 0.750	0.750	-3.137	1.637	-1.000	0.391
11. I feel confident that I can handle difficult moments with my child when it comes to social communication.	- 0.750	0.250	-1.546	0.046	-3.000	0.058
12. I feel confident that I have skills or qualities necessary to connect with my child with ASD.	- 0.500	0.289	-1.419	0.419	-1.732	0.182

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*Note.* Diana did not complete the post-assessment;  $df = 3$ .

## CHAPTER 4

### DISCUSSION

Parent-implemented NDBIs are an early intervention practice that can lead to increases in parent strategy use and child social communication (Akemoglu et al., 2020; Fuller & Kaiser, 2020). When empowerment is integrated within parent trainings and coaching sessions, parent fidelity and implementation of interventions may increase (Bandura, 1986; Dillenburger et al., 2002; Hsiao et al., 2018; Jones & Prinz, 2005; Kurzok et al., 2021; Sofronof & Farbotko, 2002). In the current study, I evaluated the effects of strength-based video feedback coaching (Stern, 1971), which capitalizes on the use of self-efficacy and Bandura's Social Learning Theory (Bandura, 1986), on (a) parent strategy use and (b) child social communication. The results of the present study provide evidence that strength-based video feedback coaching can be an effective tool to use for parent-implemented NDBIs. These findings add to the growing body of literature on NDBIs, telepractice-based parent-implemented interventions, and parent coaching practices. In this chapter, the results are summarized, implications are considered, and limitations and future research directions are discussed.

#### **Effects of Intervention on Parent Strategy Use**

A functional relation and large effects were determined to exist between a one-hour training followed by strength-based video feedback coaching and parent strategy usage for all five parents, as there were four demonstrations of basic effects at different points in time. Four of the five parents (i.e., Atticus, Danny, Meredith, and Daetreon) displayed relatively low levels of strategy use in baseline. One parent (i.e., Diana) demonstrated moderate to high levels of strategy use and a high degree of variability throughout baseline, ranging from 5% to 68% of intervals. Diana and Harry's baseline sessions contained several quiz questions (e.g., "Harry, what color is

this?). The variability and high levels of parent strategy use may have been due to Diana's occupation as a behavior therapist and/or her educational background on applied behavior analytic practices.

Four demonstrations of basic effects from baseline to the strength-based video feedback coaching were present, indicating a functional relation between the intervention and parent strategy use. Most parent data indicated variability (i.e., Atticus, Danny, Daetreon, Diana) in the strength-based video feedback coaching phase, and one parent's strategy use leveled out (i.e., Meredith). Variability within data was anticipated given that parents were encouraged to use a variety of toy and play activities as outline in the preference assessment. In the first intervention phase (i.e., strength-based video feedback coaching), two parents (i.e., Meredith and Diana), met criteria for strategy use and did not enter the additional coaching phase. An additional intervention package (i.e., strength-based video feedback plus additional coaching) was instituted for three of the parents (i.e., Atticus, Danny, and Daetreon) as they did not meet the predetermined criterion in the strength-based video feedback coaching phase. Visual analysis between the strength-based video feedback and additional coaching package intervention sessions varied. For Atticus and Danny, a variable but increasing trend in strategy use was observed. Daetreon's strategy use decreased in level, but stabilized from strength-based video feedback, and continued to remain above baseline levels. To supplement visual analysis, standardized mean difference and nonoverlap effect sizes were calculated. Large effects were found ( $ES = 2.294$ ) at the study level (i.e., between cases), and very large to moderate effects were calculated ( $M = 0.89$ , range 0.29–1.00) for nonoverlapping data, further supporting a functional relation between the initial intervention and parental NDBI strategy use.

These findings are consistent with previous research indicating that parents can be trained and coached via telepractice on NDBI strategies (Akemoglu et al., 2020; Meadan et al., 2016). Moreover, these results provide an additional contribution and extension to the literature of parent-implemented interventions: video feedback may be an effective coaching tool to use with parents when targeting the social communication skills of young children with ASD (Balldin et al., 2018; Ence, 2012; Phaneuf & McIntyre, 2007; Poslawsky et al., 2015).

### **Effects of Intervention on Child Social Communication**

Two basic effects (i.e., Jem and DJ) were identified between a one-hour parent training followed by strength-based video feedback coaching on child social communication. A standardized mean difference effect size (i.e., *scdhl*m) suggests small effects on child social communication, and nonoverlapping data effect size (i.e., *Tau-U*) found small to very large effects ( $M = 0.67$  [large effect], range - 0.24–1.00) on child social communication. Smaller and varied effect sizes are to be expected provided the cascading logical model associated with the current study (i.e., training the parent as the primary focus and expecting collateral effects to occur with the child as a result). In addition, the social communication learning targets varied from child to child based upon their skills, assessments, and IEP/IFSP goals. As such, the specifically selected child behaviors were individualized for each tier (see Table 3), which introduced limitations in comparison of effects on social communication skills across cases.

Low levels of child social communication were observed in baseline for three children (i.e., Jem, DJ, and Bailey). One child, Adrian, did not demonstrate any social communication on three baseline sessions due to the limited availability to his AAC system. Harry engaged in high levels of social communication with high levels of variability in baseline. This may have been due to the prompts (e.g., “Can you say, ‘red?’”) and intraverbal responses (e.g., Mom saying,

“Ready, set...” and Harry saying, “go!”) that were prompted with his mother, Diana. Upon visual inspection of child social communication data within the strength-based video feedback coaching phase, a clear change in level is present in two of the five children (i.e., Jem, DJ). Thus, there is no functional relation between the baseline and first intervention phases. Bailey’s social communication levels in intervention were variable and overlapped with his baseline levels of social communication. Harry’s frequency of social communication upon entering intervention decreased from baseline. As outlined above, this decrease may have been due to changes within his mother’s behavior, by adjusting from a more parent-led play session (e.g., quiz questions) to a child-led play sessions (e.g., Diana followed Harry to a new activity and modeled language as opposed to holding an item in sight but out of reach with a request to label the item multiple times before Harry would receive it). Child social communication remained relatively consistent in level with a slight increasing trend in two of the three children (i.e., Jem and DJ) from the strength-based video feedback coaching phase to the additional coaching phase. Adrian’s social communication levels remained above most of the baseline data but demonstrated high levels of variability. Consistent with visual analysis interpretations, a standardized effect size (i.e.,  $scd_{hlm}$ ) revealed a small effect on child social communication (effect size = 0.22) across cases, and Tau- $U$  effect sizes on child social communication were varied ( $M = 0.67$ , range -0.04–0.12). The differing levels of effects between the standardized mean difference and an averaged Tau- $U$  index indicate that there was little overlap between baseline and strength-based video feedback coaching on child social communication; however, there were small differences in the magnitude of effect (i.e., change in level) of the children’s social communication skills. This is consistent and complimented with visual analysis interpretations (e.g., two demonstrations of basic effects).

## **Parent Perception of Intervention**

All parents thought very highly of the feasibility and effectiveness of the intervention overall. The highest rating (i.e., 5 out of 5) was provided by all parents for the strategy Model Language. This is consistent with the quantitative data, as Model Language was the most used strategy for all parents during the intervention. One to two parents provided a rating lower than five for each of the other strategies. Atticus rated Reward and Expand a four out of five. Danny rated Arrange Environment and Follow and Imitate a four out of five. Meredith rated Arrange Environment a two out of five and Wait Time a three out of five. Daetreon and Diana provided the highest rating for all strategies. These differing perspectives align with best practices that recommend individualizing instruction, practices, and learning targets for each parent and child's needs (Bruinsma et al. 2020; DEC, 2014).

When parents were asked if there was any additional information the parent wanted to share, Diana provided an insight into how the intervention may have had collateral effects on joint engagement between the parent-child dyads. Specifically, Diana shared that she became “more confident and comfortable when playing with” Harry. This is consistent with previous research that suggests parent-implemented ABA-based interventions may empower parents to feel more confident in working with their child and building the bond between the child and parent (Dillenburger et al., 2002; Turnbull & Turnbull, 2001).

## **Parent Self-Efficacy**

While exploratory in nature, the self-efficacy scale varied for all parents from pre- to post-intervention. No statistically significant change in self-efficacy was present for any of the parents. Similarly, there were no statistically significant differences between pre- and post-assessment scores for any of the 12 questions that were asked. This suggests that, despite the

current project being developed with empowerment-based principles in mind, there were no significant changes in parent self-efficacy.

In addition to the Likert-scale for the self-efficacy assessments, the qualitative additions from the parents warrant discussion. Atticus provided an insight into how it may be important to provide progress updates via graphical representations. As such, some parents may benefit from other variations of feedback, such as constructive feedback (Ovando, 1994). Danny commented on how the video feedback allowed him to hear DJ say word approximations that he did not know DJ was saying when the recording was taking place. Danny's comment is consistent with feedback other parents provided throughout the intervention (i.e., hearing their child say words or word approximations within the video feedback that they did not hear when playing in-the-moment). For example, during the weekly researcher-parent meeting after Session 15, Meredith heard her child say the words "squeeze" and "out" after she Modeled Language for each word. Despite her recognizing other communication attempts during that session (e.g., Bailey saying the letter name, "B"), the words "squeeze" and "out" were new words for Bailey. Therefore, Meredith was not anticipating her son saying some of the language she was modeling. This discussion suggests that video feedback may be an instructional media (e.g., seeing or hearing new social communication from the child) in addition to a valid coaching tool (i.e., tool to provide insight on parent strategy use) for parent-implemented interventions that target child social communication. Finally, Meredith's input on the "utter joy and delight on [Bailey's] face" suggests that the children may have also enjoyed the change in their parent's strategy usage. This concept would align with the reasoning behind some of the targeted strategies, as they target joint engagement (i.e., Follow and Imitate) in addition to building social communication skills (e.g., Model Language).

## Variability in Data

Variability was observed within and between each of the five parent-child dyads. There are several hypotheses as to why this variability occurred. First, variability in data is to be expected when interventions are embedded within naturalistic settings and routines. The current study trained natural change agents (i.e., the child's parent) to embed strategies into naturally occurring routines (i.e., play time). Because interactions during play time can be unpredictable, parents were expected to apply strategies within a dynamic interaction. Second, the parents and researcher developed a list of activities using a preference assessment. In other words, not every session involved the same toy sets or activities both between and across dyads. Therefore, play activities could have varied in the number of opportunities the parents had to incorporate the strategies, having a secondary effect on child social communication opportunities. Third, there were instances where more than one parent participated within the play time routine for Dyads 2, 4, and 5. For example, there were sessions with Dyad 2 (i.e., Danny and DJ) where DJ's mother and/or grandmother were within the area that the play session was occurring. Although DJ's other family members were embedding strategies, data were only collected on Danny's strategy use, as he was the primary contact and only parent consented to the study. Having additional family members embed the interventions can lead to greater increases in child social communication, however, these interactions limited the amount of time that the primary parent was able to embed the strategies. Finally, there were recordings and occasions where there were disruptions to the play session due to child challenging behavior, sibling interruptions, and activity set up requirements (e.g., pulling out a sensory barrel for the child to roll in). These disruptions limited the amount of time that the parent was able to embed strategies, as there were other more-pressing demands occurring within the 10-minute period.

### **Fidelity Concerns and Implication of AAC Devices on Strategy Use**

The low fidelity with Dyad 4 (i.e., Daetreon and Adrian) warrant discussion. Throughout baseline and both intervention sessions, Daetreon demonstrated low-levels of fidelity (range 33%-75%). In addition, several videos were uploaded that did not align with the preference assessment (e.g., grocery shopping) or time request (i.e., 10-minute videos). Each week the researcher requested that Daetreon adhere to the lists of activities developed within the preference assessment as well as the laminated list of procedures that were provided. The researcher offered a new copy of the procedures, but Daetreon declined and shared that he would follow the procedures. The specific items on the fidelity checklist that Daetreon did not complete were (a) setting a timer, (b) watching video feedback, and (c) reviewing his weekly goal prior to play time. As a result, Daetreon did not receive as much coaching via video feedback and goal setting as the other parents did. It is not clear if Daetreon reviewed the video feedback prior to beginning the recording. However, Daetreon did view video feedback at least once each week as the researcher shared her screen to display new video feedback during each parent-researcher weekly meeting throughout intervention. It is important to consider that lower fidelity with this dyad may have been due to the added demands that families of young children who use AAC often experience (Goldbart & Marshall, 2004; McNaughton et al., 2008).

Daetreon's child, Adrian, used AAC to communicate. Parents of individuals who use AAC have voiced challenges in supporting the ongoing use of the AAC device during daily activities. For example, communicating with an AAC device requires additional effort to operate the communication system when compared to vocal speech (McNaughton et al., 2008). As demonstrated with the four other dyads that targeted unaided modes of communication (i.e.,

gestures and vocal speech), there was a much smaller magnitude in change in parent strategy usage between baseline and the strength-based video feedback coaching phase.

There are many hypotheses as to why there was a smaller change in magnitude for Daetreon's strategy use. First, additional time was required when communicating with his son, who used AAC as his primary mode of communication. Because the AAC system that Adrian used was not embedded within the play activity (e.g., video visual scene display), there were increased demands on both Daetreon and Adrian to hold joint attention throughout the play sessions (Beukelman & Light, 2020). For example, Adrian was required to hold joint attention between the AAC device, communication partner (i.e., father), and the play activity. Other children in the present study, were only required to hold joint attention between the parent and play activity. Therefore, it may be that parent-child dyads that include a child who uses AAC may require a simpler set of strategies (e.g., three strategies rather than five), different training and coaching style (e.g., in-the-moment training), or alternative practice modes (i.e., in-person or hybrid training and coaching).

Adrian required additional time to respond to his parent when compared to the other four children who used unaided modes of communication (Beukelman & Light, 2020). Adrian often navigated multiple pages on his AAC device before finding the correct icon to activate, or he spelled out what he was trying to say (e.g., "a-l-l- d-o-n-e"). As a result, Daetreon spent more time waiting on a response from his child when compared to other parents. Unfortunately, Wait Time was not counted in an interval unless (a) the strategy followed one of the antecedent strategies (i.e., Follow & Imitate, Arrange Environment, Model Language) and (b) the parent remained silent. Daetreon often repeated the question multiple times while his son, Adrian, was creating his message (i.e., Wait Time was not always present). Given the fidelity concerns, and

additional demands parents and children experience when an AAC system is involved, Daetreon and Adrian's should be interpreted with caution.

## **Implications for Research and Practice**

### ***Research***

There are several implications worthy of discussion as it relates to the current literature base. The large effect sizes indicate are strong effects of the intervention on parent strategy use. This is consistent with literature on parent-implemented NDBIs that target social communication (Fuller & Kaiser, 2020; Hampton & Kaiser, 2016; Roberts & Kaiser, 2011). The current study extends the literature base and bridges research between the field of social work (Balldin et al. 2018) and special education through the evaluation of strength-based video feedback as a coaching tool on parent-implemented NDBIs.

The current study addressed two concerns related to the participants in most NDBI research. First, the present evaluation included three fathers (i.e., Atticus, Danny, and Daetreon). This extends the current literature base, as most research on parent-implemented NDBIs have included mothers (Akemoglu et al., 2020; Braunstein et al., 2013; Meadan et al., 2009). Second, several research teams have called upon future research to extend the racial and ethnic diversity of participants in NDBI research (Akemoglu & Meadan, 2018; Meadan et al., 2009; Rakap & Rakap, 2014; Robertson et al., 2017) as most research has included parents who do not have diverse backgrounds. The present study adds to this limited research base, as Daetreon and Adrian represented Hispanic and Asian backgrounds. Daetreon rated the intervention very highly, indicating that the play-based intervention was appropriate and fit within their cultural norms. However, considering the low procedural fidelity, additional research is greatly needed to

have a better understanding of how to embed culturally-responsive practices within coaching interventions.

### ***Practice***

Several practical implications are worthy of discussion. First, the present evaluation provides evidence to suggest that strength-based video feedback may be an effective tool that practitioners and clinicians can use to deliver ongoing coaching to parents without having to be within the home. Implications for this service delivery model may include increasing the number of parents and early interventionists can train and coach, potentially decreasing elongated waitlists. Also, this asynchronous coaching program may widen the number of natural change agents that the practitioner can coach, enabling the child to be able to generalize their social communication skills across people. For example, if one parent works in the daytime when the practitioner works with the child, the misalignment of schedules may prevent that parent from being able to receive coaching. Allowing individuals to capture interactions at a convenient time may allow for the practitioner to provide coaching to those who would otherwise be unable to meet with the practitioner (Simacek et al., 2020).

Additionally, strength-based video feedback coaching may be a tool to assist with fading of services. For example, if the parent and child are making adequate progress on annual goals, the practitioner or interventionist may transition services from in-person or synchronous meetings to asynchronous telepractice sessions. Relatedly, parents of children who receive consultation services, may be able to receive individualized coaching through the use of strength-based video feedback. This could possibly allow practitioners to continue services with the child by coaching a natural change agent who is present throughout the child's day (e.g., parent, caregiver).

Finally, as indicated in the open-ended responses from the parents, strength-based video feedback coaching may provide parents with more insight into the interaction between them and their child. When in-the-moment, parents may be so focused on the strategies, that they miss some of the social communication that their child exhibits. Therefore, video feedback may serve as an instructional tool by highlighting child social communication that was unheard or seen by the parent in-the-moment. This instruction would reveal missed opportunities potentially leading to the parent being able to reinforce more communication attempts (i.e., communication that was unrecognized previously) in future interactions.

### **Limitations and Future Research Directions**

Several limitations in the study warrant discussion. First, the study evaluated the effects of strength-based video feedback immediately following training. Therefore, it is unclear how effective strength-based video feedback is in isolation from instruction. Future research may seek to incorporate strength-based video feedback coaching into preexisting coaching sessions to evaluate the effectiveness of video feedback as a coaching tool when removed from any additional instruction.

Second, Daetreeon displayed low levels of fidelity despite efforts and supports from the researcher. As such, Daetreeon and Adrian's data should be evaluated with caution. Two major areas warrant further investigation: (a) parent-implemented NDBI trainings for parents of children who use AAC, and (b) parent-implemented NDBI trainings for diverse families. Current research in these areas is limited. Future research may seek to understand if robust multi-step trainings (e.g., training on Modeling Language, Following and Imitating, Arranging the Environment, Wait Time, and Rewarding and Expanding) is appropriate for families with additional demands placed upon social interactions with their child. In addition, future research

should explore how various interventions and coaching styles should be adjusted for parents and children from diverse backgrounds or for children who use AAC. For example, researchers may seek to evaluate (a) how practitioners are using culturally responsive training and coaching styles, and/or (b) what coaching strategies are most effective for various individuals from diverse backgrounds.

Third, parent data were collected using 10-second partial interval recording. This type of data collection can potentially overestimate data (Green et al., 1982), as one strategy could be implemented every 10-seconds for the duration of the play session and the parent would have implemented strategies 100% of intervals. Although this error was accounted for with a decision rule (i.e., if parents did not implement a particular strategy at all or only focused on one strategy, then they entered the additional coaching package) and did not have to be utilized in the current study, data should be interpreted with caution. Future research may wish to apply multiple data collection methods (e.g., frequency, rate) to parent-implemented interventions to understand the implications of data collection modes.

Fourth, generalization data were not collected. Despite having multiple different play activities to choose from, the current study did not explicitly evaluate how the intervention could be embedded within other naturally occurring routines (e.g., bedtime routines) nor did the study evaluate the effects of training one parent on the implementation of strategies for another family member (i.e., generalization to other interventionists). Yet, Danny, Daetreon, and Diana mentioned other family members had taken up the strategies in home (i.e., the child's mother and grandmother; the child's mother; and the child's husband, respectively). This anecdotal insight suggests that there may be a cascading impact of training a parent on the family system. In other words, if one family member is trained and coached by a professional, it may be likely that other

family members will observe and begin implementing the strategy as well. Future research may seek to evaluate how a parent-implemented play-based intervention can generalize to other settings (e.g., playdates with peers), routines (e.g., bed time routines), and family members (e.g., parent, sibling).

Finally, it is critical that future research evaluate the effects of (a) training practitioners to implement NDBI strategies within their intervention practices, and (b) training practitioners to provide video feedback coaching to parents and caregivers as a coaching tool. This step toward implementation science will be pivotal to understanding how the current research project can translate from research to practical services.

### **Concluding Remarks**

In sum, the current study evaluated the effects of a telepractice-based parent-implemented intervention that utilized strength-based video feedback coaching and an additional coaching package through a concurrent multiple-baseline single case design across five parents of young children with ASD. Visual analysis, supplemented with standardized mean difference and nonoverlap analyses, revealed a functional relation and large effects for parent strategy use. No function relation was present for child social communication. This is to be expected, given the cascading logic model of targeting parent behavior change on child behavior. Given the promising strength of evidence for incorporating strength-based video feedback as a coaching tool within parent-implemented NDBIs, the current study provides insight to inform future research and practice.

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APPENDIX A  
RECRUITMENT FLYER

## LET'S LEARN AND PLAY!

Seeking parents of young children with autism to participate in an online training and coaching study!



We are inviting parents of children with autism to participate in online training and coaching sessions to support their child's communication skills during play-based activities!

### WHO?

- Parents 18 years or older who reside in the U.S.
- Children ages 2 – 5 with autism and a language delay who use less than 50 spoken words

### WHAT?

- Individualized training and one-on-one online coaching sessions on research-based strategies

For more information, please contact the head of the research study:

Ciara Ousley

E-mail: [CU54@psu.edu](mailto:CU54@psu.edu)

Text/Call: 602-516-6609



*This study has been approved by Penn State University. Ciara Ousley is a certified special education teacher and a doctoral student in Special Education who is working with Dr. Tracy Raulston (Penn State University). This research study is funded by The Organization of Autism Research's Graduate Research Grant.*

**APPENDIX B**

**PARENT BEHAVIOR DATA COLLECTION SHEETS**

**Parent Data Collection Sheet**

Participant code: \_\_\_\_\_ Coder: \_\_\_\_ Primary or IOA (*circle one*) | Probe: \_\_\_\_\_ Week/Session #: \_\_\_\_\_ Routine: \_\_\_\_\_

	0 - 10s	11 - 20s	21 - 30s	31 - 40s	41 - 50s	51 - 60s
1 min	F/I EA M W R/E					
2 min	F/I EA M W R/E					
3 min	F/I EA M W R/E					
4 min	F/I EA M W R/E					
5 min	F/I EA M W R/E					
6 min	F/I EA M W R/E					
7 min	F/I EA M W R/E					
8 min	F/I EA M W R/E					
9 min	F/I EA M W R/E					
10 min	F/I EA M W R/E					

	F/I	EA	M	W	R/E
<b>Total # intervals</b>					
<b>% of intervals w strategy</b> <small>(Total above / 60) x 100</small>					
<b>Total # intervals w strategies</b>	_____		<b>% of intervals w strategies</b>	_____ / (60) x 100 = _____	

## APPENDIX C

## CHILD BEHAVIOR DATA COLLECTION SHEETS

## Child Data Collection Sheet

Coder: \_\_\_\_\_ Primary or IOA (*circle one*) Probe: \_\_\_\_\_ Week/Session #: \_\_\_\_\_ Routine: \_\_\_\_\_

	Timestamp	Child Communication	Prompt Level
1			Independent Echoic
2			Independent Echoic
3			Independent Echoic
4			Independent Echoic
5			Independent Echoic
6			Independent Echoic
7			Independent Echoic
8			Independent Echoic
9			Independent Echoic
10			Independent Echoic
11			Independent Echoic
12			Independent Echoic
13			Independent Echoic
14			Independent Echoic
15			Independent Echoic
16			Independent Echoic
17			Independent Echoic
18			Independent Echoic
19			Independent Echoic
20			Independent Echoic

Total # of target communication	Sum of all target communication
Independent: _____ Echoic: _____	_____

## APPENDIX D

### SCREENING SCRIPT

Participant Code: \_\_\_\_\_

Hi, <insert parent name>. Thank you for calling. I understand you saw my flyer and are interested in participating in the study on a training to help build your child's communication skills?

1. "Do you feel comfortable speaking and reading text in English?"
  - a. If yes, move on to question 2
  - b. If no, "I understand. Thank you for your time today"
  
2. "Are you 18 years of age or older?"
  - a. If Yes, move onto question #3
  - b. If No, say, "This study is for parents 18 years of age or older. Thank you for your time today."
  
3. "Do you reside in the United States of America?"
  - a. If Yes, move onto question #4
  - b. If No, say, "This study is for individuals who reside in the United States. Thank you for your time today."
  
4. "Is your child diagnosed with autism and have difficulties with communication?"
  - a. If Yes, ask for diagnosis and origin of diagnosis (e.g., medical doctor, IQ test) and move onto question #5
  - b. If No, say, "This study is focused on parents of children with autism. Thank you for your time today."
  
5. "Is your child between the ages of 2 – 5 years old?"
  - a. If Yes, move onto question #6
  - b. If No, say, "This study is for young children. Thank you for your time today."
  
6. "Does your child have significant behavioral challenges such as frequent daily aggression?"
  - a. If Yes, say "This focus of this study is on communication skills during naturally occurring routines with parents. If your child is currently engaging in high levels of serious challenging behavior, this is not the best study right now. Would you like to be contacted in the future for studies focused on challenging behavior?"
    - i. If Yes, "Let me get your contact information. I will keep your information in a password protected file and contact you in the future for studies that may be of interest to you."
    - ii. If No, "I certainly understand. Thank you for your time today."
  - b. If No, move onto question #7

7. "Does your child experience difficulty holding a conversation with you during regular routines such as play?
  - a. If Yes, move onto question #8
  - b. If No, say, "The purpose of this study is to teach these skills to children with disabilities how to have more conversations during routines, such as play. It sounds like your child is already doing that, so this study may not be the best fit right now. Thank you for your time"
  
8. "Does your child say between 10 and 50 words/signs/AAC easily understandable by others?
  - a. If Yes, move to question #9
  - b. If no, say, "The purpose of this study is to increase the language skills of children with less than 50 words, if your child is still working on this may not be the best study right now. Would you like to be contacted in the future for studies for children with other communication disabilities?"
    - i. If Yes, "Let me get your contact information. I will keep your information in a password protected file and contact you in the future for studies that may be of interest to you."
    - ii. If No, "I certainly understand. Thank you for your time today."
  
9. "Is your child able to play with you or engage with you during routines such as meal time? "
  - a. If Yes, move to question #10
  - b. If no, say, "I understand. A key part of this study is to teach you various strategies to get your child to communicate with you more. Thank you for your time"
  
10. "Is your child's hearing within a normal range?
  - a. If yes, move on to question 11
  - b. If no, "I understand. Unfortunately, your child does not qualify for the current study. Thank you for your time today"
  
11. Would you be able to meet with me 1 times per week and capture two 10-minute play sessions between you and your child?
  - a. If Yes, say "It sounds like your child does qualify. Next, I will need to schedule a time to obtain consent for you to participate and to complete some assessments. These assessments will help me collect data on your family demographics, your child's adaptive skills (which are things like communication, independence level, etc.), disability characteristics, and your family preferences (e.g., activities you enjoy as a family). What dates/times would work for you?"
  - b. If no, say, "I understand. A key part of this study is coaching parents once a week by using parent-recorded videos during playtime.. Thank you for your time"

## APPENDIX E

## DEMOGRAPHIC QUESTIONNAIRE

NDBI Parent Training - Telehealth  
 Protocol #00015925  
 Caregiver and Family Demographics Questionnaire

Participant code: \_\_\_\_\_

Date: \_\_\_\_\_

**A Little About You**

What is your Date of Birth? Please write in using numbers.

\_\_\_\_ - \_\_\_\_ - \_\_\_\_  
 Month      Day      Year

What is your sex? Circle **one**.      Male    Female

What is your race/ethnicity? Select **all** that apply.

- White/Caucasian
- Black/African American
- Hispanic/Latino
- Asian
- Native American
- Pacific Islander
- Other: \_\_\_\_\_

What is the last level of formal education you completed? Select **one**.

- No formal schooling
- 7<sup>th</sup> grade or less
- Junior high completed
- Partial high school (at least one year)
- High school graduate/GED certificate
- Partial college (at least one year)
- Specialized training
- Junior college/Associates degree (2 years)
- Standard college or university graduation (4 years)
- Graduate professional training, graduate degree

What is your employment status? Select *one*.

- Self-employed
- Full time employment
- Part time employment
- Seasonal
- Unemployed
- Disabled
- Temporary layoff
- Full time homemaker
- Student (not working)
- Other (describe): \_\_\_\_\_

### **Household Income Information**

---

What is your annual household income (including all sources) ? Select *one*.

- \$4,999 or less
- \$5,000 to \$9,999
- \$10,000 to \$14,999
- \$15,000 to \$19,999
- \$20,000 to \$24,999
- \$25,000 to \$29,999
- \$30,000 to \$39,999
- \$40,000 to \$49,999
- \$50,000 to \$59,999
- \$60,000 to \$69,999
- \$70,000 to \$79,999
- \$80,000 to \$89,999
- \$90,000 or more

### **A Little more about Your Child**

---

What is your child's sex? Circle *one*.      Male    Female

What is your child's age? \_\_\_\_\_

What is your child's race/ethnicity? Select *all* that apply.

- White/Caucasian
- Black/African American

- Hispanic/Latino
- Asian
- Native American
- Pacific Islander
  
- Other: \_\_\_\_\_

What is your child’s diagnosis? Select *all* that apply.

- Autism Spectrum Disorder
- Developmental Delay
- Speech-language Impairment
- Intellectual Disability
- Down Syndrome

Other: \_\_\_\_\_

When was your child identified as having the previously identified disability?

- At birth or infancy (0 – 11 months)
- One-year old (12 – 23 months)
- Two years old (24 – 35 months)
- Three years old (36 – 47 months)
- Four years old (48 – 59 months)
- Five years old (60 – 71 months)

Other/unknown: \_\_\_\_\_

Who diagnosed your child?

- Primary Care Physician/Pediatrician
- Other Physician/Specialist (e.g., neurologist, psychiatrist, other specialist)
- Psychologist (e.g., school psychologist)
- Social Worker
- Unknown

Other: \_\_\_\_\_

Please list any other educational/behavioral support services your child is receiving during this study (including any other research studies):

---

–

---

–

**About Your Family**

How many individuals live in your home? \_\_\_\_\_

Please share who those individuals are in relation to the child (e.g., sister, uncle):

\_\_\_\_\_

–

\_\_\_\_\_

–

Location of your family (city, state; rural, urban): \_\_\_\_\_

How has COVID-19 impacted your you and/or your child?

- Financial hardship
- Termination of services
- Services lessened in quality
- Services lessened in quantity
- New behaviors established (e.g., challenging behavior)

Other: \_\_\_\_\_

Please explain any of the information above:

\_\_\_\_\_

–

\_\_\_\_\_

–

On a scale of 1 – 5, how confident are you in supporting your child's communication?

- 1: Strongly not confident
- 2: Not confident
- 3: Somewhat confident
- 4: Confident
- 5: Very Confident

Please explain any of the information above:

\_\_\_\_\_

–

\_\_\_\_\_

**APPENDIX F**  
**INDIRECT PREFERENCE ASSESSMENT**

**Reinforcement Survey**

Participant Code \_\_\_\_\_ Date \_\_\_\_\_

Completed by \_\_\_\_\_

Edibles	Really Like A LOT	It is OKAY	Does NOT like at all	Do not know
<b>EX. Ice Cream chocolate</b>	<b>X</b>			
Ice Cream				
Juice				
Fruit				
Raisins				
Chips				
Crackers				
Cookies				
Popcorn				
Peanuts				
Pretzels				
Gum				
Chocolate				
Soda				
Other:				
Other:				
Tangibles	Really Like A LOT	It is OKAY	Does NOT like at all	Do not know
<b>EX. Games Connect Four</b>	<b>X</b>			
Games				
Puzzles				
Cars				
Trains				
Airplanes				
Dolls				
Balls				

Books				
Stickers				
Animals				
Comics				
Magazines				
Balloons				
Bubbles				
Sensory bins				
Other:				
Other:				
<b>Activities</b>	<b>Really Like A LOT</b>	<b>It is OKAY</b>	<b>Does NOT like at all</b>	<b>Do not know</b>
<b>EX. Games</b> <b>Playing</b>	<b>X</b>			
<b>with my sister</b>				
Baseball				
Bowling				
Taking a walk				
<u>Play-doh</u>				
Drawing				
Coloring				
Cutting/Pasting				
Painting				
Spending time with a friend				
Spending time with an adult				
Computer/iPad				
Video Games				
Watching TV				
Renting Movies				
Going to Movies				
Listening to Music				
Going to Park				
Singing				
Taking care of animals				

Other:				
<b>Activities</b>	<b>Really Like A LOT</b>	<b>It is OKAY</b>	<b>Does NOT like at all</b>	<b>Do not know</b>
Dancing				
Bouncing on ball				
Riding a bike				
Run an errand for parent				
Go to library				
Write on Chalkboard/Dry Erase				
Go to <u>friends</u> house				
Invite a friend to my house				
Other:				
Other:				

## APPENDIX G

### PARENT SELF-EFFICACY SCALE

#### Autism-Specific Parenting Self-Efficacy Scale– Adapted for Social Communication

(Kurzrok, McBride, & Grossman, 2021)

Please rate the extent to which you agree or disagree with each of the following statements.

Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
1	2	3	4	5

- |  |                  |
|--|------------------|
| <p>1. I feel confident that I understand the elements of an ASD diagnosis and how that diagnosis relates to my child's social communication.</p>   | <p>1 2 3 4 5</p> |
| <p>2. I feel I am able to actively participate in my child's social communication therapy program. (for example: open to trying new things, willing to jump in when asked by the therapist, comfortable participating in activities and modeling for child)</p>  | <p>1 2 3 4 5</p> |
| <p>3. I feel confident that I can seek additional resources on social communication beyond what is provided to me. (for example: interventions beyond what the school provides, additional sources of information or support)</p>  | <p>1 2 3 4 5</p> |
| <p>4. I feel confident that I understand the social communication goals and process of my child's intervention(s). (for example: understanding and prioritizing therapy goals, recognizing my child's strengths and weaknesses, assessing when progress has been achieved)</p>   | <p>1 2 3 4 5</p> |
| <p>5. I feel confident that I can incorporate aspects of my child's social communication intervention(s) at home. (for example: make accommodations in my home, adapt my lifestyle, complete therapy "homework")</p>   | <p>1 2 3 4 5</p> |
| <p>6. I am confident that I can put things into a realistic perspective as I raise my child with ASD. (for example: recognize my own strengths and limitations as a parent, understand that bad days don't imply bad parenting, know that I will learn from experience, know when I need more information or help)</p> | <p>1 2 3 4 5</p> |

- |  |           |
|--|-----------|
| 7. I feel confident that I can accept both my child's social communication strengths and weaknesses as they pertain to their ASD diagnosis.  | 1 2 3 4 5 |
| 8. I am confident that I can advocate for my priorities when speaking with professionals. (for example: ask questions, voice my opinion, advocate or contribute at IEP meetings)   | 1 2 3 4 5 |
| 9. I am confident that I can make realistic assessments of what will benefit my child most. (for example: prioritize resources, prioritize time, prioritize my child's needs within the context of the entire family)  | 1 2 3 4 5 |
| 10. I feel confident that I can navigate communication with my child's intervention team. (for example: effectively communicate with a variety of different professionals, manage communication between my child's home, school, and independent interventionists)                       | 1 2 3 4 5 |
| 11. I feel confident that I can handle difficult moments with my child when it comes to social communication. (for example: support my child when the predictable routine changes, make things fun even when they are unexpected, navigate major transitions in interventions or school) | 1 2 3 4 5 |
| 12. I feel confident that I have skills or qualities necessary to connect with my child with ASD.  | 1 2 3 4 5 |

Optional response question: Tell us about one memorable experience you have had while interacting with your child during this intervention program that has influenced your confidence in your own parenting skills

## APPENDIX H

## RESEARCHER FIDELITY CHECKLIST FOR BASELINE

<b>Video Feedback Coaching Meeting Fidelity Checklist</b>		
Parent Coaching Study (PCS)		
Participant Code: _____ Coder: _____ Date Coded: _____		
Step	Step	Occurrence?
1	Researcher greets/checks-in with parent to ask how they're doing.	Y    N
2	Researcher states if videos were received or not and provides feedback on capturing of video if needed (e.g., couldn't hear, etc.).	Y    N
3	Researcher reminds parents to delete previous videos from tablet if applicable (if using Zoom, not applicable).	Y    N
4	Researcher reminds parent to follow the procedures on the yellow sheet.	Y    N
5	Researcher reminds parent to record 3 times, with each session being 10 minutes each.	Y    N
6	Researcher asks if parent has any questions.	Y    N
7	Researcher verifies next meeting date.	Y    N
<b>Training Fidelity Score = (# Steps Correct) / 7 * 100</b>		_____

## APPENDIX I

## PARENT PROCEDURAL CHECKLIST FOR PROBES IN BASELINE

Parent Procedural Fidelity (Baseline and Maintenance)		
Participant Code: _____ Coder: _____ Date Coded: _____		
	Step	Occurrence?
1	Parent verifies that parent and child are within the video frame.	Y    N
2	Parent sets timer for 10 minutes	Y    N
3	Parent plays with child and attempts to keep parent and child within video frame for 10 minutes (do not have to be in the frame the entire time)	Y    N
Training Fidelity Score = [ (# Steps Correct) / 3 ] x 100		_____

## APPENDIX J

## RESEARCHER FIDELITY CHECKLIST FOR PARENT TRAINING

<b>Training Fidelity Checklist</b>		
Participant Code: _____ Coder: _____ Date Coded: _____		
	Step	Occurrence?
1	Researcher tells parent today will be a training on various strategies.	Y N
2	Researcher tells parent that they can open envelope with Phase 2 materials.	Y N
3	Researcher asks parent if they have any questions (and answers them) before beginning.	Y N
4	Researcher shares screen with PowerPoint and reviews why these strategies are important, providing an example relevant to parent-child dyad via a 3-term contingency.	Y N
5	Researcher discusses communication target for the child.	Y N
6	Researcher shares all strategies and states that the figure is the same as what can be found in the envelope labeled "Phase 2 Materials"	Y N
7	Researcher explains <i>Model Language and Play</i> and provides an example relevant to parent-child dyad.	Y N
8	Researcher and parents discuss together more examples of how to incorporate <i>Model Language and Play</i> into play sessions with toys the child plays with, with researcher typing into an arrow with examples	Y N
9	Researcher explains <i>Follow &amp; Imitate Child's Play</i> and provides an example relevant to parent-child dyad.	Y N
10	Researcher and parents discuss together more examples of how to incorporate <i>Follow &amp; Imitate Child's Play</i> into play sessions with toys the child plays with, with researcher typing into an arrow with examples	Y N
11	Researcher explains <i>Arrange the Environment</i> and provides an example relevant to parent-child dyad.	Y N
12	Researcher and parents discuss together more examples of how to incorporate <i>Arrange the Environment</i> into play sessions with toys the child plays with, with researcher typing into an arrow with examples	Y N
13	Researcher explains <i>Wait Time</i> and provides an example relevant to parent-child dyad.	Y N
14	Researcher explains <i>Reward &amp; Expand Communication</i> and provides an example relevant to parent-child dyad.	Y N
15	Researcher shows a video with multiple strategies performed.	Y N
16	Researcher asks parent if there are any questions.	Y N
17	Researcher and parent engage in role play activity, talking through how to incorporate all strategies within a play session with their child.	Y N
18	Researcher shares first video feedback with parent	Y N
<b>Training Fidelity Score = (# Steps Correct) / 17 * 100</b>		_____

## APPENDIX K

**RESEARCHER FIDELITY CHECKLIST FOR STRENGTH-BASED VIDEO  
FEEDBACK COACHING SESSIONS**

<b>Video Feedback Coaching Meeting Fidelity Checklist</b>		
Parent Coaching Study (PCS)		
Participant Code: _____ Coder: _____ Date Coded: _____		
Step	Step	Occurrence?
1	Researcher greets/checks-in with parent to ask how they're doing.	Y    N
2	Researcher asks parent if everything went smoothly this past week.	Y    N
3	Researcher notifies parent if she received the videos or not and any guidance on how to better capture video (if needed)	Y    N
4	Researcher provides praise for the previous week and highlights an example of a great interaction.	Y    N
5	Researcher asks if the parent had any lingering questions from the previous week.	Y    N
6	Researcher shares screen with the parent and shows the visual arrow to highlight the 5 strategies.	Y    N
7	Researcher shows parent video feedback from previous week's recordings with 3 great examples	Y    N
8	Researcher asks if parent has any questions.	Y    N
9	Researcher tells parent how many videos to capture for the week and requests that the parent follows the procedures	Y    N
10	Researcher reminds parent to watch the new video feedback prior to play recordings.	Y    N
11	Researcher verifies next meeting date.	Y    N
<b>Training Fidelity Score = (# Steps Correct) / 11 * 100</b>		_____



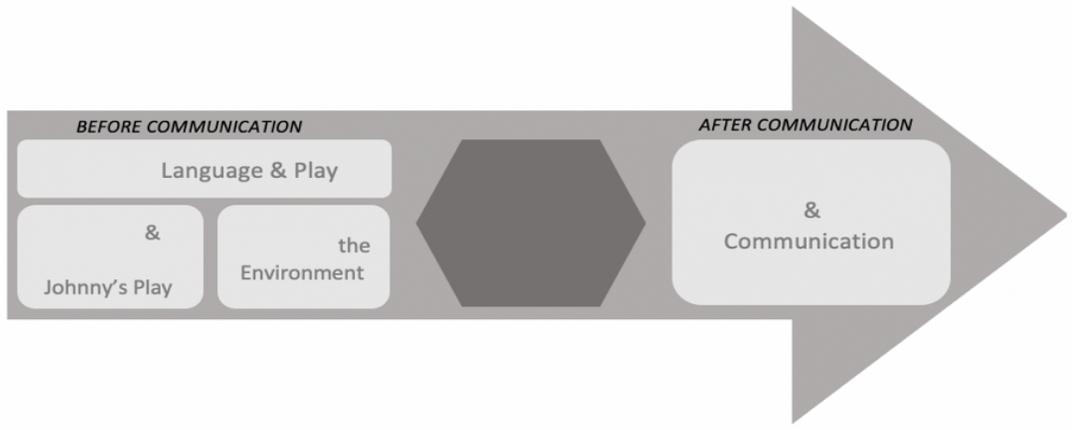
**APPENDIX M**

**SAMPLE PARENT REFLECTION JOURNAL SHEET**

**Reflection and goal setting**

Date: \_\_\_\_\_

<b>PLANNING</b>	
Goal(s):	Tips:



<b>REFLECTION 1</b>	
What went well?	What was hard?

<b>REFLECTION 2</b>	
What went well?	What was hard?

<b>WEEKLY REFLECTION</b>	
What went well?	What was hard?

## APPENDIX N

## RESEARCHER FIDELITY CHECKLIST FOR ADDITIONAL COACHING SESSIONS

## Video Feedback Coaching Meeting Fidelity Checklist

Parent Coaching Study (PCS)

Participant Code: \_\_\_\_\_ Coder: \_\_\_\_\_ Date Coded: \_\_\_\_\_

Step		Occurrence?	
1	Researcher greets/checks-in with parent to ask how they're doing.	Y	N
2	Researcher asks parent if everything went smoothly this past week.	Y	N
3	Researcher notifies parent if she received the videos or not and any guidance on how to better capture video (if needed)	Y	N
4	Researcher provides praise for the previous week and highlights an example of a great interaction.	Y	N
5	Researcher asks if the parent had any lingering questions from the previous week.	Y	N
6	Review/discuss session #1	Y	N
7	Review/discuss session #2	Y	N
8	Review/discuss session #3 (if applicable)	Y	N
9	Develop goal together for parent to focus on	Y	N
10	Discussion-based role play with goal	Y	N
11	Researcher shares screen with the parent and shows the visual arrow to highlight the 5 strategies.	Y	N
12	Researcher shows parent video feedback from previous week's recordings with 3 great examples	Y	N
13	Researcher asks if parent has any questions.	Y	N
14	Researcher tells parent how many videos to capture for the week and requests that the parent follows the procedures	Y	N
15	Researcher reminds parent to watch the new video feedback prior to play recordings.	Y	N
16	Researcher verifies next meeting date.	Y	N
<b>Training Fidelity Score = (# Steps Correct) / 15 or 16 * 100</b>		_____	

## APPENDIX O

## PARENT FIDELITY CHECKLIST FOR ADDITIONAL COACHING SESSIONS

Parent Procedural Fidelity (C Phase)		
Participant Code: _____ Coder: _____ Date Coded: _____		
	Step	Occurrence?
1	Parent verifies that parent and child are within the video frame.	Y    N
2	Parent watched video feedback.	Y    N
3	Parent reviewed goal.	Y    N
4	Parent sets timer for 10 minutes	Y    N
5	Parent plays with child and attempts to keep parent and child within video frame for 10 minutes	Y    N
<b>Parent Procedural Fidelity = [ (# Steps Correct) / 5 ] x 100</b> _____		

**APPENDIX P**

**PARENT SOCIAL VALIDITY QUESTIONNAIRE**

<b>Social Validity Questionnaire</b> <b>Ciara's Parent Coaching Study</b>				
<i>Please score each item by stating the number that best indicates how you feel about the play-based intervention.</i>				
1. How acceptable did you find the play-based intervention?				
1	2	3	4	5
Not at all acceptable		Neutral		Very acceptable
2. How willing were you to carry out the strategies in the intervention?				
1	2	3	4	5
Not at all willing		Neutral		Very willing
3. To what extent do you think there might have been disadvantages in following the intervention?				
1	2	3	4	5
None likely		Neutral		Many likely
4. How confident are you that the intervention was effective for your child?				
1	2	3	4	5
Not at all confident		Neutral		Very confident
5. How likely is this intervention to make permanent improvements in your child's communication abilities?				
1	2	3	4	5
Unlikely		Neutral		Very likely
6. How disruptive was it to carry out this intervention?				

1	2	3	4	5
Not at all disruptive		Neutral	Very disruptive	
7. How willing were other family members to help carry out this intervention? <i>(If applicable, who? If not applicable, please skip):</i>				
1	2	3	4	5
Not at all willing		Neutral	Very willing	
8. To what extent did you notice undesirable side-effects from this intervention?				
1	2	3	4	5
No side effects likely		Neutral	Many side effects likely	
9. How much discomfort did your child experience during this intervention?				
1	2	3	4	5
No discomfort at all		Neutral	A lot of discomfort	
10. How willing would you be to change your routines to continue to carry out this intervention at home?				
1	2	3	4	5
Not at all willing		Neutral	Very willing	
11. How well will carrying out this intervention fit into your existing play time routines?				
1	2	3	4	5
Not at all		Neutral	Very well	
12. How well did the goal of the intervention fit with your goals for your child?				

1	2	3	4	5
Not at all		Neutral		Very much
13. How effective was the intervention in teaching you how to communicate with your child?				
1	2	3	4	5
Not at all effective effective		Neutral		Very
14. What is the likelihood that you will continue using the strategies?				
1	2	3	4	5
Unlikely likely		Neutral		Very
<i>Please rate your feelings about the <b>specific components</b> of the intervention.</i>				
<i>Training and Coaching Procedures:</i>				
<b>1-hour Training (PowerPoint with examples with your child's toys)</b>				
1	2	3	4	5
Did not like much at all		Neutral		Like it very
<b>Visual Arrow with Examples of How to Use the Strategies</b>				
1	2	3	4	5
Did not like at all		Neutral		Like it very much
<b>Video Feedback</b>				
1	2	3	4	5
Did not like much at all		Neutral		Like it very

**Self-Reflection Journal (If applicable)**

1	2	3	4	5
Did not like much at all		Neutral		Like it very

**Capturing and Uploading Videos on Your Own Time (not having to log into Zoom)**

1	2	3	4	5
Did not like much at all		Neutral		Like it very

*Specific Strategies:*

**Model Language and Play**

1	2	3	4	5
Did not like much at all		Neutral		Like it very

**Follow and Imitate Your Child**

1	2	3	4	5
Did not like much at all		Neutral		Like it very

**Arrange Environment**

1	2	3	4	5
Did not like much at all		Neutral		Like it very

**Wait time**

1	2	3	4	5

Did not like much at all		Neutral		Like it very
<b>Reward and Expand Child Communication</b>				
1	2	3	4	5
Did not like much at all		Neutral		Like it very
<b>Please include any other comments:</b>				
<hr/>				

## ONE-PAGE SUMMARIZED CURRICULUM VITAE

### CIARA LYN OUSLEY

#### EDUCATION

---

- 2022 *Ph.D. Special Education*, The Pennsylvania State University  
Focuses: Applied Behavior Analysis and Augmentative and Alternative Communication
- 2017 *M.S. Special Education*, Saint Joseph's University  
Focus: Autism Spectrum Disorders
- 2015 *B.S. Education and Human Sciences*, The University of Nebraska – Lincoln  
Focus: Elementary Education and Special Education K-6

#### PROFESSIONAL EXPERIENCE

---

- 2022 *Adjunct Instructor*, Niagara University
- 2018-2022 *Graduate Research and Teaching Assistant*, The Pennsylvania State University
- 2016-2018 *Intervention Specialist Severe Disabilities*, Athens County Board of DD (Ohio)
- 2015-2016 *Special Education Inclusion Teacher*, Elkhorn Public Schools (Nebraska)

#### FUNDED GRANT

---

- 2021 *Coaching families of young children with autism and minimal speech in naturalistic developmental behavioral strategies using video feedback*. Graduate Research Grant, The Organization for Autism Research (\$2000)

#### SELECTED PUBLICATIONS (total $n = 10$ )

---

- Ousley, C., & Raulston, T. J.** (in press). A guide to incorporate augmentative and alternative communication into functional communication training. *Intervention in School and Clinic*.
- Coburn, K. L., Jung, S., **Ousley, C.**, Sowers, D.J., Wendelken, M., & Wilkinson, K. (2021). Centering the family in their system: A framework to promote family-centered AAC services. *Augmentative and Alternative Communication*.
- Ousley, C., & Raulston, T. J.** (Commentary authors, 2020). Preliminary evidence suggests that functional reinforcement contingencies may result in more rapid acquisition of initial auditory-visual discriminations for some individuals with autism spectrum disorder. *Evidence-Based Communication Assessment and Intervention*. 14 (3), 152-159.
- Ousley, C., Raulston, T. J., Gregori, E., McNaughton, D., Bhana, N., & Mantzoros, T.** (2020). A comparison of single-case quality evaluation tools applied to functional communication training with augmentative and alternative communication supports for students with developmental disabilities. *Research in Developmental Disabilities*. 107, 1 – 14.